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Forensic Testing Program

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Fibers Analysis Test No. 19-539 Summary Report

Each sample set consisted of two known fabric samples and two sets of questioned fibers. Participants were requested to compare the items and report their findings. Data were returned from 102 participants and are compiled into the following tables:

This report contains the data received from the participants in this test. Since these participants are located in many countries around the world, and it is their option how the samples are to be used (e.g., training exercise, known or blind proficiency testing, research and development of new techniques, etc.), the results compiled in the Summary Report are not intended to be an overview of the quality of work performed in the profession and cannot be interpreted as such. The Summary Comments are included for the benefit of participants to assist with maintaining or enhancing the quality of their results. These comments are not intended to reflect the general state of the art within the profession.

Participant results are reported using a randomly assigned "WebCode". This code maintains participant's anonymity, provides linking of the various report sections, and will change with every report.

Manufacturer's Information

Each sample pack consisted of two sections of known fabric (Items 1 and 2) and two sets of questioned fibers (Items 3 and 4). Items 1 and 3 were from the same gray fabric labeled as 100% Rayon. Item 2 was from a gray fabric labeled as 100% Polyester and Item 4 was from a different brand of gray fabric also labeled as 100% Polyester. All fabric was purchased from a local fabric store. Participants were requested to examine the fibers, identify the fiber type, and determine if the questioned fibers could have originated from the known fabric.

SAMPLE PREPARATION-
The fabric was laid out and rolled with a lint roller to remove any extraneous debris.

ITEMS 1 AND 3 (ASSOCIATION): For the known fabric (Item 1) and the questioned fibers (Item 3), a 1-yard section of fabric was first cut into swatches. A predetermined number of full swatches were then packaged into glassine bags and pre-labeled Item 1 envelopes; the remaining swatches were used to prepare the Item 3 questioned fibers. For each item in this set, warp and weft fibers were teased from the edges of one fabric swatch, then packaged into a glassine bag and Item 3 pre-labeled envelopes.

ITEMS 2 AND 4 (ELIMINATION): For the known fabric (Item 2), a 1/2-yard section of fabric was cut into swatches. A predetermined number of full swatches were then packaged into glassine bags and pre-labeled Item 2 envelopes. For the questioned fibers (Item 4), a 1/2-yard section of fabric was first cut into swatches and warp and weft fibers were teased from the edges of the fabric swatch then packaged into glassine bags and pre-labeled Item 4 envelopes.

SAMPLE SET ASSEMBLY: For each sample set, an Item 1, 2, 3, and 4 were placed in a pre-labeled sample pack envelope. The sample pack was sealed with invisible tape. This process was repeated until all of the sample sets were prepared. Once predistribution results were obtained, all sample sets were further sealed with a piece of evidence tape and initialed "CTS".

VERIFICATION-
Predistribution laboratories reported the expected association results. All three predistribution laboratories identified the fibers in Items 1 and 3 as Manufactured Rayon and the fibers in Items 2 and 4 as Manufactured Polyester. The following procedures were used to examine the items: stereomicroscopy, comparison microscopy, polarized light microscopy, fluorescence microscopy, macroscopic exam, and IR/FTIR.

Summary Comments

This test was designed to allow participants to assess their proficiency in the examination, identification, and comparison of fibers. Participants were provided with a 2" x 2" swatch of known fabric for Items 1 and 2, and a set of questioned fibers for Items 3 and 4. They were requested to examine the submitted items and determine if either set of questioned fibers could have originated from either of the known swatches. Items 1 and 3 originated from the same gray fabric labeled as 100% Rayon whereas Items 2 and 4 originated from two different gray fabrics labeled as 100% polyester. (Refer to the Manufacturer's Information for preparation details.)

Regarding the fiber association results, 93 of the 102 participants (91%) reported results consistent with expected results and the group consensus for all item comparisons. These participants associated the Item 3 fibers with the Item 1 material and did not associate the Item 4 fibers with either the Item 1 or Item 2 materials. The remaining 9 outlier participants reported as such: Five participants associated Item 4 with Item 2. One participant was inconclusive as to the association between Item 4 and Item 2. One participant associated Item 3 with Item 2. One participant gave no response regarding the Item 3 and Item 1 comparison. One participant associated both Items 3 and 4 with Items 1 and 2 (reported "Yes" for all answers).

