Designation: ~~E1732 – 22~~ E1732 – 24

Standard Terminology Relating to Forensic Science[1]

This standard is issued under the fixed designation E1732; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

~~1.1 This terminology standard includes definitions of terms used in the forensic sciences.~~

~~1.2 Legal and scientific and terms in common use that are generally understood or defined adequately in other readily available sources may not be included, except when dictionaries show multiple definitions and it seems desirable to indicate the definitions recommended for forensic science use.~~

~~1.3 Section A defines terms that are common to multiple areas of forensic science, whereas, the subsequent sections define terms pertaining to specific forensic science areas, as follows:~~

~~**Section A: General (Common) Forensic Science Terms**~~
~~The terms defined in Section A are the direct responsibility of Subcommittee E30.92, Terminology.~~

~~**Section B: Criminalistics**~~
~~The terms defined in Section B are the direct responsibility of Subcommittee E30.01, Criminalistics.~~
~~Section B1: Terms for Seized Drug Analysis~~
~~Section B2: Terms for Gunshot Residue (GSR) Analysis and Smokeless Powder Analysis~~
~~Section B3: Terms for Paint Analysis~~
~~Section B4: Terms for Textile, Fiber, Cord, and Tape Examination~~
~~Section B5: Terms for Glass Examination~~
~~Section B6: Terms for Fire Debris~~

~~**Section C: Digital and Multimedia Evidence**~~
~~The terms defined in Section C are the direct responsibility of Subcommittee E30.12, Digital and Multimedia Evidence.~~
~~Section C1: Terms for Computer Forensics~~
~~Section C2: Terms for Digital Image Processing and Multimedia Evidence Examination~~
~~Section C3: Terms for Magnetic Card Reader Examination~~
~~Section C4: Terms for Facial Image Examination~~

~~**Section D: Interdisciplinary**~~
~~The terms defined in Section D are the direct responsibility of Subcommittee E30.11, Interdisciplinary Forensic Science Standards.~~

[1] This terminology is under the jurisdiction of ASTM Committee E30 on Forensic Sciences and is the direct responsibility of Subcommittee E30.92 on Terminology.
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Section E: Questioned Documents

The terms defined in Section E were formerly the direct responsibility of Subcommittee E30.02, Questioned Documents, and are currently the direct responsibility of Subcommittee E30.90, Executive Committee.

1.4 Entries listed in Sections B–E reflect only those existing in Committee E30 standards current with the date of a once yearly review of Committee E30 standards. Changes to standards or entries following this date will appear in Sections B–E after the following year's review date.

1.1 An alphabetical list of the terms defined in this standard is given in This terminology is the compilation of all terms used by Committee E30 on Forensic Sciences.Appendix X1, which also identifies the section(s) in which each term is defined.

1.1.1 This terminology consists mostly of definitions that are specific to forensic science and forensic practice. Meanings of the same terms used outside of forensic practice can be found in other compilations or dictionaries of general usage.

1.1.2 The specific E30 subcommittee (SC) that has responsibility for each term is the first attribution noted, in square brackets, after the definition. The designation of the standard(s) in which the terms appear is given after the subcommittee. The wording of an entry cannot be changed without approval per the Committee E30 Bylaws. Users of this compilation should also review any SC terminology standard for more details or interpretations of these terms and their use by the SC.

1.2 Definitions identical to those published by another standards-developing organization or ASTM committee are identified with the abbreviation of the name of the organization or the identifying document and ASTM committee; for example, ASME is the American Society of Mechanical Engineers.This terminology is a tool for managing the committee's terminology. This includes finding, eliminating, and preventing redundancies in which two or more terms relating the same concept are defined in different words.

1.7 In some cases different usage of a term in different fields has been noted.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C162 Terminology of Glass and Glass Products
D123 Terminology Relating to Textiles
D6161 Terminology Used for Microfiltration, Ultrafiltration, Nanofiltration, and Reverse Osmosis Membrane Processes
E131 Terminology Relating to Molecular Spectroscopy
E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods
E456 Terminology Relating to Quality and Statistics
E860 Practice for Examining and Preparing Items That Are or May Become Involved in Criminal or Civil Litigation
E1187 Terminology Relating to Conformity Assessment (Withdrawn 2006)[3]
E1301 Guide for Proficiency Testing by Interlaboratory Comparisons (Withdrawn 2012)[3]
E1402E1388 Guide for Sampling DesignPractice for Static Headspace Sampling of Vapors from Fire Debris Samples
E1412 Practice for Separation of Ignitable Liquid Residues from Fire Debris Samples by Passive Headspace Concentration with Activated Charcoal
E1413 Practice for Separation of Ignitable Liquid Residues from Fire Debris Samples by Dynamic Headspace Concentration onto an Adsorbent Tube
E1588 Practice for Gunshot Residue Analysis by Scanning Electron Microscopy/Energy Dispersive X-Ray Spectrometry
E1605 Terminology Relating to Lead in Buildings
E1610 Guide for Forensic Paint Analysis and Comparison

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] The last approved version of this historical standard is referenced on www.astm.org.

