

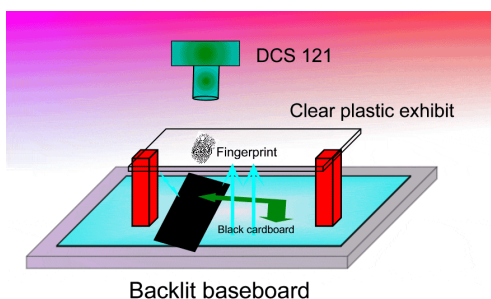
Ridgeology & Poroscopy



One of the newest areas of fingerprint research has been into the evidential capabilities of third level detail. Here the expert is not specifically analysing the fingerprint characteristics, rather they are studying the pores and the outlines of the fingerprint ridges. Whether or not this becomes an accepted science for the legal domain is a point of conjecture, but can digital image enhancement improve our capabilities to analyse this type of evidence?

Look at the fingerprint shown above:-

This fingerprint has been developed on clear plastic with cyanoacrylate fuming. The level of third level detail that can be recovered is very dependant on the chemical treatments used and the subsequent quality of the mark. If for example the fingerprint has been stained with Basic Yellow the dye often obscures the pore detail. To maximise the quality of the fingerprint I have lit it from behind on the baseboard as seen in the diagram below:-



The fingerprint was photographed on the DCS 121 with the resolution set to 100%. It was subsequently authenticated using the Veridata algorithm.

Once the fingerprint had been acquired it was placed into the 'digital darkroom' ([Image Pro Plus](#)) for processing. Here I followed the following steps:-

1. Application of a sobel filter.
2. The image was inverted.
3. Thresholding was applied to the image to remove some of the grey scale values.

The fingerprint is now ready for analysis and can be printed at any size the user requires. For some of our examinations I have printed the images out on A4 acetates, where the quality has been approved by our Fingerprint Experts.

I have even photographed third level detail with the DCS121 on aluminium lifts.