Regarding the fiber type determination, 86 of 102 participants (84%) reported the expected fiber types for all items. These participants reported Items 1 and 3 as consisting of Rayon and Items 2 and 4 consisting of Polyester. Sixteen outlier participants provided answers that were inconsistent with the expected results and group consensus and are broken down as such: Eight participants gave inconsistent responses for Items 2 and 4, with a majority of these reporting that they did not further characterize the sample beyond an identification of a manufactured material. Five participants gave inconsistent responses for Items 1 and 3. One participant gave an inconsistent response for Item 2 and another for Item 3. Finally, one participant gave inconsistent responses for all four items. This lab denoted that the fibers from Items 1- 4 were indistinguishable when viewed by polarized light and subsequently would be submitted for additional testing to an external forensic service provider.

Across the 102 responding participants, 584 methods of analysis were reported in total. Stereo Microscopy and IR/FTIR were the most commonly reported examination methods used. Each were reported 96 times. Another frequently reported method is Polarized Light Microscopy, reported 92 times. There was no correlation between the examination methods used by participants and the reporting of inconsistent results for fiber type determination.

Association Results

Could the questioned fibers (Items 3 and 4) have originated from either the victim's coat (Item 1) or the victim's suit (Item 2)?

TABLE 1

WebCode	Victim's Coat (Item 1)		Victim's Suit (Item 2)	
	Item 3	Item 4	Item 3	Item 4
29U8WW	Yes	No	No	No
3CUB9W	Yes	No	No	No
3EH8R4	Yes	No	No	No
3EX7RZ	Yes	No	No	No
3WXFBW	Yes	No	No	No
3XR7WX	Yes	No	No	No
46NLYB	Yes	No	No	No
48EM3D	Yes	No	No	No
4LB238	Yes	No	No	No
67ZKRY	Yes	No	No	No
68BLDX	Yes	No	No	No
6BAZ2M	Yes	No	No	No
6RE8FP	Yes	No	No	No
7BPJLK	Yes	No	No	No
7JJPEL	Yes	No	No	No
7RUJFL	Yes	No	No	No
82V4GT	Yes	No	No	No
8EJXJU	Yes	No	No	No
8R7HBV	Yes	No	No	No
8VUGJ7	Yes	No	No	No
937XMZ	Yes	No	No	No
9LXYH4	Yes	No	No	No
A33RP3	Yes	No	No	No
A67M7K	Yes	No	No	No
AC7FLM	Yes	No	No	No
ACPQEM	Yes	No	No	No
AQPRTA	Yes	No	No	No
AZBT9J	Yes	No	Yes	No
B7W9DG	Yes	No	No	No
BMM972	Yes	No	No	Yes
BTUHTX	Yes	No	No	No
BVC2DR	Yes	No	No	No
C6H2RZ	Yes	No	No	Yes
C9H876	Yes	No	No	No
C9KA3H	Yes	No	No	No
CBL6ED	Yes	No	No	No

TABLE 1

WebCode	Victim's Coat (Item 1)		Victim's Suit (Item 2)	
	Item 3	Item 4	Item 3	Item 4
D44WNV	Yes	No	No	No
D9CRGN	Yes	No	No	No
DAMU4M	Yes	No	No	No
DDL9QC	Yes	No	No	No
DYMN63	Yes	No	No	No
E9RYCR	Yes	No	No	No
EBJXN6	Yes	Yes	Yes	Yes
ECV7KN	Yes	No	No	No
EKMAFR	Yes	No	No	No
FUMZYE	Yes	No	No	No
GMJ8RA	Yes	No	No	No
GRVKLN	Yes	No	No	Yes
GZQXUG	Yes	No	No	No
H8JT6K	Yes	No	No	No
HE3VCM	Yes	No	No	No
J2WZTL	Yes	No	No	No
JT4EFF	Yes	No	No	No
JYTRJN	Yes	No	No	Yes
K3JLUU	Yes	No	No	No
KEEW6M	Yes	No	No	No
KJ9VEC	Yes	No	No	No
KQ9DUN	Yes	No	No	No
KYMA4G		No	No	No
L726EP	Yes	No	No	No
LDYADD	Yes	No	No	No
LLFBN3	Yes	No	No	No
LVJNKW	Yes	No	No	No
LYEEQ9	Yes	No	No	No
N84E44	Yes	No	No	No
NJW73A	Yes	No	No	No
NQYFA3	Yes	No	No	No
PPL37R	Yes	No	No	No
PUFZVH	Yes	No	No	Inconclusive
QPG9Y6	Yes	No	No	No
QR6HAR	Yes	No	No	No
QXRAJ7	Yes	No	No	No
R72QD4	Yes	No	No	No
RPWNRD	Yes	No	No	No
RU4AJG	Yes	No	No	No
RXQWC4	Yes	No	No	No
T9G6AW	Yes	No	No	No