E1618 Test Method for Ignitable Liquid Residues in Extracts from Fire Debris Samples by Gas Chromatography-Mass Spectrometry
E1968 Practice for Microcrystal Testing in Forensic Analysis for Cocaine
E1969 Practice for Microcrystal Testing in Forensic Analysis for Methamphetamine and Amphetamine
E2125 Practice for Microcrystal Testing in Forensic Analysis for Phencyclidine and Its Analogues
E2154 Practice for Separation and Concentration of Ignitable Liquid Residues from Fire Debris Samples by Passive Headspace Concentration with Solid Phase Microextraction (SPME)
E2161 Terminology Relating to Performance Validation in Thermal Analysis and Rheology
E2224 Guide for Forensic Analysis of Fibers by Infrared Spectroscopy
E2225 Guide for Forensic Examination of Fabrics and Cordage
E2227 Guide for Forensic Examination of Dyes in Textile Fibers by Thin-Layer Chromatography
E2228 Guide for Microscopical Examination of Textile Fibers
E2363 Terminology Relating to Manufacturing of Pharmaceutical and Biopharmaceutical Products in the Pharmaceutical and Biopharmaceutical Industry
E2388 Guide for Minimum Training Requirements for Forensic Document Examiners (Withdrawn 2020)[3]
E2678 Guide for Education and Training in Computer Forensics (Withdrawn 2023)[3]
E2808 Guide for Microspectrophotometry in Forensic Paint Analysis
E2809 Guide for Using Scanning Electron Microscopy/Energy Dispersive X-Ray Spectroscopy (SEM/EDS) in Forensic Polymer Examinations
E2882 Guide for Analysis of Clandestine Drug Laboratory Evidence
E2916 Terminology for Digital and Multimedia Evidence Examination
E2917 Practice for Forensic Science Practitioner Training, Continuing Education, and Professional Development Programs
E2927 Test Method for Determination of Trace Elements in Soda-Lime Glass Samples Using Laser Ablation Inductively Coupled Plasma Mass Spectrometry for Forensic Comparisons
E2937 Guide for Using Infrared Spectroscopy in Forensic Paint Examinations
E2998 Practice for Characterization and Classification of Smokeless Powder
E2999 Test Method for Analysis of Organic Compounds in Smokeless Powder by Gas Chromatography-Mass Spectrometry and Fourier Transform Infrared Spectroscopy
E3017 Practice for Examining Magnetic Card Readers
E3085 Guide for Fourier Transform Infrared Spectroscopy in Forensic Tape Examinations
E3115 Guide for Capturing Facial Images for Use with Facial Recognition Systems
E3148 Guide for Postmortem Facial Image Capture
E3149 Guide for Facial Image Comparison Feature List for Morphological Analysis
E3175 Practice for Training in the Forensic Examination of Hair by Microscopy
E3189 Practice for Separation of Ignitable Liquid Residues from Fire Debris Samples by Static Headspace Concentration onto an Adsorbent Tube
E3196 Terminology Relating to the Examination of Explosives
E3197 Terminology Relating to Examination of Fire Debris
E3235 Practice for Latent Print Evidence Imaging Resolution
E3253 Practice for Establishing an Examination Scheme for Intact Explosives
E3255 Practice for Quality Assurance of Forensic Science Service Providers Performing Forensic Chemical Analysis
~~F2725~~E3260 Guide for ~~European Union's Registration, Evaluation, and Authorization of Chemicals (REACH) Supply Chain Information Exchange~~Forensic Examination and Comparison of Pressure Sensitive Tapes
E3272 Guide for Collection of Soils and Other Geological Evidence for Criminal Forensic Applications
E3294 Guide for Forensic Analysis of Geological Materials by Powder X-Ray Diffraction
E3295 Guide for Using Micro X-Ray Fluorescence (μ-XRF) in Forensic Polymer Examinations
E3296 Guide for Using Pyrolysis Gas Chromatography and Pyrolysis Gas Chromatography-Mass Spectrometry in Forensic Polymer Examinations
E3309 Guide for Reporting of Forensic Primer Gunshot Residue (pGSR) Analysis by Scanning Electron Microscopy/Energy Dispersive X-Ray Spectrometry (SEM/EDS)
E3316 Guide for Forensic Examination of Hair by Microscopy
E3329 Practice for Establishing an Examination Scheme for Explosive Residues

2.2 *ISO Standards:*[4]

~~ISO 3534:1993 (E/F) Statistics—Vocabulary and Symbols~~
~~Part 1: Probability and General Statistical Terms~~
~~Part 2: Statistical Quality Control~~

[4] Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, http://www.iso.org.

