



GUIDELINE FOR THE INITIAL INSPECTION, SEARCH AND RECOVERY OF FORENSIC PAINT EVIDENCE

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GENERAL REMARK

This guideline assumes prior knowledge in the forensic discipline. It is based on consensus among the relevant forensic experts and reflects the accepted practices at the time of writing. The requirements of the judicial systems are addressed in general terms only.

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1. AIMS

This guideline applies to the analysis of coating materials and is meant to be used in conjunction to the Best Practice Manual for the Forensic Examination of Paint EPG-BPM-001 [1]. It is intended to provide an understanding of the requirements, benefits and limitations of inspection, search and recovery techniques available for use by forensic paint examiners.

2. SCOPE

This guideline provides recommendations and basic information about the treatment of exhibits, searching for relevant trace materials and recovery of appropriate traces in the laboratory.

3. TERMS AND DEFINITIONS

For the purposes of this guideline, the relevant terms and definitions are given in ENFSI documents, in ILAC G19 [2], in ISO/IEC 9000 [3], ISO/IEC 17020 [4] and ISO/IEC 17025 [5] standards, in ASTM E1610-18 [6] and in ASTM E1459-13 [7] are applied.

4. INTRODUCTION

This guideline provides a procedure for the receipt, handling, protection, storage, retention and disposal or return of exhibits, including all provisions necessary to protect their integrity.

It does not cover crime scene sampling, handling and management.

Handling shall consider other evidence types that might be present on the exhibit and, if needed, additional information should be requested from the submitter in order to avoid contaminating or destroying evidence other than paint.

5. HANDLING OF EXHIBITS

Exhibits submitted to the laboratory shall be suitably packaged and be treated in order to avoid contamination. Due care is taken to protect other traces potentially present on the item.

5.1 Packaging

Correct packaging of exhibits should ensure their physical and chemical integrity, and provide a documented chain of custody.

Paint flakes can be suitably packaged in self-sealing or zip-lock plastic bags or in screwcap sealed plastic containers.

Paint samples on gelatine foil can be packaged in suitably sealed paper envelopes.

Larger items shall be packaged in security tape sealed plastic bag(s) if possible. When the item (e.g. a car bumper) does not allow this type of packaging, pertinent zones should be protected by plastic or paper wrapping.

Clothing items shall be packaged individually in paper bags sealed in such a way that all gaps are covered and secure.

Example: folded bags should be sealed with adhesive tape along all open edges and not by stapling. If bags with stitched ends are used they too should be covered in tape.

5.2 Contamination prevention

Consideration of the anti-contamination precautions that are appropriate should be based not only on those for paint examinations but for all evidence types that may be potentially available (e.g. DNA, fingerprints, textile fibres).

The items shall be checked on receipt at the laboratory and before commencement of any examination to ensure that their integrity has not been compromised. Any deficiency in the packaging that may compromise the value of a laboratory examination can be grounds for refusal to carry out the laboratory examination.

Laboratory manipulation shall be undertaken one exhibit at a time, on rigorously cleaned surfaces and considering other kinds of trace materials potentially present according to the context of the case and the scope of the request. Other items should at this point still be carefully packaged.

Laboratory examiners shall take care to avoid paint transfer between items and between the items and the examiner (secondary transfer risk).

Laboratory tools (e.g. scalpel and forceps) should also be rigorously cleaned between different items. When using additional equipment (e.g. photo camera, stereomicroscope, forensic light sources) the risk of secondary transfer should be considered.

6. SEARCH AND RECOVERY

It is usually preferable to start by searching at the location on the items where the finding of paint may have the most evidential significance.

Example: in a hit and run case the finding of paint smears on the victim's clothes at the location of impact may be of more evidential significance than minute loose paint particles found in the seams of the clothing.

Paint fragments for examination are typically small and require the use of a stereo microscope and forceps or other instruments to locate, recover and manipulate them. Low power microscopy can be used to observe the location and morphology of minute paint particles or smears *in situ*.

Paint may be recovered in the laboratory by sampling with a scalpel and/or using a pair of forceps. This is the preferred way to collect and document paint fragments if knowledge of their position on the exhibit is important for the interpretation of the results.

Paint fragments may also be collected by taping the exhibit with gelatine foil. Other adhesive tapes are less suitable because their higher sticking power causes larger or brittle paint fragments to break down during retrieval, and because of the interference of the adhesive (mostly acrylic) during the paint characterisation process.

Combing, brushing, shaking, vacuuming or scraping may also sometimes be used for paint recovery.

Brushing may sometimes be a useful alternative for collecting paint from areas that are heavily contaminated with dirt and debris (e.g. uncarpeted floors, commercial vehicles, etc.).

Paint particles on clothing items can be dislodged using a spatula, then the clothes are shaken to release any paint fragments embedded in the textile structure. This method is effective but does not permit locating the fragments on the exhibit. It can be used after microscopic examination and retrieval of locatable fragments.

Vacuuming is a recovery technique in which huge amounts of background material are collected. This can mask and coat the trace material of interest with dirt. The amount of debris collected makes it difficult to search the recovered material efficiently. No detailed information about the exact point of recovery of the trace material is provided.

Scraping with a knife or scalpel is to be avoided when collecting paint samples from large coated areas (e.g. collecting original paint from a car panel). Cutting through the paint and prising off flakes of paint is preferable.

7. MAINTAINING THE CHAIN OF CUSTODY

In order to maintain the chain of custody, it is essential to be able to prove who has handled which item and what he/she did with it.

Each item submitted and all samples recovered from it shall be unambiguously labelled and logged appropriately, from the submission to the laboratory until their return to the customer/client.

Items or samples that have been consumed during analysis should be explicitly mentioned in the case file and reported to the customer/client.

8. REFERENCES

- [1] EPG-BPM-001, Best Practice Manual for the Forensic Examination of Paint, version 2, 2022.
- [2] ILAC G19:06/2022, Modules in a Forensic Science Process.
- [3] ISO/IEC 9000:2015, Quality management systems – Fundamentals and vocabulary.
- [4] ISO/IEC 17020:2012, Conformity assessment – Requirements for the operation of various types of bodies performing inspection.
- [5] ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories.
- [6] ASTM E1492-11 (Reapproved 2017), Standard Practice for Receiving, Documenting, Storing and Retrieving Evidence in a Forensic Science Laboratory.
- [7] ASTM E1459-13 (Reapproved 2018), Standard Guide for Physical Evidence Labelling and Related Documentation.

9. AMENDMENTS TO PREVIOUS VERSION

Not applicable.