TABLE 1

WebCode	Victim's Coat (Item 1)		Victim's Suit (Item 2)	
	Item 3	Item 4	Item 3	Item 4
TJ47Q7	Yes	No	No	No
TL9RHD	Yes	No	No	No
TTNFCE	Yes	No	No	Yes
TUKQCN	Yes	No	No	No
TWPJ2F	Yes	No	No	No
UGUUV4	Yes	No	No	No
UVBATF	Yes	No	No	No
V7TDDK	Yes	No	No	No
V9AAN9	Yes	No	No	No
VEH272	Yes	No	No	No
WED4DH	Yes	No	No	No
WFAJL9	Yes	No	No	No
WTCK83	Yes	No	No	No
XCNU2V	Yes	No	No	No
XHTXP9	Yes	No	No	No
XKF37Y	Yes	No	No	No
XLRGZZ	Yes	No	No	No
XPUAK6	Yes	No	No	No
YAXM3W	Yes	No	No	No
YRTDW6	Yes	No	No	No
YVB62Z	Yes	No	No	No
ZDB8H6	Yes	No	No	No
ZJX3F3	Yes	No	No	No
ZK88TQ	Yes	No	No	No
ZZ32A4	Yes	No	No	No

Response Summary Participants: 102

Could the questioned fibers (Items 3 and 4) have originated from either the victim's coat (Item 1) or the victim's suit (Item 2)?

	Item 1: Victim's Coat		Item 2: Victim's Suit	
	Item 3	Item 4	Item 3	Item 4
Yes:	101 *(99.0%)*	1 *(1.0%)*	2 *(2.0%)*	6 *(5.9%)*
No:	0 *(0.0%)*	101 *(99.0%)*	100 *(98.0%)*	95 *(93.1%)*
Inc:	0 *(0.0%)*	0 *(0.0%)*	0 *(0.0%)*	1 *(1.0%)*

Fiber Type Determination

What is the fiber type and generic name of the fiber(s) in each item?

TABLE 2

WebCode	Item 1	Item 2	Item 3	Item 4
29U8WW	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
3CUB9W	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
3EH8R4	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
3EX7RZ	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
3WXFBW	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
3XR7WX	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
46NLYB	Manufactured fibre Rayon	Manufactured fibre Polyester (PET)	Manufactured fibre Rayon	Manufactured fibre Polyester (PET)
48EM3D	Manufactured; Rayon	Manufactured; Not Further Categorized	Manufactured; Rayon	Manufactured; Not Further Categorized
4LB238	Manfactured ,Rayon	Manfactured ,Polyester	Manfactured ,Rayon	Manfactured ,Polyester
67ZKRY	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
68BLDX	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
6BAZ2M	Manufactured (Rayon)	Manufactured (Polyester)	Manufactured (Rayon)	Manufactured (Polyester)
6RE8FP	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
7BPJLK	Manufactured; Rayon	Manufactured; Polyester	Manufactured; Rayon	Manufactured; Polyester
7JJPEL	Manufactured: Rayon	Manufactured: Polyester	Manufactured: Rayon	Manufactured: Polyester
7RUJFL	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
82V4GT	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
8EJXJU	Manufactured, Rayon	Manufactured Polyester	Manufactured, Rayon	Manufactured Polyester