ISO 3534-1:2006 Statistics—Vocabulary and Symbols—Part 1: General Statistical Terms and Terms Used in Probability
ISO 3534-2:2006 Statistics—Vocabulary and Symbols—Part 2: Applied Statistics
ISO 9000:2005 (E) Standard Quality Management Systems—Fundamentals and Vocabulary
ISO Guide 2 General Terms and Their Definitions Relating to Standardizing Activities
ISO Guide 30 Terms and Definitions Used in Connection with Reference Materials
ISO Guide 35ISO 3534:1993 Reference Materials—General Statistics—Vocabulary and Symbols
and Statistical PrinciplesPart 1: Probability and General Statistical Terms
for CertificationPart 2: Statistical Quality Control
ISO GUM3534-1:2006 Guide to the Expression of Uncertainty in Measurement (GUM)Statistics—Vocabulary and Symbols—
Part 1: General Statistical Terms and Terms Used in Probability
ISO 3534-2:2006 Statistics—Vocabulary and Symbols— Part 2: Applied Statistics
ISO/IEC 7813:2006ISO/IEC 7813:2006 Information Technology—Identification Cards—Financial Transaction Cards
ISO/IEC 10918-1:1994ISO 9000:2005 Information Technology — Digital Compression and Coding of Continuous-Tone Still
Images: Requirements and Guidelines(E) Standard Quality Management Systems—Fundamentals and Vocabulary
ISO 18158:2016 Workplace air — TerminologyAir—Terminology
ISO 21043-1:2018 Forensic sciences — Part Sciences—Part 1: Terms and definitionsDefinitions
2.3 *Other Sources:*
ANSI/NIST-ITL 1-2011 Data Format for the Interchange of Fingerprint, Facial, and Other Biometric Information[5]
EURACHEM *The Fitness for Purpose of Analytical Methods*, EURACHEM Working Group, English Edition
IAAI Glossary *Glossary of Terms Related to Chemical and Instrumental Analysis of Fire Debris*, IAAI Forensic Science
Committee[6]
IEEE 100-2000 The Authoritative Dictionary of IEEE Standards Terms, 7th Edition[7]
IUPAC Terminology *IUPAC Compendium of Chemical Terminology*, Second Edition, 1997
JCGM 200:2012 The International Vocabulary of Metrology – Basic and General Concepts and Associated Terms (2.26 [3.9]
VIM)[8]
NIST SP 800-86 Guide to Integrating Forensic Techniques into Incident Response[5]
NIST SP 800-88 Guidelines for Media Sanitization[5]
SWGDRUG[9]

3. Significance and Use

3.1 These terms have particular application to forensic practice. Entries for Section A of E1732 are chosen variously from Webster's Online Dictionary, international standards, textbooks, and the Compilation of ASTM Standard Definitions. The subcommittee develops definitions when conventional sources fail to yield suitable candidates. Reference citations include:

3.1.1 For ASTM International standards, the standard designation is followed by a dash and a two-digit year designation, e.g., E2161-19. designation in bold type, for example, E2161 - 19. The year citation references the year of publication of the standard from which the entry is taken, not necessarily the current year of publication of the standard.

3.1.2 Citations from other than ASTM International standards may include an abbreviation and the standard number followed by a four-digit year designation, e.g., designation in bold type, for example, ISO 9000:2015. The year citation references the year of publication of the standard from which the entry is taken. Such standards may also be referenced by a name followed by a year designation, e.g., for example, *IUPAC Gold Book 2020.2020*(1).[5] Abbreviations are explicated under "2. Referenced Documents." detailed under, "All terms sourced from other standards than Committee E30 standards are listed in Section 2."

3.1.3 For entries created by members of E30, a brief statement to that effect and a year designation follows the entry, e.g., Created by E30 in 2021.

3.1.3 For entries followed simply by a reference, e.g., for example, ISO 9000:2015 or E456E456-17, - 17, the reader can assume that the entry is accurately copied from the reference with no modifications except for ASTM International format conventions. For entries that are slightly modified versions of something from a known source, reference citations read, "Based upon definition by…" Following the "by" is the source name and year that the entry was taken, or modified, for inclusion in Section A. taken or modified. The boldface numbers in parentheses refer to a list of references at the end of the terminology.

[6] Tenax is a trademark of Buchem B.V. in Apeldoorn, Netherlands.
[7] Available from Institute of Electrical and Electronics Engineers, Inc. (IEEE), 445 Hoes Ln., Piscataway, NJ 08854, http://www.ieee.org.
[8] Available from Joint Committee for Guides in Metrology (JCGM), https://www.bipm.org/en/committees/jc/jcgm.
[9] Available from the Scientific Working Group for the Analysis of Seized Drugs, http://www.swgdrug.org.
[5] The boldface numbers in parentheses refer to a list of references at the end of this standard.

3.1.4 For entries from textbooks, a reference following the entry ~~will have~~ has the name or title of the text, author(s), edition (if ~~applicable)~~applicable), and the year of publication or copyright.

~~3.1.6 For entries of unknown origin currently in E1732 Section A, a statement declaring that a review of these entries by E30 occurred in a particular year follows the entry e.g., Reviewed by E30 in 2021.~~

3.1.5 An entry ~~may be such that the~~ could have a definition of a term ~~has one reference and the DISCUSSION, following the definition,~~with one reference, and the discussion following the definition has a different reference.

3.1.6 Citations from *Merriam-Webster's Online Dictionary*(2) include the date retrieved from the online dictionary and the URL of the cited term and definition.

3.1.7 Each definition is followed by the designation of the E30 subcommittee responsible shown in square brackets; for example, [E30.11].

4. ~~Terminology~~Terminology: Terms and Definitions

~~SECTION A: GENERAL (COMMON) FORENSIC SCIENCE TERMS~~

~~The terms defined in Section A are the direct responsibility of Subcommittee E30.92, Terminology.~~

4.1 *Terms and Their Definitions:*

absorbent, *n*—any substance exhibiting the property of absorption. **[E30.01] E3197 - 20**

absorption, *n*—penetration of one substance into the inner structure of another, as distinguished from adsorption, in which one substance is attracted to and held on the surface of another. **[E30.01] E3197 - 20**

accuracy, *n*—closeness of agreement between a test result and the accepted reference value. **[E30.92] E177 - 19**

