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**Standard for Examination of Stamping Devices and  
Stamp Impressions**



## Standard for Examination of Stamping Devised and Stamp Impressions

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## Foreword

Forensic document examiners encounter cases involving stamping device impressions. Dies of a stamping device come in a variety of materials that include, but are not limited to vulcanized rubber, photopolymer, laserable rubber, gel, and metal. Regardless of the die material, the procedures for a forensic examination of the stamp and stamp impressions remain the same. The examiner should determine class and randomly acquired characteristics. The examination of stamping devices and resulting impressions follows a logical approach as it involves mechanical impressions and materials that lend themselves to objective observations.

This standard summarizes commonly accepted techniques, technologies, and procedures.

This document was revised, prepared, and finalized as a standard by the Forensic Document Examination Consensus Body of the AAFS Standards Board. The draft of this standard was developed by the Forensic Document Examination Subcommittee of the Organization of Scientific Area Committees (OSAC) for Forensic Science. The initial draft document was originally developed in 2003 by the Scientific Working Group for Forensic Document Examination (SWGDOC).

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

**Keywords:** *forensic sciences, questioned documents, stamping devices, impressions.*

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# Standard for Examination of Stamping Devices and Stamp Impressions

## 1 Scope

This standard provides procedures to be used by forensic document examiners for forensic examinations and comparisons involving stamp impressions (often referred to as rubber stamp impressions) and stamping devices.

## 2 Normative Reference

The following reference is indispensable for the application of the standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

*SWGDOC Standard for Minimum Training Requirements for Forensic Document Examiners, 2013<sup>a</sup>*

## 3 Terms and Definitions

For purposes of this document, the following definitions apply.

### 3.1

#### **coincidental peripheral printing**

Printing resulting from an impression in an unintended printing area, often on the periphery of a stamp. This may be due to the manufacturing process or the stamping technique.

### 3.2

#### **class characteristic**

A feature or defect specific to a production run and not to a specific stamp (for example, size, type style, design, text, and shape).

### 3.3

#### **die**

The trimmed material bearing the printed image and/or text of the stamp.

### 3.4

#### **die plate**

Part of the stamp container where the stamp die is mounted.

### 3.5

#### **duplicate**

A copy of a genuine stamp. The source of duplication can either be the matrix board allowing for die text to be mass produced or using an impression from the genuine (original) stamp.

### 3.6

#### **first generation stamping**

The first impression made with the stamp after inking.

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<sup>a</sup> <http://www.swgdoc.org/index.php/standards/published-standards>

**3.7**

**flat die**

The text of the stamp die is not raised but flat on the die plate. Micropores remain open to allow ink to exit from the stamp onto the substrate producing the stamp image. Light burst and thermal printing are two technologies used to produce flat die stamps.

**3.8**

**gel die**

A microporous material saturated with ink.

**3.9**

**hand stamp**

A stamp that requires a separate ink pad when making impressions.

**3.10**

**laser cut die**

Process of stamp manufacturing using “laserable rubber” (pre-vulcanized natural rubber) and laser engraving to cut the image to form the die of the stamp.

**3.11**

**Light Burst Technology**

Use of a xenon flash in the manufacturing of a flat die stamp. Numerous light bursts are used to seal the background of the stamp pad leaving open micropores in the area of the flat die to print the text.

**3.12**

**manufacturing defect**

An anomaly produced during the die’s manufacturing process resulting in a damaged area creating a non-print area in the impression. This is often referred to as a permanent defect.

**3.13**

**metal self-inker**

A self-inking stamp with a metal container instead of plastic.

**3.14**

**mount**

The plate in the stamp assembly that holds the die.

**3.15**

**non-porous**

A substrate that has no openings to absorb ink and requires an ink that will air dry.

**3.16**

**photopolymer**

A photosensitive plastic that hardens when exposed to ultraviolet light.

**3.17**

**pre-inked stamp**

The ink is contained in the die of the stamp; therefore, an ink pad is not required. Gel, salt-leached, and flat dies are pre-inked.