TABLE 2

WebCode	Item 1	Item 2	Item 3	Item 4
8R7HBV	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
8VUGJ7	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
937XMZ	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
9LXYH4	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
A33RP3	Manufactured Rayon	Manufactured Polyester	Manufactured Rayon	Manufactured Polyester
A67M7K	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
AC7FLM	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
ACPQEM	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
AQPRTA	Manufactured Rayon	Manufactured Polyester	Manufactured Rayon	Manufactured Polyester
AZBT9J	Manufactured Rayon	Manufactured Polyester	Manufactured Rayon and Polyester	Manufactured Polyester
B7W9DG	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
BMM972	Manufactured,Rayon	Manufactured,Polyester	Manufactured,Rayon	Manufactured,Polyester
BTUHTX	non delustered polyethylene	non delustered Polyester	non delustered polyethylene	delustered Polyester
BVC2DR	Manufactured - Rayon	Manufactured - Polyester	Manufactured - Rayon	Manufactured - Polyester
C6H2RZ	Manufactured,Rayon	Manufactured,Polyester	Manufactured,Rayon	Manufactured,Polyester
C9H876	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
C9KA3H	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
CBL6ED	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
D44WNV	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
D9CRGN	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester

TABLE 2

WebCode	Item 1	Item 2	Item 3	Item 4
DAMU4M	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
DDL9QC	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
DYMN63	Manufactured, Rayon	Manufactured, not further characterized	Manufactured, Rayon	Manufactured, not further characterized
E9RYCR	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
EBJXN6	Synthetic / Manufactured	Synthetic / Manufactured	Synthetic / Manufactured	Synthetic / Manufactured
ECV7KN	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
EKMAFR	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
FUMZYE	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
GMJ8RA	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
GRVKLN	Manufactured: Rayon	Manufactured: Polyester	Manufactured: Rayon	Manufactured: Polyester
GZQXUG	Manufactured - Rayon	Manufactured	Manufactured - Rayon	Manufactured
H8JT6K	Rayon	Polyester	Rayon	Polyester
HE3VCM	Rayon Manufactured	Polyester Manufactured	Rayon Manufactured	Polyester Manufactured
J2WZTL	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
JT4EFF	Manufactured - Rayon	Manufactured - Polyester	Manufactured - Rayon	Manufactured - Polyester
JYTRJN	Manufactured Rayon	Manufactured Polyester	Manufactored Rayon	Manufactured Polyester
K3JLUU	Manufactured, Rayon	Manufactured, Not further characterized	Manufactured, Rayon	Manufactured, Not further characterized
KEEW6M	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
KJ9VEC	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester

TABLE 2

WebCode	Item 1	Item 2	Item 3	Item 4
KQ9DUN	Manufactured Rayon	Manufactured Polyester	Manufactured Rayon	Manufactured Polyester
KYMA4G	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
L726EP	Rayon	Polyester	Rayon	Polyester
LDYADD	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
LLFBN3	Manufactured, Rayon	Manufactured, Nylon	Manufactured, Rayon	Manufactured, Polyester
LVJNKW	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
LYEEQ9	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
N84E44	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
NJW73A	Manufactured Rayon	Manufactured Polyester	Manufactured Rayon	Manufactured Polyester
NQYFA3	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
PPL37R	Manufactured; Rayon	Manufactured; not further characterized	Manufactured; Rayon	Manufactued; not further characterized
PUFZVH	Manufactured Rayon	Manufactured Polyester	Manufactured Rayon	Manufactured Polyester
QPG9Y6	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
QR6HAR	Manufactured, Rayon	Manufactured, Not Further Characterized	Manufactured, Rayon	Manufactured, Not Further Characterized
QXRAJ7	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
R72QD4	Manufactured; Rayon	Manufactured; Polyester	Manufactured; Rayon	Manufactured; Polyester
RPWNRD	Manufactured lyocell	Manufactured Polyester (PET)	Manufactured lyocell	Manufactured Polyester (PET)
RU4AJG	Manufactured Rayon	Manufactured Polyester	Manufactured Rayon	Manufactured Polyester
RXQWC4	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
T9G6AW	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester

TABLE 2

WebCode	Item 1	Item 2	Item 3	Item 4
TJ47Q7	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
TL9RHD	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
TTNFCE	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
TUKQCN	Manufactured; Rayon	Manufactured; not further characterized	Manufactured; Rayon	Manufactured; not further characterized
TWPJ2F	grey Manufactured Rayon	grey Manufactured Polyester	grey Manufactured Rayon	grey Manufactured Polyester
UGUUV4	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
UVBATF	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
V7TDDK	Manufactured, Rayon	Manufactured, Not Further Categorized	Manufactured, Rayon	Manufactured, Not Further Categorized
V9AAN9	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
VEH272	Rayon (Manufactured)	Polyester (Manufactured)	Rayon (Manufactured)	Polyester (Manufactured)
WED4DH	Rayon	Polyester	Rayon	Polyester
WFAJL9	Manufactured Rayon	Manufactured Polyester	Manufactured Rayon	Manufactured Polyester
WTCK83	Manufactured-Nylon	Manufactured-Polyester	Manufactured-Nylon	Manufactured-Polyester delustered
XCNU2V	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
XHTXP9	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
XKF37Y	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
XLRGZZ	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
XPUAK6	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
YAXM3W	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester

TABLE 2

WebCode	Item 1	Item 2	Item 3	Item 4
YRTDW6	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
YVB62Z	Manufactured, Lyocell	Manufactured, Polyester	Manufactured, Lyocell	Manufactured, Polyester
ZDB8H6	Manufactured, Regenerated Cellulose	Manufactured, Polyester	Manufactured, Regenerated Cellulose	Manufactured, Polyester
ZJX3F3	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manufactured, Polyester
ZK88TQ	Rayon	Polyester	Rayon	Polyester
ZZ32A4	Manufactured, Rayon	Manufactured, Polyester	Manufactured, Rayon	Manuafactured, Polyester

Response Summary Participants: 102

Item 1		Item 2		Item 3		Item 4	
Rayon:	96 *(94.1%)*	Polyester:	92 *(90.2%)*	Rayon:	96 *(94.1%)*	Polyester:	93 *(91.2%)*
Other:	6 *(5.9%)*	Other:	10 *(9.8%)*	Other:	7 *(6.9%)*	Other:	9 *(8.8%)*

Examination Methods

TABLE 3

WebCode	Stereomicroscope	Comparison	Polarized Light	Fluorescence	Macroscopic Exam	IR/FTIR	Microspectrophotometry	Solubility Tests	Cross-Section	Melting Point	Other
29U8WW	✓	✓	✓		✓	✓	✓				
3CUB9W	✓	✓	✓	✓	✓	✓	✓				
3EH8R4	✓		✓		✓	✓	✓				
3EX7RZ	✓	✓	✓	✓		✓	✓				
3WXFBW	✓	✓	✓	✓	✓	✓	✓				Raman
3XR7WX	✓	✓	✓	✓		✓					
46NLYB	✓	✓	✓			✓					
48EM3D	✓	✓	✓	✓		✓	✓				Optical Cross-Section
4LB238		✓	✓		✓	✓					
67ZKRY	✓	✓	✓	✓	✓	✓					
68BLDX	✓	✓	✓	✓	✓	✓	✓	✓			
6BAZ2M	✓	✓	✓	✓		✓					
6RE8FP	✓		✓			✓			✓		ALS
7BPJLK	✓	✓	✓	✓		✓			✓		
7JJPEL	✓	✓	✓		✓	✓	✓		✓		Thin Layer Chromatography
7RUJFL	✓	✓	✓	✓		✓	✓				
82V4GT	✓		✓	✓		✓					
8EJXJU	✓		✓	✓	✓	✓	✓				
8R7HBV	✓	✓	✓	✓	✓	✓	✓				
8VUGJ7	✓	✓	✓		✓				✓		
937XMZ	✓	✓	✓		✓	✓					
9LXYH4						✓					SEM/EDS
A33RP3					✓	✓	✓				

TABLE 3

WebCode	Stereomicroscope	Comparison	Polarized Light	Fluorescence	Macroscopic Exam	IR/FTIR	Microspectrophotometry	Solubility Tests	Cross-Section	Melting Point	Other
A67M7K	✓	✓	✓	✓	✓	✓		✓			
AC7FLM	✓	✓	✓	✓	✓	✓		✓			
ACPQEM	✓	✓	✓	✓	✓	✓		✓			
AQPRTA	✓		✓	✓		✓					scanning electron microscopy
AZBT9J	✓		✓		✓	✓		✓			
B7W9DG	✓	✓	✓		✓	✓		✓			
BMM972	✓		✓	✓	✓	✓		✓			pyrolysis GC-MS
BTUHTX	✓		✓								
BVC2DR	✓	✓	✓	✓		✓					
C6H2RZ	✓					✓					Py/GC, SEM/EDS
C9H876	✓	✓	✓	✓	✓	✓	✓	✓			Raman
C9KA3H	✓	✓		✓		✓		✓			
CBL6ED	✓	✓	✓	✓	✓	✓	✓	✓			
D44WNV	✓	✓	✓		✓	✓	✓	✓			
D9CRGN	✓	✓	✓	✓	✓	✓	✓	✓			
DAMU4M	✓	✓	✓		✓	✓		✓			Dispersion stain
DDL9QC	✓		✓		✓	✓		✓			
DYMN63	✓	✓	✓	✓	✓	✓	✓				
E9RYCR	✓	✓	✓		✓	✓					
EBJXN6	✓										LPM examination @ 40X magnification
ECV7KN	✓	✓	✓	✓	✓	✓					
EKMAFR	✓	✓	✓		✓	✓					
FUMZYE	✓	✓	✓		✓	✓					
GMJ8RA	✓	✓	✓	✓		✓		✓			