DISCUSSION—

In practice, the accepted reference value is substituted for the true value. The term "accuracy," when applied to a set of test or measurement results, involves a combination of random components and a common systematic error or bias component. Accuracy refers to a combination of trueness and precision. **ISO 3534-2:2006**

achievable resolution, resolving power, *n*—measure of imaging system's practical limit to distinguish between separate adjacent elements, typically by imaging a known reference standard. **[E30.12] E2916 - 19e1**

acquisition, *n—in computer forensics*, process of using an access interface to read digital data from a digital source and create a destination object. **[E30.12] E2916 - 19e1**

activated carbon, *n*—form of carbon characterized by high adsorptivity for many gases, vapors, and colloidal solids that is typically activated by heating to 800 °C to 900 °C with steam or carbon dioxide, which results in a porous internal structure; also known as activated charcoal. **[E30.01] E3197 - 20**

activated carbon strip, ACS, *n*—homogenous mixture of activated charcoal and an inert polymer formed into a strip; a convenient adsorption medium for fire debris analysis. **[E30.01] E3197 - 20**

activation energy, *n*—amount of energy needed to take the starting materials from their reasonably stable form at 25 °C and convert them to a reactive, higher-energy excited state. **[E30.01] E3196 - 21**

ad hoc image,*n*—see **uncontrolled image**. **[E30.12] E2916 - 19e1**

additive (modifier), *n*—any substance added in a small quantity to improve properties; additives include substances such as driers, corrosion inhibitors, catalysts, ultraviolet absorbers, and plasticizers. **[E30.01] E2937 - 18**

additive (modifier), *n*—any substance added in a small quantity to improve properties. **[E30.01] E1610 - 18**

DISCUSSION—
Additives can include substances such as driers, corrosion inhibitors, catalysts, ultraviolet absorbers, plasticizers, and so forth.

additives, *n*—materials that are included in adhesive or backing formulations to increase overall volume, impart color, or provide other desired properties. **[E30.01] E3260 - 21**

adhesive, *n*—material that holds two or more objects together solely by intimate surface contact. **[E30.01] E3260 - 21**

adsorbent, *n*—substance that has the ability to condense or hold molecules of other substances on its surface. **[E30.01] E3197 - 20**

DISCUSSION—
Activated carbon, activated alumina, silica gels, Tenax,[6] and some stationary phase-coated SPME fibers are examples of adsorbents or adsorbent devices.

adsorption, *n*—adherence of atoms, ions, or molecules of a gas or liquid to the surface of another substance. **[E30.01] E3197 - 20**

aggregate(s) [clump(s)]—group of soil particles that cohere to each other more strongly than to other surrounding particles. **[E30.11] E3272 - 21**

DISCUSSION—
Soil aggregates can be natural (a ped) or formed by human activities (a clod). Often the genesis of evidentiary soil aggregates is unknown, so aggregate is often a preferred term in descriptions of soil evidence.

aggregation, *n*—collecting of units or parts into a mass or whole. **[E30.01] E1968 - 19, E1969 - 19, E2125 - 19**

alibi location(s), *n*—known location suggested or linked to a subject (for example, a subject's home) that is distinct from the crime scene. **[E30.11] E3272 - 21**

DISCUSSION—
The term alibi or alibi location can be perceived negatively, but comparisons of geological materials from alibi locations can be exonerating. Alibi location is used in this standard to be succinct; however, use of this term in documentation of evidence, evidence examination reports, or courtroom testimony is discouraged.

aliphatic, *adj*—descriptive of one of the major groups of organic compounds characterized by normal, branched, or cyclic chain arrangement of the constituent carbon atoms but does not include aromatic compounds. **[E30.01] E3197 - 20**

alkadiene, *n*—class of unsaturated aliphatic hydrocarbons having two double bonds; also known as diene. **[E30.01] E3197 - 20**

alkane, *n*—class of aliphatic hydrocarbons characterized by a straight or branched carbon chain; generic formula C_nH_{2n+2}; also known as paraffin. **[E30.01] E3197 - 20**

DISCUSSION—
In the plural form, also sometimes used to refer to the general class of aliphatic compounds that includes branched, normal, and cycloalkanes.

alkene, *n*—class of unsaturated aliphatic hydrocarbons having one or more double bond(s); also known as olefin. **[E30.01] E3197 - 20**

DISCUSSION—
In the plural form, also sometimes used in fire debris analysis to refer to the general class of aliphatic compounds with one or more double bonds.

allocated space, allocated storage, *n—in computer forensics*, the portions of storage that are assigned or reserved for active instructions or for data. **[E30.12] E2916 - 19e1**

alloy, *n*—solid or liquid mixture of two or more metals or one or more metals with certain non-metallic elements as in carbon steels. **[E30.01] E3196 - 21**

anagen, *n*—active growth phase of a hair follicle in the hair growth cycle. **[E30.01] E3175 - 22, E3316 - 22**

DISCUSSION—
The root from a pulled anagen hair is elongated and is usually fully pigmented.

ancestral group, *n*—biogeographic designation of human populations (for example, Asian, African, European) whose hair can share similar morphological and microscopic traits. **[E30.01] E3175 - 22, E3316 - 22**

DISCUSSION—
The racial terms Caucasoid, Mongoloid, and Negroid should not be used as these terms are no longer acceptable in the field of anthropology (the field from which these designations originated).