**3.18**  
**progressive defect**

A defect or feature that appears during the use of the stamp and can change with additional usage.

**3.19**  
**Randomly Acquired Characteristic**  
**RAC**

A feature or defect specific to one stamp that can occur in the manufacturing process or from individual usage occurring after manufacture (for example, wear and damage defects such as cuts and gouges, reproducible blemishes, impression voids, improper and extraneous inking, or coincidental peripheral printing). The position, orientation, size and shape of these characteristics are essential to the identification of a stamp as the source of an impression.

**3.20**  
**rubber die**

Relief letters or image in a rubber material. This is the part of the stamping device that actually prints the message.

**3.21**  
**stamping device**

A hand-marking device capable of making an inked impression using a variety of die materials that include, but are not limited to, vulcanized rubber, laserable rubber, photopolymer, gel, and metal. Synonyms: hand stamp, self-inking stamp, pre-inked stamp, flat-die, cachet.

**3.22**  
**second and third-generation stamping**

Succeeding impressions after the first impression is made without re-inking the stamp.

**3.23**  
**self-inking stamp**

A stamp in a container (may be metal or plastic) that houses a rotating die plate seated against a miniature stamp pad. The die plate rotates to the enclosed ink pad to re-ink after every impression. This action allows for repetitive stamping and a separate ink pad is not needed.

**3.24**  
**stamp impression**

The product of direct physical contact of an item, such as a stamping device, resulting in transfer of the characteristics of that item onto the substrate.

**3.25**  
**thermal printing**

Heat is used to close the non-printing area micropores on the flat die.

**3.26**  
**transitory defect**

An anomaly such as dust, hair, dirt, or fiber that attaches itself to the material of the stamp die and can create a non-print area in the impression. A transitory defect is not part of the die or stamp; therefore, it can easily be removed by use or cleaning.

### 3.27

#### **vulcanized rubber**

Raw, opaque rubber that has been pressurized with heat to harden sufficiently for use as a stamp die.

## **4 Requirements**

### **4.1 Competence**

#### **4.1.1 General**

Competency in the examination of stamping device examinations on documents is based upon a combination of knowledge, skills, and abilities acquired through appropriate education, training, and experience specific to forensic document examination.

#### **4.1.2 Requisite Knowledge, Skills, and Abilities**

It is critical that the forensic document examiner has a knowledge base that includes the manufacturing processes of materials used in the production and preservation of documents as well as the skills and abilities to analyze, compare, and evaluate case-related items. The examiner's training shall conform to the requirements of *SWGDOC Standard for Minimum Training Requirements for Forensic Document Examiners, 2013*.

### **4.2 Equipment**

#### **4.2.1** Light source(s) of sufficient intensity to allow fine detail to be distinguished.

NOTE Natural light, incandescent or fluorescent light sources, or fiber optic lighting systems are generally accepted. Transmitted illumination, side lighting, and vertical incident lighting have been found to be useful.

#### **4.2.2** Magnification sufficient to allow fine detail to be distinguished.

#### **4.2.3** Other apparatus and software as appropriate.

#### **4.2.4** Imaging or other equipment for recording observations as appropriate.

#### **4.2.5** Stamp, stamp ink pad and adequate smooth (bond) paper or other suitable substrate to collect specimens from the stamping device if available.

#### **4.2.6** Sufficient time and facilities to complete all applicable procedures.

### **4.3 Significance and Use**

**4.3.1** Stamping devices are used on documents as a means to print commonly used terms such as "copy", "paid", and "x-ray" or to provide a facsimile signature. Stamp impressions are produced by a variety of stamping devices that include, but are not limited to, hand stamp, self-inking stamp, pre-inked stamp, rotary die stamp, and flat die stamp. Dependent upon the die material, the impression can be water-based or oil-based ink. The examination can incorporate visualization of RACs using a range of magnification from 2x to 40x and instrumentation to conduct infrared and infrared luminescence examinations.

