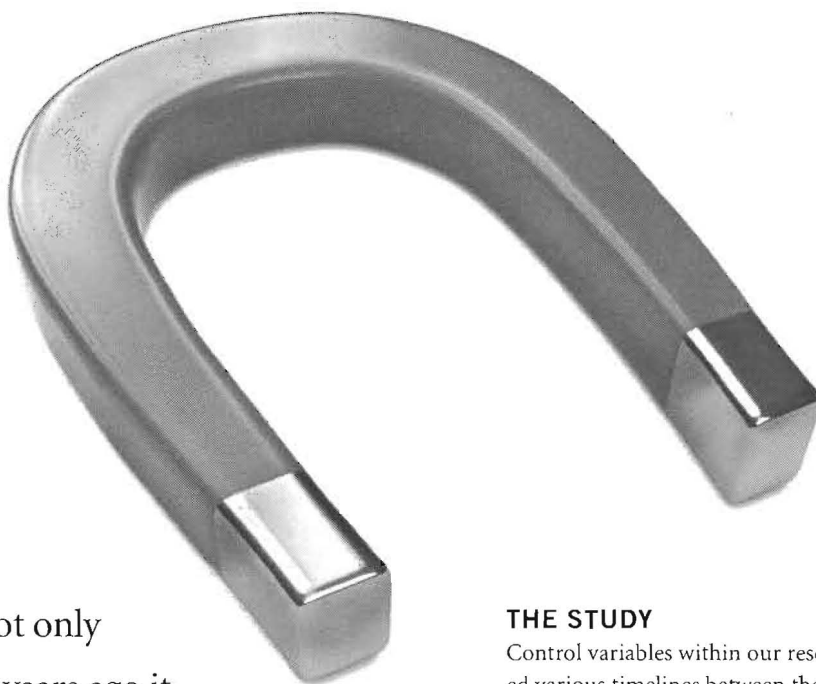


# The Versatility and Effectiveness of Magnetic Powders on Paper

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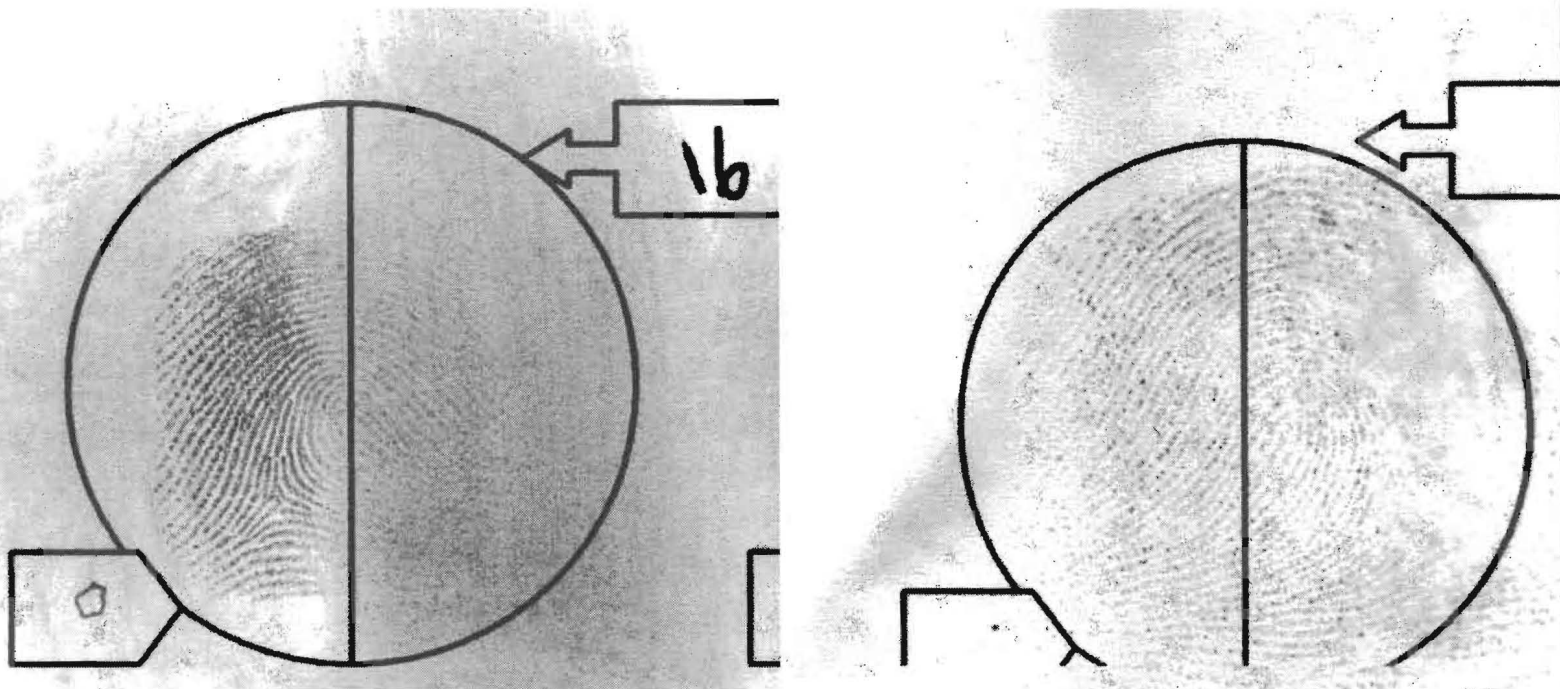