ANFO, *n*—mixture that consists of ammonium nitrate and fuel oil. **[E30.01] E3196 - 21**

anion, *n*—ion having a negative charge. **[E30.01] E3196 - 21**

DISCUSSION—
Examples of anions are NO3- in KNO3 or ClO4- in NH4ClO4.

anisotropic, *adj*—characteristic of an object in which the refractive index differs depending on the direction of propagation or vibration of light through the object. **[E30.01] E2228 - 19**

anthropometric analysis, *n—in facial identification*, an explicit measurement of landmarks on a face and a comparison of these measurements between two samples. **[E30.12] E2916 - 19e1**

anti-forensics, *n*—application of a process to modify, conceal, or destroy information to inhibit or prevent the effectiveness of forensic science examinations. **[E30.12] E2916 - 19e1**

aperture, *n*—beam-restricting orifice in an electron optical column; the orifice diameter influences the beam current and depth of focus. **[E30.01] E2809 - 22**

aperture, *n*—opening in an optical system that controls the amount of light passing through a system. **[E30.01] E2224 - 19**

apprenticeship, *n*—relationship in which an individual works for an entity while learning skills. **[E30.11] E2917 - 19a**

archive image, *n—in computer forensics*, a bit stream duplicate of data placed on media that is suitable for long-term storage. **[E30.12] E2916 - 19e1**

aromatic, *n*—major group of unsaturated cyclic hydrocarbons containing one or more rings, typified by benzene, which has a 6-carbon ring containing nominally three double bonds. **[E30.01] E3197 - 20**

DISCUSSION—
In fire debris, this term is typically used to refer to alkylbenzenes, which are benzene rings with aliphatic substitutions.

artifact, *n*—by-product, artificial feature, or change resulting from human activity or a technical process (compare noise). **[E30.12] E2916 - 19e1**

DISCUSSION—
Examples include speckles in a scanned picture, "blocking" in compressed images, distortion in over-saturated audio, and the automatic creation of temporary files because of normal usage of a computer.

aspect ratio, *n*—ratio of the width to the height of a rectangle, such as an image, a pixel, or an active video frame. **[E30.12] E2916 - 19e1**

association, inclusion, *n*—result of a comparison between two hair samples in which the characteristics of the questioned hair are present in the known sample without any exclusionary differences and, therefore, the donor of the known hair sample can be included as a possible source of the questioned hair. **[E30.01] E3175 - 22**

DISCUSSION—
A microscopical association of hair cannot identify the definitive source of a questioned hair to the exclusion of all others and the number of individuals who could be included as a possible donor of a specific hair is unknown and cannot be reliably estimated.

association, inclusion, *n*—result of a comparison between two hair samples in which the characteristics of the questioned hair are present in the known sample without any exclusionary differences, and therefore, the donor of the known hair sample can be included as a possible source of the questioned hair. **[E30.01] E3316 - 22**

DISCUSSION—
A microscopical association of hair cannot identify the definitive source of a questioned hair to the exclusion of all others, and the number of individuals who could be included as a possible donor of a specific hair is unknown and cannot be reliably estimated.

associative evidence, *n*—item(s) that could link a person, place, or thing with another person, place, or thing. **[E30.92] E1732 - 22**

attempt, *n—in facial identification*, a submission of a single set of biometric samples to a biometric system for identification or verification (compare biometric search). **[E30.12] E2916 - 19e1**

attenuated total reflection (ATR), *n*—method of spectrophotometric analysis based on the reflection of energy at the interface of two media that have different refractive indices and are in intimate contact with each other. **[E30.01] E2224 - 19**

audio enhancement, *n*—processing and filtering of audio recordings to improve the signal quality and intelligibility of the signals of interest, such as speech, by attenuating noise or otherwise increasing the signal-to-noise ratio. **[E30.12] E2916 - 19e1**

background, *n*—apparent absorption caused by anything other than the substance for which the analysis is being made. **[E30.01] E2224 - 19, E131 - 10(2015)**

background, *n*—signal produced by the entire analytical system apart from the material of interest. **[E30.01] E2937 - 18, E3085 - 17**

background radiation, *n*—X-rays resulting from scattered Bremsstrahlung and coherently and incoherently scattered tube target peaks. **[E30.01] E3295 - 22**

background sample, *n*—recovered sample from a source believed not to have been exposed to pGSR. **[E30.01] E3309 - 21**

DISCUSSION—
Background samples can be used to establish a threshold value.

backing, *n*—thin flexible material to which adhesive is applied. **[E30.01] E3260 - 21**

backlight, *n—in facial identification*, a light source placed behind a subject in a controlled capture that reduces background shadows. **[E30.12] E2916 - 19e1**

backlit, *adj*—characteristic of a subject or an object that is illuminated from behind. **[E30.12] E2916 - 19e1**

backscattered electron (BE) imaging, *n*—technique that uses high energy electrons that originate from the primary electron

beam of the SEM and are elastically reflected by the specimen to create an image of the sample; the probability of backscattering is proportional to atomic number. **[E30.01] E2809 - 22**

backsize, *n*—layer applied to the top side of the backing and its purpose is to coat and fill a porous surfaced backing with a material that is inert to the adhesive formulation to be used. **[E30.01] E3260 - 21**

ball powders, *n*—class of smokeless powders produced by a process where the final grain morphologies are spherical, flattened-ball, or flake. **[E30.01] E2998 - 16**

barrier filter, *n*—filter used in fluorescence microscopy that suppresses unnecessary excitation energy that has not been absorbed by the fiber and selectively transmits only energy of greater wavelengths than the cut-off wavelength or within a specific wavelength range. **[E30.01] E2228 - 19**

base charge, *n*—main high explosive charge. **[E30.01] E3196 - 21**

batch mode search, *n—in facial identification*, a mode of searching records in an automated system in which a group of probes are simultaneously or sequentially launched. **[E30.12] E2916 - 19e1**

batch search mode,*n*—see **batch mode search**. **[E30.12] E2916 - 19e1**

Becke line, *n*—bright halo near the boundary of a fiber that moves with respect to that boundary as the microscope is focused through best focus when the fiber is mounted in a medium that differs from its refractive index. **[E30.01] E2228 - 19**