**4.3.2** The procedures outlined here are grounded in the generally accepted body of knowledge and experience in the field of forensic document examination. By following these procedures, a forensic document examiner can reliably reach an opinion concerning whether two or more impressions have a common origin or if a stamping device impression was created by a specific stamping device.

#### **4.4 Interferences**

**4.4.1** Items submitted for examination may have inherent limitations that can interfere with the procedures in this guide. Limitations can be due to submission of non-original documents, limited quantity or comparability, or condition of the items submitted for examination (for example, impressions made with over-inked or inadequately inked stamps, partially imprinted impressions, or variations in surface textures). Such features are taken into account in this standard.

**4.4.2** Limitations should be noted and recorded.

**4.4.3** The effects of prior storage, handling, testing, or chemical processing (for example, for latent prints) can interfere with the ability of the examiner to see certain characteristics. Whenever possible, document examinations should be conducted prior to any chemical processing. Items shall be handled in a manner that avoids compromising subsequent examinations

**4.4.4** Considerations shall be given to the possibility that a stamping device can be manufactured which duplicates the impressions of another stamp, and that various forms of duplication of stamping device impressions can be generated by computer and other means.

#### **4.5 Procedure**

**4.5.1** The examiner shall conduct an initial assessment to determine the appropriate examinations, the sequence of examinations, and the potential limiting factors.

**4.5.2** Following initial assessment, the examiner shall proceed to the applicable examinations.

**4.5.3** These procedures need not be performed in the order given. Deviations from this standard shall be documented and justified.

**4.5.4** Contemporaneously document the examinations performed, relevant observations, and basis for results in sufficient detail to allow for an independent review and assessment of the conclusions by a forensic document examiner (SWGDOC *Scope of Work of Forensic Document Examiners*, 2013). Include any relevant fact(s), method(s), interpretation(s), evaluation(s), and conclusion(s), opinion(s), or other finding(s).

**4.5.5** At various points in these procedures, the forensic document examiner might make the determination that a particular character or feature is not present or that an item is lacking in suitability. It is at the discretion of the examiner to discontinue the procedure at any point or continue with the applicable procedures to the extent possible. The reason(s) for such a decision shall be recorded.

**4.5.6** Determine whether the submitted questioned impression(s) was produced by a stamping device. If not, discontinue the examination.

**4.5.7** Determine whether the examination is a comparison of questioned impression(s) to known impression(s) or a comparison of questioned impression(s) to questioned impression(s). If known

impressions are submitted, the forensic document examiner shall request the stamp that produced the known impressions.

**4.5.8** Based on the submission(s) and communication(s) with the submitter, clarify the question(s) to be addressed and the examination(s) to be undertaken.

**4.5.9** Form two or more mutually exclusive hypotheses, propositions, or explanations (hereinafter “hypotheses”) for each set of comparisons. There are typically two competing hypotheses, with associated sub-hypotheses, for each set of comparisons.

**4.5.9.1** Commonly encountered hypotheses which, when mutually exclusive, may be combined as competing hypotheses for evaluation include:

- a) the questioned stamping device impression was produced by the known stamping device;
- b) the questioned stamping device impression was not produced by the known stamping device.

**4.5.9.2** It is appropriate to evaluate additional hypotheses and sub-hypotheses such as duplication of the stamping device or the stamping device impression.

**4.5.9.3** Determine whether the submitted questioned impression(s) is suitable for comparison relative to the hypothesis. If it is not suitable, discontinue the procedure and report accordingly. Factors that affect suitability can include, but not be limited to, clarity, detail, degree of inking, or condition of the document.

NOTE Limited sufficiency, comparability of the impressions, and submission of non-original material can be restrictive factors in an examination and its conclusions, but they do not necessarily require the discontinuation of the examination.

**4.5.10** The procedures in this section can be used for the examination of the questioned stamp impression(s).

**4.5.10.1** Examination of the original stamp impression is preferable, and consideration shall be given to obtaining the original stamp impression, if not submitted.

