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	<i>Document Manager: Cheryl Lozen</i>	<i>Approved By: Ryan Larrison</i>

3.8 Fiber Yarns to Fabrics

3.8.1 Introduction

The comparison of yarn to fabric requires the comparing of the physical dimensions of the questioned yarn to the physical dimensions of the yarn that composes the known fabric. If no significant differences are detected at that stage, then further examination and comparison of the fibers using the available procedures in this protocol are performed.

3.8.2 Safety Considerations

Standard Laboratory Precautions

Biohazard precautions, if applicable

3.8.3 Preparations

Standard Laboratory Practices

3.8.4 Minimum Standards & Controls

Known samples should consist of fibers from the warp, weft, course, wale, and the stitching of the fabric. Several areas may have to be sampled due to fabric construction differences, fading, etc.

Consideration should be given to collecting fibers from the victim's and the suspect's environments.

Fills, felted and non-woven fabrics need to be carefully sampled to obtain a representative known sample.

Also see 3-6 - Fiber Sampling

3.8.5 Instrumentation

Stereomicroscope

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3.8.6 Procedure or Analysis

3.8.6.1

Count the number yarns/unit length in each direction.

In this example, there are ten yarns/cm. in the parallel position and five yarns/cm. in the perpendicular position.

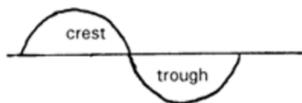
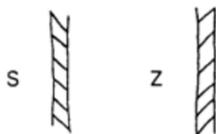
There will usually be more warp yarns/unit length than filling yarns, i.e., in the example, there are ten warp yarns/cm. and five filling yarns/cm.

3.8.6.2

Remove the warp yarn and:

3.8.6.2.1

Determine the twist:



3.8.6.2.2

Count the number of crests and trough/unit length.

On a simple over 1, under 1 weave, the number of crests and troughs in the warp yarn should equal the number of filling yarns, as determined in Step 1, in the same unit length.

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3.8.6.3

Make physical measurements on unknown.

3.8.6.3.1

If measurements differ greatly - eliminate.

3.8.6.3.2

If measurements are close - compare.

3.8.6.4

Comparisons

3.8.6.4.1

If possible, count the number of fibers in the yarns.

Construction of a yarn:

- Fibers make up a yarn.
- Two or more yarns make up a strand.

3.8.6.4.2

The warp and filling may be composed of yarns and strands and should be broken down accordingly.

Determine the composition of the warp and filling yarns.

If you have the entire garment and you can follow the pattern, you may be able to determine where a yarn is missing and possibly match your questioned yarn to that area.

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3.8.7 References

[ASTM E2225-19a Standard Guide for Forensic Examination of Fabrics and Cordage](#)

Dictionary of Fiber and Textile Technology, KoSa, Charlotte, NC, 1999