Becke line method, *n*—method for determining the refractive index of a fiber relative to its mountant by noting the direction in which the Becke line moves when the focus is changed. **[E30.01] E2228 - 19**

DISCUSSION—

The Becke line always moves toward the higher refractive index medium (fiber or mountant) when focus is raised (stage is lowered) and towards the lower refractive index medium when focus is lowered (stage is raised). At the point where the index of the fiber matches the index of the mounting medium, the Becke line is no longer visible. The Becke line is generally viewed at a wavelength of 589 nm (the D line of Sodium [n_D]).

biaxially oriented polypropylene (BOPP), *n*—oriented polypropylene film in which the polymer has been stretched in both the machine direction and cross direction during the manufacturing process; tapes with such films cannot be torn by hand. **[E30.01] E3260 - 21**

binary explosive, *n*—high explosive consisting of a separate oxidizer and fuel that can be acquired, stored, or shipped individually but, when combined, form an explosive mixture. **[E30.01] E3196 - 21**

binder, *n*—non-volatile portion of a paint, which serves to bind or cement the pigment particles together. **[E30.01] E1610 - 18**

binder, *n*—nonvolatile portion of the liquid vehicle of a coating, which serves to bond or cement the pigment particles together. **[E30.01] E2937 - 18**

binning, *n—in facial identification*: (*1*) any technique used by a facial recognition (FR) system to organize or optimize searching based upon some piece(s) of metadata; (*2*) the process of parsing (examining) or classifying data to accelerate or improve biometric matching. **[E30.12] E2916 - 19e1**

biometric search, *n*—submission of a biometric reference as a probe against a biometric system for identification (one-to-many) or verification (one-to-one) (compare **attempt**.) **[E30.12] E2916 - 19e1**

birefringence, *n*—property of some crystals, those having more than one refractive index; this property will result in interference colors, which are viewed through a polarized light microscope. **[E30.01] E1968 - 19, E1969 - 19**

birefringence, *n*—property of some crystals, those having more than one refractive index; this will result in interference colors which are viewed through a polarized light microscope. **[E30.01] E2125 - 19**

birefringence, *n*—numerical difference in refractive indices (n) for a fiber, given by the equation:

$$|n\|-n\perp|$$

Birefringence (B) can be calculated by determining the retardation (r) and thickness (T) at a particular point in a fiber and by using the equation:

$$B = r\,(\text{nm})/1000T\,(\mu\text{m})$$

[E30.01] E2228 - 19

birefringent, *adj*—material exhibiting birefringence. **[E30.01] E1968 - 19, E1969 - 19, E2125 - 19**

bit depth, *n*—number of bits (binary digits) used to specify the brightness or color range of each pixel in an image sensor. **[E30.12] E3235 - 21**

bit stream, *n*—continuous stream of bits transmitted over a channel with no separators between the character groups. **[E30.12] E2916 - 19e1**

bit stream duplicate, *n—in computer forensics*, an exact, bit-for-bit reproduction of all data objects independent of any physical media upon which that data is stored (compare **copy**.) **[E30.12] E2916 - 19e1**

black powder, *n*—low explosive composed of potassium nitrate, sulfur, and charcoal; commercial products are generally glazed and produced in specific granulation size ranges. **[E30.01] E3196 - 21**

DISCUSSION—
Sodium nitrate can be found in place of potassium nitrate.

black powder substitute, *n*—commercially produced low explosive powder that is designed to replace traditional black powder in muzzle-loading weapons; formulations can include potassium perchlorate in addition to potassium nitrate or can use other fuels such as ascorbic acid. **[E30.01] E3196 - 21**

DISCUSSION—
Many black powder substitutes are sulfur-free.

blades, *n*—broad, flat, elongated crystals. **[E30.01] E1969 - 19**

blank, *n*—control where a specified component(s) is not present. **[E30.11] E3255 - 21**

DISCUSSION—
Blanks with various designations can be specified, such as system blank, process blank, method blank, reagent blank, solvent blank, and so forth. Certain blanks may also serve as a negative control.

blasting agent, *n*—non-detonator sensitive explosive that shall be initiated by a booster or requires a primer to detonate. **[E30.01] E3196 - 21**

DISCUSSION—
Many ammonium-nitrate-based explosives fall into this category.

blasting cap, *n*—cylindrical shell, usually of metal, containing both a primary high explosive and a secondary high explosive, which is used to initiate other explosives; also known as a detonator or cap. **[E30.01] E3196 - 21**

bomb, *n*—explosive device, usually some kind of container filled with explosive, incendiary material, gas, or other destructive substance, designed to cause damage by way of thermal, blast, or fragmentation effects on impact or when detonated by a time mechanism, switch, remote control device, electric match, or lit fuse. **[E30.01] E3196 - 21**

booby trap, *n*—device with a hidden or concealed triggering mechanism designed to be initiated by the victim; also known as a victim-activated device. **[E30.01] E3196 - 21**

booster, *n*—detonator-sensitive high explosive charge used to initiate a main-charge explosive that is usually detonator insensitive. **[E30.01] E3196 - 21**

