

# TECHNICAL NOTE

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## A Rapid Method for Cross-Sectioning of Multilayered Paint Chips

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**REFERENCE:** Petraco, N. and Gale, F., "A Rapid Method for Cross-Sectioning of Multilayered Paint Chips," *Journal of Forensic Sciences*, JFSCA, Vol. 29, No. 2, April 1984, pp. 597-600.

**ABSTRACT:** A simple method for the cross-sectioning of paint chips is presented. The technique employs the use of a miniature ice cube tray and polyester resin. It has proved to be valuable in forensic science cases that involve the examination and comparison of paint chips.

**KEYWORDS:** forensic science, paints, comparative analyses

Accurate documentation of multilayered paint chips is important to the forensic examination and comparison of questioned and known samples. Various methods for exposing the stratigraphic structure have been reported [1-5]. Crown suggests embedding each chip in a cube of cold-setting polyester resin [6]. Once cured, the block is shaved or polished to expose the layer structure. Although detailed procedures have been described, we have recently developed an improved method for rapid cross-sectioning of paint chips that gives high-quality sections.

### Method and Materials

After preliminary examination of the multilayered paint chip, a small drop of nitrocellulose glue is applied to its cross section. (Duco<sup>®</sup> cement is suitable because it is quick drying and is nonreactive with most paint resins.) The cross section of the chip is positioned in the center of a small compartment (12.7 mm [1/2 in.] square) of a polyethylene ice cube tray and glued to the bottom; the chip is held upright until the cement has dried (approximately 1 min). A 2-mL aliquot of catalyzed polyester casting resin is poured into the cell and allowed to harden under a fume hood or in a well ventilated area. After the cured resin cube has been removed from the tray, the stratigraphy of paint layers is exposed by sanding and polishing the bottom surface of the cube with increasingly fine grades (320, 400, 600) of 3M<sup>®</sup> silicon carbide paper. The layer structure can then be viewed with a low magnification stereo microscope or a comparison microscope equipped with epi-illumination.

Received for publication 16 March 1983; accepted for publication 21 June 1983.

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FIG. 1—All the equipment necessary for preparing cross sections.

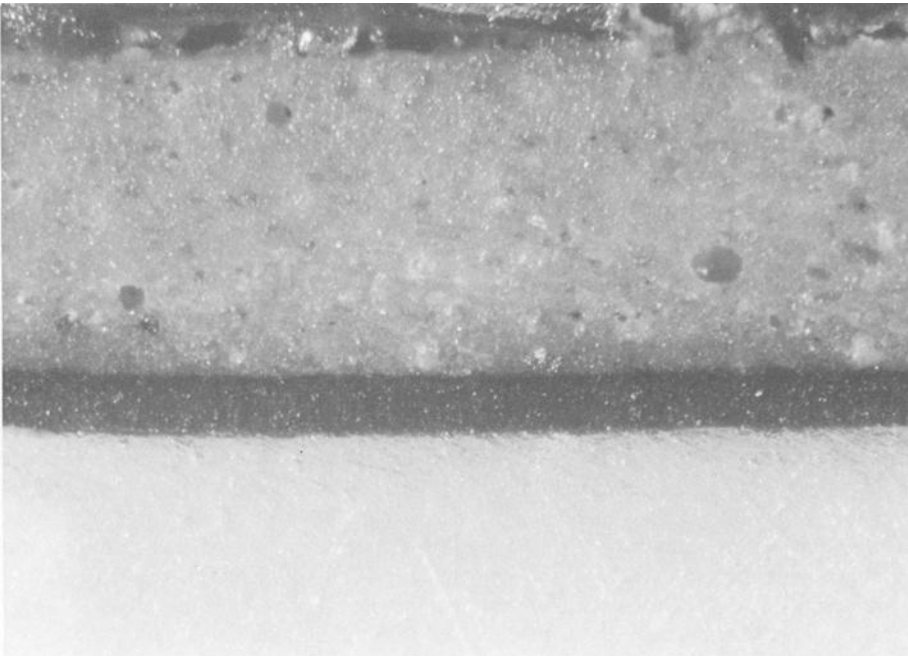


FIG. 2—A cross section of an automotive paint sample which was removed from the clothing of a vehicular homicide victim.

Figure 1 shows all materials required for preparing the cross sections. Figures 2 and 3 depict two cases in which the procedure has been successfully used.

### Results and Discussion

We believe that this technique provides the forensic scientist with a valuable procedure for paint examinations. The cross sections obtained allow the criminalist to clearly see the number of paint layers, the sequence of colors, the thickness of each layer, and the inclusion of foreign substances or weathering products between the layers. If additional analysis is required, a small portion of any individual layer can be removed by scraping with a fine tungsten needle.

As the miniature ice cube tray has 90 compartments, the procedure has been a valuable time-saver in cases that involve large numbers of specimens. The method has also been useful in the examination of thin or distorted chips as are often encountered in vehicular accidents. If a thin section is needed, the polyester resin holds the specimen firmly in place for sectioning with a microtome. Finally, the embedded paint chip provides the criminalist with a permanent and easily stored record of the evidence.

### Conclusion

This technique has proved to be valuable in forensic science cases that involve the examination and comparison of multilayered paint chips. It can be quickly and easily performed with inexpensive equipment. The criminalist can obtain high-quality cross sections which meet all the requirements of most forensic science examinations.

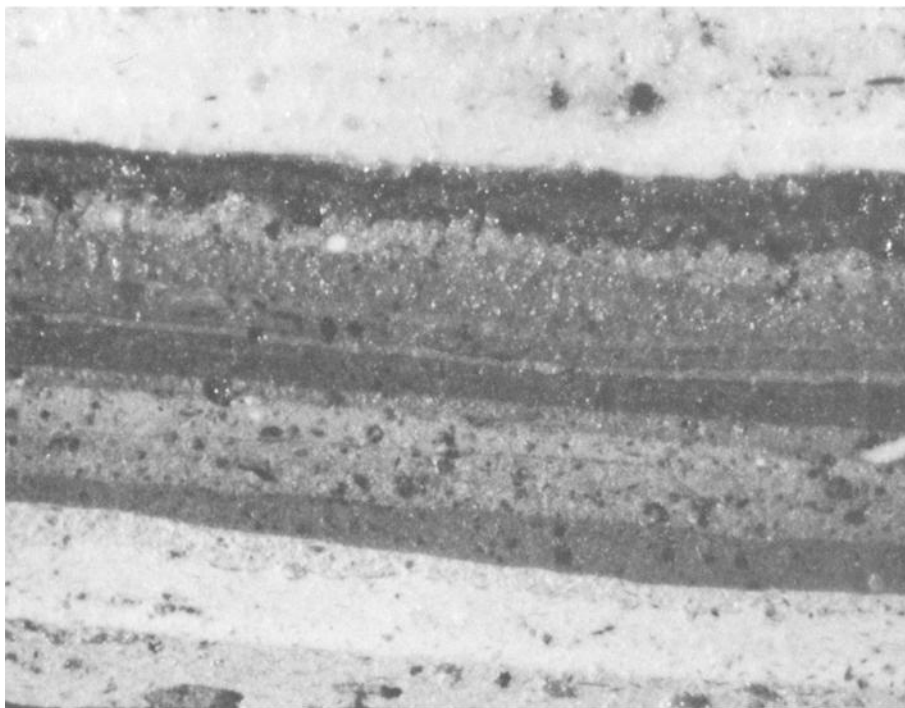


FIG. 3—A cross section of an architectural paint specimen removed from a burglary tool.

**References**

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