

Bell-Ringer

Forensic Science

A body is discovered in a field with moderate maggot growth on the hands, chest and mouth. How can you determine the time/date of death?

Paint and Forensic Science

How do they connect?

- The most common use of paint analysis involves the hit-and-run or an automobile murder.
- Other situations arise when a victim has been murdered and moved to another location (where paint from the actual murder has been carried on the victim to a new location and when paint or varnish dust from the air adheres to the clothing of the suspect).

- Paint is defined as a protective chemical coating which adheres to substrate's surface area.
- The thickness of the coating ranges from less than a thousandth of an inch (Fine Lacquers) to many thousands of an inch (Latex and Acrylic Products).
- Most vehicles are painted with acrylic enamels and lacquers. The finished process requires many coats to provide the metal with protection from rust.

That great to know, but...

- Each of these layers of paint can be viewed in cross section with a light microscope.
- House paints range from oil based enamels and lacquers to water based latex and acrylic finishes.
- In general, oil requires an oil-based primer to properly adhere to the surface with subsequent finish coats of either enamel or latex/acrylic finishes.
Masonry and interior drywall or plaster requires a water based primer to prepare the surface for the final finish coats of paint.

AlllllRighty Then!

- Forensic technicians who specialize in paint analysis and solubility and chemical composition of paint.
- They, with the help of many paint manufacturers, are able to identify the type of paint, the pigmentation, and chemical filters used by the paint companies.

Since there are so many types..

- Of primers and finish products available, each painted surface poses a unique combination of different chemical layers. When these layers can be matched with the layers from fragments of paint recovered from an object or a suspect's clothing, the object or suspect can be linked to the crime scene.
- In most cases, however only class characteristics can be demonstrated (the paint fragment recovered from the suspect contains the same type of paint found at the crime scene).

The United States Bureau of Standards...

- Working with automobile manufacturers, maintains reference standards of paints used on all later model vehicles.
- Foreign and older model American cars are not represented.
- The use of comparison is one form of analysis used while a sample is compared to a known standard collected at the crime scene.
- This comparison may be physical (where texture, coloring, stratification, and blemish or scratches are matched) and/or chemical analysis (to determine the type of pigment and filler used).

The Evidence

- **The area of evidence in question should be first photographed and sketched. When paint samples for comparison are collected , they should be chipped of rather than scraped.**
- **The layer structure of paint is altered when it is scraped which makes identification more difficult. Care should be taken to include any primer with the paint.**
- **They should be picked up carefully with a pair of tweezers or scooped up with a clean piece of paper.**

Continued...

- The paint chips should then be transferred to a clean plastic or glass vial with a screw top lid.
- Paper envelopes may have tiny openings in their seams allowing tiny paint fragments to fall out.
- Two paint samples should be taken: **One from the damaged area** and **one from the which is adjacent to the damaged area** should be taken for analysis.

Therefore...

- In hit-and-run cases, two paint samples should be collected from both vehicles (assuming the second vehicle has been located).
- One sample should include the damaged area and the other sample should be close to, but not including the damaged area. The damaged area should contain tiny fragments of paint from the other vehicle which can be used to compare with fragments of paint recovered at the crash site or actual paint recovered from the other vehicle.