Bragg equation or Bragg's law, *n*—describes the physical phenomenon of X-ray scattering from a crystallographic three-dimensional lattice plane as $n\lambda = 2d\sin\theta$, in which *n* is any integer, λ is the wavelength of the X-ray, *d* is the crystal plane separation, also known as *d*-spacing, and θ is the angle between the crystal plane and the diffracted beam, also known as the Bragg Angle. **[E30.01] E3294 - 22**

braid, *n*—the intertwining of strands in a braiding process to produce a rope structure. **[E30.01] E2225 - 23**

branched alkane, *n*—subclass of aliphatic hydrocarbons with the general formula C_nH_{2n+2}, with subordinate chains branching off of the main chain; also known as isoparaffin and isoalkane. **[E30.01] E3197 - 20**

brisance, *n*—ability of an explosive to shatter an object when fired in direct contact or in its vicinity. **[E30.01] E3196 - 21**

buckling, *n*—abrupt change in the shape and orientation of a hair shaft with or without a slight twist. **[E30.01] E3175 - 22, E3316 - 22**

cache, *n—in computer forensics*, a temporary storage area set aside on a processor, in memory, or in a filesystem to keep frequently needed data readily available, designed to speed up processing and improve performance. **[E30.12] E2916 - 19e1**

calendering, *v*—method of producing adhesive tape by pressing an adhesive to a backing material through a series of heated rollers; the surface appearance depends on the type of roller used. **[E30.01] E3260 - 21**

calendering marks, *n*—characteristic marks left on the backing material because of the manufacturing process. **[E30.01] E3260 - 21**

calibration, *n*—set of operations that establishes, under specified conditions, the relationship between values indicated by a measuring instrument or measuring system or values represented by a material, and the corresponding known values of measurement. **[E30.92] E1732 - 22**

DISCUSSION—
This definition was originally defined in Terminology E1187, a standard discontinued by ASTM International.

calibration standard, *n*—used to determine the quantitative analysis for the analyte elements of interest in the glass matrix. **[E30.01] E2927 - 16e1**

DISCUSSION—
The calibration standard(s) shall have a known elemental composition including a known uncertainty for the reported analytes.

candidate list, *n—in facial identification*, a rank ordered list generated from a facial recognition search. **[E30.12] E2916 - 19e1**

candidate particles, *n*—particle(s) classified by the instrument software based on detection of appropriate (as specified in Practice E1588) constituent elements as potential pGSR. **[E30.01] E3309 - 21**

capacity, *n*—amount of finished product that could be produced either in one batch or over a defined period of time and given a set list of variables. **[E30.01] E2882 - 19**

cap-sensitive, *adj*—reliably initiated with a detonator; also known as detonator-sensitive. **[E30.01] E3196 - 21**

capture, *n*—(*1*) the process of recording data such as an image, video sequence, or audio stream and (*2*) *in facial identification*, the process of collecting a biometric sample from an individual via a sensor. **[E30.12] E2916 - 19e1**

capture, *v*—to record data, such as an image, video sequence, audio stream, or biometric sample to digital storage, often by means of a sensor. **[E30.12] E2916 - 19e1**

capture card, frame grabber, *n*—piece of computer hardware that accepts an analog or digital signal and outputs the signal as digital data. **[E30.12] E2916 - 19e1**

capture device, *n*—device used in the recording of data. **[E30.12] E2916 - 19e1**

carve, *v*—*in computer forensics*, to extract a portion of data for the purpose of analysis. **[E30.12] E2916 - 19e1**

catagen, *n*—transitional phase of the hair follicle between the active growth phase (anagen) and the resting phase (telogen) in the hair growth cycle. **[E30.01] E3175 - 22, E3316 - 22**

catalyst, *n*—any substance of which a small proportion notably affects the rate of a chemical reaction without itself being consumed or undergoing a chemical change. **[E30.01] E3196 - 21**

catalyst, *n*—substance whose presence initiates or changes the rate of a chemical reaction, but does not itself enter into the reaction. **[E30.12] E2916 - 19e1**

cathodoluminescence, *n*—emission of photons in the ultraviolet (UV), visible (Vis), and infrared (IR) regions of the electromagnetic spectrum as a result of electron beam interaction with certain materials. **[E30.01] E2809 - 22**

cation, *n*—ion having a positive charge. **[E30.01] E3196 - 21**

DISCUSSION—
Examples of cations are K^+ in KNO_3 or NH_4^+ in NH_4ClO_4.

cellophane, *n*—thin, transparent sheet made of regenerated cellulose that can be used as a backing material in tape products. **[E30.01] E3260 - 21**

cellulose acetate, *n*—type of transparent film that is used for tape backings. **[E30.01] E3260 - 21**

DISCUSSION—
A matte surface is used for write-on tapes. Cellulose acetate is more moisture-resistant than cellophane.