The mother of invention is not only necessity but surplus. Several years ago it discovered that the Crime Scene Unit of the Lynchburg Police Department, had purchased over 60 pounds of magnetic powders (20+ jars). Not fully understanding the capabilities of magnetic powders, a research project was initiated. With the aid of departmental interns, different magnetic powders were researched and their effectiveness on various surfaces under various conditions was analyzed. After two years of research it was found that unconventional applications of magnetic powder proved very successful and practical, especially for various evidence surfaces processed at the crime scene.

## THE STUDY

Control variables within our research included various timelines between the deposition of fingerprint residue and latent development, different paper surfaces, strong and weak deposits, and different magnetic powders. Results showed that standard black magnetic powder (not the ultra fine brands) is very effective on virtually any paper surface, proves itself unbelievably hardy once developed, and if treated soon after contact, it yields superior results than that of the conventional use of iodine treatments or silver nitrates.

In these experiments paper samples were used in which deposited latent fingerprints from different contributors were cut in half, allowing for a right side to be developed independently from the left and processing the halves at different intervals. Comparing quality and detail variances over time, we concluded that most any paper item of evidence with latent fingerprints deposited within the past two days can be effectively processed using magnetic powder. Latent fingerprints considered to have substantial



Left: The effective development of a latent print on paper; both halves were treated at once using ninhydrin 16 days after the latent print was deposited on the paper.

Right: A magnetic powder developed latent print on paper 16 days after the latent print was deposited.

residue deposition had strong results eight days later using magnetic powder, whereas silver nitrate and iodine crystals yielded poor results after time, with entire areas within the prints yielding no developed detail. A single magnetic powder developed latent fingerprint on paper was used as a control, with the latent fingerprint being handled multiple times a week for two years and still it maintained developed identifiable ridge detail.

### THE RESULTS

Since this discovery magnetic powder has been used to develop latent prints on virtually all types of paper evidence as long as the latent prints are "young" latent prints and indented writing is not a key issue. From suicide notes, threatening letters, to the paper at crime scenes thought to have been touched or stepped on by suspects, magnetic powder has proven remarkably effective in developing impressive latent prints as well as footwear impressions on paper, even several days after the contact. Surprisingly, magnetic powder has also yielded the added bonus of indented

writing on thermal paper (the shiny receipt paper). If indented writing on regular paper is a desired analysis, the use of magnetic powders should be avoided. Magnetic powders have been most effective for developing footwear impressions on paper at crime scenes that involve oily or greasy environments, or in instances where the suspect may transfer a substance from his shoe. Bowling alleys (oil), movie theaters (butter), and fast food restaurants (grease) have all yielded excellent results from this unconventional application. Porous surfaces like ceiling tiles and certain wooden surfaces have also responded well to magnetic powder.

Because ninhydrin, a common first choice for developing latent prints in paper, reacts to the amino acids within the latent print residue, ninhydrin is the obvious choice for latent prints deposited several weeks or months earlier. Ninhydrin is often the first choice for most labs for this very reason. In an experiment completed in May of 2003, it was found that even after 16 days, faint but good quality latent prints could still be successfully de-

veloped from paper using magnetic powder. Applying ninhydrin after magnetic powder revealed positive results and complemented the processing of items with magnetic powder by reacting to what was "in" the paper and not just "on" the paper. Of course, any time ninhydrin is employed, one-to-one photographs of the latent prints should be taken due to the natural fading that will occur over time.

### CONCLUSION

Magnetic powders are cost effective since virtually all powder is recoverable and reusable, easy to use, and less messy. In addition, magnetic powders do not possess the same potential carcinogenic risk as do some chemicals and traditional black powders. Once developed on paper, latent prints prove surprisingly hardy and maintain development even if repeated friction contact is sustained. Although magnetic powder is not new, the positive results yielded in these experiments should increase consideration by one's department in choosing magnetic powders to develop latents on paper. ★