

USING THE TFD-2 TO DEVELOP LATENT FINGERPRINTS ON PAPER

Traditional methods of developing latent fingerprints on paper can be time consuming and involve the usage of hazardous chemicals. The Foster + Freeman Thermal Fingerprint Developer (TFD-2) provides a fast, chemical free screening method for the development of latent fingerprints on paper.

It has been found that heating paper with latent fingerprints present will cause the fingerprints to fluoresce. When a fingerprint is present on the paper a mixture of proteins, amino acids and inorganic material within the eccrine sweat from the fingerprint combine with paper fibres to fluoresce before the rest of the paper fluoresces^[1]. Once the paper has been treated with the TFD-2 the fluorescent fingerprints are then viewed using the Blue or Blue/Green Foster + Freeman **Crime-lite 82S** and the correct viewing filter.

Using the TFD-2 principle it is possible to develop fingerprints that are up to 12 weeks old^[2]. The results can be enhanced following the TFD-2 process by using Physical Developer (PD).

Test and Results

The TFD-2 requires the user to determine the appropriate scan speed for the document to be examined. There are several factors that will affect the speed selected. They are:

- Paper thickness: A thicker piece of paper may require a slower speed to be used.
- Paper density: A denser piece of paper (represented in g/m^2) may require a slower speed to be used.
- Paper type: A semi-gloss type of paper may require a different speed to a plain piece of office paper.

Therefore it is recommended that, wherever possible, a user determines the required speed with a control piece of paper. The user is also able to adjust the power of the heating on the TFD-2 but it is recommended to only adjust the speed to reduce the number of variables.

Foster + Freeman have tested the TFD-2 on different paper types that are typically examined by forensic fingerprint development laboratories. Fingerprints developed using TFD-2 are shown by ✓ and fingerprints not developed by TFD-2 are shown by ✘.

This is not an exhaustive list of types of paper that can be used with TFD-2. It is a guide to aid a better understanding of its applications.

Sample Type	Result
White office paper	✓
Printed white paper	✓
Post-It Note	✓ ¹
Newspaper	✓
Semi-gloss paper	✓
Gloss paper	✘
Thermal paper (e.g. receipt)	✓ ²
Cardboard	✘
Bank notes	✓
Thick (200g/m ²) white paper	✓
White envelope	✓
Brown envelope	✘
Business card	✘

¹ Development must be carried out at a lower power for more than one scan on TFD-2

² A slower speed will reveal the fingerprints on thermal paper. The fingerprints may also become visible naturally.

Conclusion

The TFD-2 was able to rapidly develop fingerprints on several commonly encountered paper documents with good results. The user should be aware of the following points:

- As with any fingerprint development technique the fingerprint donor will have a large impact on the quality of the results.
- Documents that have a lot of printing/ink on may not yield fingerprints using the TFD-2 due to poor contrast between the ink and fingerprint.
- Paper itself will fluoresce if heated to a sufficiently high temperature; therefore it is important to not go too slow with the scan speed when using the TFD-2.
- The paper substrate may vary through different production lines, which may affect the quality of the results.
- It will be easier to find fingerprints if the user is 'dark light' adjusted.

References

[1] A.J. Dominick, N.N. Daeid, S.M. Bleay, V.Sears, Recoverability of fingerprints on paper exposed to elevated temperatures. Part 2. Natural Fluorescence, J. Forensic Identification 59 (2009) 340-355

[2] D.F. Song, D. Sommerville, A.G. Brown, R.G. Shimmon, B.J. Reedy, M. Tahtouh, Thermal development of latent fingermarks on porous surfaces – Further observations and refinements, Forensic Science International 204 (2011) 97-110

Head Office & UK Sales Office:

Foster + Freeman Ltd

Vale Park, Evesham,

Worcestershire, WR11 1TD UK

+44(0)1386 768050

+44(0)1386 765351

sales@fosterfreeman.com

USA Sales Office

For enquiries from the USA and Canada

888 445 5048

888 445 5049

<http://www.fosterfreeman.com>