TABLE 3

WebCode	Stereomicroscope	Comparison	Polarized Light	Fluorescence	Macroscopic Exam	IR/FTIR	Microspectrophotometry	Solubility Tests	Cross-Section	Melting Point	Other
GRVKLN		✓		✓		✓					
GZQXUG	✓	✓	✓		✓	✓					
H8JT6K	✓	✓	✓		✓	✓					
HE3VCM	✓	✓	✓	✓	✓	✓	✓				
J2WZTL	✓	✓	✓		✓	✓	✓				Refractive Index
JT4EFF	✓	✓	✓	✓	✓	✓	✓	✓	✓		
JYTRJN	✓		✓			✓		✓			
K3JLUU	✓	✓	✓	✓	✓	✓	✓				
KEEW6M	✓	✓	✓	✓	✓	✓			✓		
KJ9VEC	✓	✓	✓	✓	✓	✓					
KQ9DUN	✓		✓		✓	✓					
KYMA4G	✓		✓		✓	✓					
L726EP	✓	✓	✓			✓					
LDYADD	✓	✓	✓	✓	✓	✓	✓				UV-MSP
LLFBN3	✓	✓	✓		✓						
LVJNKW	✓		✓			✓					
LYEEQ9	✓	✓	✓		✓	✓	✓		✓		
N84E44	✓	✓		✓	✓	✓	✓		✓		
NJW73A	✓	✓	✓	✓	✓	✓					
NQYFA3	✓	✓	✓		✓	✓			✓		
PPL37R	✓	✓	✓	✓		✓	✓				
PUFZVH	✓		✓		✓	✓		✓			
QPG9Y6	✓	✓	✓	✓		✓					
QR6HAR	✓	✓	✓	✓	✓	✓	✓		✓		

TABLE 3

WebCode	Stereomicroscope	Comparison	Polarized Light	Fluorescence	Macroscopic Exam	IR/FTIR	Microspectrophotometry	Solubility Tests	Cross-Section	Melting Point	Other
QXRAJ7	✓	✓	✓	✓	✓	✓	✓		✓		
R72QD4	✓	✓	✓	✓	✓	✓	✓				
RPWNRD	✓	✓	✓	✓	✓	✓			✓		
RU4AJG	✓	✓	✓	✓	✓	✓	✓				
RXQWC4	✓	✓	✓		✓	✓			✓		Alternate Light Source
T9G6AW	✓	✓	✓	✓	✓	✓	✓	✓	✓		
TJ47Q7	✓		✓	✓		✓			✓		
TL9RHD	✓		✓		✓	✓					
TTNFCE	✓					✓					
TUKQCN	✓	✓	✓	✓	✓	✓	✓		✓		
TWPJ2F	✓	✓	✓	✓	✓	✓	✓				
UGUUV4	✓	✓	✓	✓	✓	✓			✓		
UVBATF	✓					✓	✓				
V7TDDK	✓	✓	✓	✓	✓	✓	✓				Optical Cross-Section
V9AAN9	✓	✓	✓	✓		✓			✓		
VEH272	✓	✓	✓	✓	✓	✓	✓				
WED4DH	✓	✓	✓	✓	✓	✓	✓		✓		
WFAJL9	✓	✓	✓	✓		✓					
WTCK83	✓		✓		✓						
XCNU2V	✓	✓	✓		✓	✓			✓		UV light
XHTXP9					✓	✓			✓	✓	PLM
XKF37Y	✓	✓	✓	✓	✓	✓	✓			✓	
XLRGZZ	✓	✓	✓	✓	✓	✓	✓			✓	
XPUAK6	✓	✓	✓		✓	✓			✓		Alternate Light Source