**4.5.10.2** If non-original stamp impressions were submitted, determine whether the details have been reproduced with sufficient clarity for comparison purposes. Proceed to the extent possible noting that there are inherent limitations associated with examining non-original stamp impressions. If the reproduction is not of sufficient clarity for comparison purposes, discontinue these procedures and report accordingly.

**4.5.10.3** Examine the original questioned stamp impression for characteristics of duplication by electronic or other means.

NOTE Characteristic of a duplicate stamp impression: the randomly acquired characteristics (RACs) such as cuts, gouges, or wear will reproduce with smooth edges instead of rough and jagged areas in the impression produced from the original stamp.

**4.5.10.4** Perform an analysis of the questioned stamp impression.

NOTE Class characteristics should be examined in the impression. Note the substrate used. RACs should be noted. The reproduction of an individual RAC may not reproduce in every impression because reproduction is dependent upon

the size and shape of the individual characteristic as well as its location on the die, and the amount of pressure and ink applied during production of the impression.

**4.5.11** The procedures in this section can be used for the examination of the known stamping device and the production of known stamp impressions.

**4.5.11.1** If a stamping device(s) is submitted, its condition should be noted (clean, dirty, inked, worn, damaged). Note the stamp manufacturer's name on the stamp handle or container (if present). Other features include whether the stamp is a hand stamp, self-inking stamp, or a pre-inked stamp, the material used for the die, and whether the typeface is raised or flat.

**4.5.11.2** Examine and note RACs.

**4.5.11.3** If the stamping device is a hand stamp and the ink pad was not submitted, request it.

**4.5.11.4** Consideration should be given to sampling the ink from the stamping device prior to taking exemplars.

**4.5.11.5** Compare class characteristics on the die of the stamping device to the questioned stamp impression. If different from questioned impression, discontinue and report accordingly.

**4.5.11.6** Prepare exemplars suitable for comparison from the submitted known stamping device(s). The objective of each set of impressions is to obtain the range of variation in a stamp die as well as to reveal the presence of RACs that may not appear in heavily inked impressions or may not be revealed at differing angles.

NOTE The substrate may help to determine the type of ink (aqueous or oil-based) that was used to produce the impression. Among other features to consider is whether the substrate is porous or non-porous with a smooth, textured, flat, round, or curved surface.

**4.5.11.6.1** Obtain substrate material for making known impressions that is most similar to the substrate used for the questioned impression(s).

**4.5.11.6.2** If not submitted, obtain the ink containing similar characteristics as the ink used for the questioned impression(s).

**4.5.11.6.3** If the stamp is a hand stamp, impress the die into the ink pad to obtain ink coverage.

**4.5.11.6.4** If the stamp is a self-inking stamp, hold the container upside down and press the edge of the bottom of the container. The inked die will rotate away from the internal ink pad into the position for inking onto the substrate. Self-inking containers have a locking mechanism on the side of the container. Lock the container so the die will remain in position to be pressed onto the substrate.

**4.5.11.6.5** Ink the stamp and produce a first generation impression followed by a second, third, and fourth generation impressions without reinking the die. These impressions are produced at varying angles by rocking the stamp back and forth on the substrate and by changing the pressure applied during stamping. Re-ink the stamp and repeat this procedure as needed.

**4.5.11.6.6** The heaviest inking will be in the first impression. Continue impressing the die onto the paper producing progressively less inked impressions.

**4.5.11.6.7** Obtain multi-generation stamp impressions from hand stamps and self-inking stamps. Stamps where the die and the ink are one unit, for example, gel stamps and flat die stamps, will only have first generation impressions.

**4.5.12** The procedures in this section can be used for the examination of known stamp impressions.

Examine the known stamp impressions for characteristics of duplication: RACs such as cuts, gouges, or wear will reproduce with smooth edges instead of rough and jagged areas in the impressions that were produced from the original stamp.

**4.5.13** The procedures in this section can be used for the comparison of stamp impressions (questioned to known stamp impressions or exclusively questioned).

