



B136 Determining the Sheddability of Various Fiber Types

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The goal of this presentation is to present to the forensic community a reliable method for determining the shedding potential of garments.

Fibers are frequently recovered as evidence in criminal cases. The number of fibers obtained can vary from a single fiber to a large clump. The application of the shedding potential of a garment is very significant, for example, in cases where the source of the fiber(s) is known.

A standard method for determining the sheddability index of various fiber types was developed. The low-adhesive backing of a 3" x 3" 3M post-it note was utilized to simulate a 'natural' shedding of the fabric. Shedding indices were determined for sole content non-dyed, dyed, and printed fabrics. Dyed fabrics and prints were used to investigate whether the application of colorant affected shedding. Fabric structures for the tested fabrics included knits and woven and nonwoven fabrics.

A raw mean shedding index was assigned for 31 tested fabrics. Shedding indices for 31 fabrics were assigned by counting the number of target fibers found on the adhesive backing of the post-it note with a compound microscope at 45X magnification. Each fabric was "post-it" noted in four different places. A raw mean shedding index was calculated from these four trials. Natural breaks occurred in the data when comparing the raw median shedding indices among all 31 fabrics. These breaks yielded 6 categories in which fabrics were placed. Those categories included high shedders, high-medium shedders, medium shedders, medium-low shedders, and low shedders. This categorization of fabrics was employed when fabrics were chosen for the fiber-transfer study.

A fiber-transfer study with the tested fabrics from each of the 6 categories as donors and white/black felt as recipients was performed and compared to the previously determined shedding index. Simulated contacts, a handshake (no contact), and a hug (friendly contact), were used as transfer conditions. Research participants were required to wear a white lab coat with a swatch of fabric (either donor fabric or white/black felt) safety pinned to the front chest area. The participants then either shook each other's hand or hugged one another. To investigate whether the number of transferred fibers decreased after a repeated number of contacts, each transfer was repeated 3 times with each of the tested fabrics using a different piece of recipient felt.

The method developed here for determining the sheddability of a fabric is efficient, reproducible, and reliable. A standard 3"x 3" 3M post-it note is sufficient for providing accurate results. The low-adhesive backing provides a comparable alternative to the taping method without pulling fibers from the fabric, which is often the case with the more aggressive adhesives, used on tape.

Fibers, Shedding, Fiber-Transfer Studies