cellulosic fiber, *n*—fiber composed of polymers formed from glucose subunits (for example, vegetable, rayon/Lyocell). **[E30.01] E2224 - 19**

certification authority, *n*—(*1*) *in computer forensics*, a trusted third party entity that issues digital certificates certifying the ownership of a public key by the subject named in the certificate, and trusted by both entities engaged in a digital transaction and (*2*) *in facial identification*, a body that issues biometric documents and certifies that the data stored on the documents are genuine. **[E30.12] E2916 - 19e1**

certified reference material, *n*—reference material (RM) characterized by a metrologically valid procedure for one or more specified properties and accompanied by an RM certificate that provides the value of the specified property, its associated uncertainty, and a statement of metrological traceability. **[E30.11] E3255 - 21**

chain of custody, *n*—procedures and documents that account for the possession of a sample by tracking its handling and storage from its point of collection to its final disposition. **[E30.92] E1732 - 22**

chain reaction, *n*—self-sustaining chemical or nuclear reaction yielding energy or products that cause further reactions of the same kind. **[E30.01] E3196 - 21**

characteristic descriptors, *n*—minutiae of the component characteristics. **[E30.12] E3149 - 18**

characteristic particles, *n*—particles that have compositions rarely found in particles from any other source. **[E30.01] E1588 - 20**

characteristic X-ray, *n*—X-ray emission resulting from de-excitation of an atom following inner shell ionization. **[E30.01] E3295 - 22**

DISCUSSION—
The energy of a characteristic X-ray is related to the atomic number of the atom, providing the basis for energy dispersive X-ray spectroscopy.

charcoal, *n*—highly porous form of amorphous carbon. **[E30.01] E3196 - 21**

charge-coupled device (CCD), *n*—silicon-based semiconductor chip consisting of a linear or two-dimensional array of photo sensors or pixels that transfers an electrical charge and converts it into a digital value. **[E30.01] E2808 - 21a**

charging, *n*—negative charge accumulation on either a nonconductive sample or a sample that is not properly grounded. **[E30.01] E2809 - 22**

DISCUSSION—
This effect may interfere with image formation and X-ray analysis because of beam deflection. It can usually be eliminated by the application of a conductive coating or by the use of a low vacuum system.

chemical reaction bomb (CRB), *n*—device designed to cause a mechanical explosion by overpressure of the container because of a chemical reaction, generally produced by the mixing of commonly available chemicals or products. **[E30.01] E3196 - 21**

DISCUSSION—
Examples include the mixing of hydrochloric acid and aluminum foil and mixing sodium hydroxide, water, and aluminum foil.

clarification,*n*—see **enhancement**. **[E30.12] E2916 - 19e1**

clarify,*n*—see **enhance**. **[E30.12] E2916 - 19e1**

class, *n*—group, set, or kind sharing common attributes (examples provided in Ref (2)). **[E30.92] E1732 - 22**

class characteristic(s), *n*—attribute(s) that establish membership in a class. **[E30.92] E1732 - 22**

classification, *n*—systematic arrangement of hairs into categories (for example, human, animal, somatic origin, ancestry) based on shared traits. **[E30.01] E3175 - 22, E3316 - 22**

classification, *n*—systematic arrangement of persons or objects into categories (groups or classes) based on shared traits or characteristics. (3) **[E30.92] E1732 - 22**

clean room, clean chamber, positive air flow cabinet, *n*—to the extent possible, a limited particulate environment. **[E30.12] E2916 - 19e1**

DISCUSSION—
For example, requirements would follow ISO 5 or Class 100 standard for air quality.

clear, *v—in computer forensics*, to overwrite storage space on a medium with non-sensitive data, which may include overwriting not only the logical storage location of files, but may include all addressable locations. **[E30.12] E2916 - 19e1**

cluster, *n—in computer forensics*, a group of contiguous sectors on storage media, typically the smallest unit of allocation in a filesystem. **[E30.12] E2916 - 19e1**

coating, *n*—generic term for paint, lacquer, enamel, or other liquid or liquifiable material that is converted to a solid, protective, decorative, or combination thereof film after application. **[E30.01] E1610 - 18**

coating, *n*—generic term for paint, lacquer, enamel, or other liquid or liquefiable material that is converted to a solid, protective, or decorative film or a combination of these types of films after application. **[E30.01] E2937 - 18**

cocaine, *n*—either *d*- or *l*- cocaine; it should be noted that *l*-cocaine is the naturally occurring isomer found in the coca plant. **[E30.01] E1968 - 19**

codec, *n*—algorithm to encode and decode digital data, typically to reduce the amount of data for transmission or storage. **[E30.12] E2916 - 19e1**

DISCUSSION—
A codec is not a storage format, but may be required to interpret stored data.

cognitive image analysis, *n—in image and video analysis*, a process used to extract visual information from an image by human evaluation. **[E30.12] E2916 - 19e1**

coherent (Rayleigh) scatter peaks—spectral artifacts that result from elastic scattering of the tube target characteristic X-rays by the sample. **[E30.01] E3295 - 22**

DISCUSSION—
Because no energy is lost in elastic scattering, coherent scatter peaks occur at the same energies as the tube target characteristic X-rays.

color range,*n*—see **gamut**. **[E30.12] E2916 - 19e1**

combustible, *n*—any substance that will burn, regardless of its autoignition temperature, or whether it is a solid, liquid or gas. **[E30.01] E3197 - 20**

combustible, *adj*—capable of undergoing combustion. **[E30.01] E3197 - 20**

combustible liquid,*n*—see **ignitable liquid**. **[E30.01] E3197 - 20**

combustion, *n*—usually rapid chemical process (such as oxidation) that produces heat and usually light. **[E30.01] E3196 - 21**

combustion, *n*—usually rapid chemical process (as oxidation) that produces heat and usually light. **[E30.01] E3197 - 20**

combustion product, *n*—heat, gases, volatilized liquids and solids, particulate matter, and ash generated by combustion. **[E30.01] E3197 - 20**