**4.5.13.1** Evaluate the comparability of the stamp impressions.

**4.5.13.2** Features that can limit comparability include size, design, and contemporaneousness.

**4.5.13.3** If the stamp impressions are not comparable, discontinue comparison and report accordingly.

NOTE A lack of contemporaneous stamp impressions can adversely affect the accuracy of the examination results. The consideration of the quality of any known stamp impressions submitted that are closest to the item(s) in question may indicate if more contemporary stamp impressions should be requested.

**4.5.13.4** Conduct a side-by-side comparison of the questioned stamp impressions, or of the questioned stamp impression to the known stamp impressions and/or to the stamping device(s).

**4.5.13.5** Compare class characteristics (size, type style, text, shape). If different, discontinue and report accordingly.

**4.5.13.6** Compare RACs (wear and damage, reproducible blemishes, impression voids, improper and extraneous inking, or coincidental peripheral printing).

**4.5.13.7** Evaluate similarities, differences, and limitations of each impression. Determine their significance individually and in combination.

**4.5.13.8** Consider the results of the above analyses, comparisons, and evaluations in relation to the competing hypotheses based on the characteristics, features, or information under observation as interpreted with the knowledge, skills, and abilities acquired through appropriate education, training, and experience.

**4.5.13.9** Form a conclusion for each set of comparisons with respect to the extent that the results of the above analyses, comparisons, and evaluations support one hypothesis over the alternative(s) and report in accordance with the criteria in section 4.6.

**4.5.14** The procedures in this section can be used for the review in accordance with applicable standards and policies.

Review all observations, comparisons, evaluations, and relevant documentation.

## **4.6 Report**

**4.6.1** The conclusion(s), or opinion(s), or observation(s) may be reached after following the appropriate procedures outlined in this standard. The number and nature of the examinations required are dependent on the question(s) at hand.

**4.6.2** The bases and reasons for the conclusion(s), and opinion(s), shall be included in the examiner's documentation and summarized in the report.

**4.6.2.1** When the examination reveals no significant, inexplicable differences between two or more items and there is agreement in all class characteristics and RACs, an identification is appropriate (that is, compared impressions or compared impression and rubber stamp contain substantial significant similarities; there are no differences; and no limitations associated with absent characters; and any possibility of a duplicate rubber stamp can be eliminated).

**4.6.2.2** If significant, inexplicable differences between two or more items are found at any level of the analyses, an elimination is appropriate (that is, the impressions contain substantial significant, inexplicable differences). There may be similarities.

**4.6.2.3** When there are limiting factors and the examination reveals similarities or differences of limited significance between two or more items, the use of qualified opinions can be appropriate (that is, the impressions or observed features contain limited similarities or differences; or limitations associated with absent characters, class characteristics and RACs, or distorted impressions are present; or limitations associated with the possibility of the existence of a duplicate rubber stamp; or a combination of these). This opinion requires explanation of the limiting factors.

**4.6.2.4** When there are significant limiting factors, and the examination reveals no significant differences, a report that no conclusion can be reached is appropriate (that is, the impressions or observed features contain insufficient significant similarities and insufficient differences). This opinion requires explanation of the limiting factors.

## Annex A (informative)

### Bibliography

This is not meant to be an all-inclusive list as the group recognizes other publications on this subject may exist. At the time this standard was drafted, these were the publications available for reference. Additionally, any mention of a particular software tool or vendor as part of this bibliography is purely incidental, and any inclusion does not imply endorsement.

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<https://www.nist.gov/topics/forensic-science/forensic-document-examination-subcommittee>  
<http://www.swgdoc.org/index.php/standards/published-standards>

SWGDOC *Scope of Work of Forensic Document Examiners*, 2013

*SWGDOC Terminology for Expressing Conclusions of Forensic Document Examiners, 2013*

*SWGDOC Terminology Relating to the Examination of Questioned Documents, 2013*

*SWGDOC Standard for Examination of Rubber Stamp Impressions, 2013*



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