TABLE 3

WebCode	Stereomicroscope	Comparison	Polarized Light	Fluorescence	Macroscopic Exam	IR/FTIR	Microspectrophotometry	Solubility Tests	Cross-Section	Melting Point	Other
YAXM3W	✓	✓	✓	✓	✓		✓		✓		
YRTDW6	✓	✓	✓	✓	✓	✓	✓		✓		
YVB62Z	✓	✓	✓	✓	✓	✓	✓				Cross-section from longitudinal view of fibres
ZDB8H6		✓	✓	✓	✓	✓	✓				UV Microspectrometry
ZJX3F3	✓	✓	✓		✓	✓	✓				Raman spectroscopy and Pyrolysis/GC/MS
ZK88TQ	✓	✓	✓		✓	✓					
ZZ32A4	✓	✓	✓		✓	✓	✓				Refractive index

Response Summary

Participants	Stereomicroscope	Comparison	Polarized Light	Fluorescence	Macroscopic Exam	IR/FTIR	Microspectrophotometry	Solubility Tests	Cross-Section	Melting Point
102	96	78	92	58	74	96	44	5	37	4
Percent	*94%*	*76%*	*90%*	*57%*	*73%*	*94%*	*43%*	*5%*	*36%*	*4%*

Conclusions

TABLE 4

WebCode	Conclusions
29U8WW	The following instruments and microscopes were used in the analysis of items in this case: Stereomicroscope, Polarized Light Microscope, Comparison Microscope, Fourier Transform Infrared Microscope (FTIR), and Microspectrophotometer (MSP). Item 1 (known) consists of gray colored rayon fibers. Item 2 (known) consists of gray colored polyester fibers. Item 3 (question) consists of light colored rayon fibers. Item 4 (question) consists of light colored polyester fibers. Comparison of known Item 1 to questions items 3 and 4: Item 1 is consistent in fiber type, color, and physical characteristics as compared to item 3. The fibers from item 3 could have originated from item 1 or from another source of fibers with the same fiber type, color and physical characteristics. Item 4 could not have originated from item 1 due to differences in fiber type. Comparison of known Item 2 to questions items 3 and 4: Item 3 could not have originated from item 2 due to differences in fiber type. Item 4 could not have originated from item 2 due to differences in physical characteristics.
3CUB9W	The known section of fabric, item 001-1, from the victim's coat is composed of rayon fibers. The questioned fibers, item 001-3, found on the suspect's knife are indistinguishable from the fibers composing the section of fabric, item 001-1, from the victim's coat. The questioned fibers, item 001-4, found on the victim's watch are polyester fiber and are a different type of fiber than those composing the fabric section, item 001-1. The known section of fabric, item 001-2, is composed of polyester fibers. The fibers in item 001-4 are polyester but are different in microscopical appearance than the fibers composing the fabric section, item 001-2. I used stereo microscopy, polarized light microscopy, fluorescence microscopy, comparison microscopy, infrared microspectrophotometry, and uv- visible microspectrophotometry in this examination. Conclusion: The questioned fibers, item 001-3, found on the suspect's knife could have come from the victim's coat fabric or another fabric made of the same type of fibers with the same microscopical and physical properties. The question fibers, item 001-4, did not come from the victim's coat or suit fabrics, items 001-1 or 001-2.
3EH8R4	All samples were analyzed with microscopy (stereo, polarized light), FTIR and microspectrophotometry. The fibers found on the suspect's knife (Item 3) could have come from the victim's coat (Item 1) and could not have come from victim's suit (Item 2) The fiberss found on the victim's watch (Item 4) could not have come from the victim's coat (Item 1) and suit (Item 2). Item 1 and 3 consisted of manufactured rayon fibers and item 2 and 4 consisted of manufactured polyester fibers.
3EX7RZ	Items 1, 2, 3, and 4 were examined by stereomicroscopy, polarized light microscopy, and infrared spectroscopy. Items 1 and 3 were additionally examined by comparison light microscopy, fluorescence microscopy, and microspectrophotometry. The light gray rayon fibers in Item 3 were indistinguishable from the light gray rayon fibers in Item 1 in color, general fiber type, and microscopic characteristics (Type 3 Association). This means the fibers found on the suspect's knife could have come from the victim's coat. Item 3 was different from Item 2 (Elimination). This means the fibers found on the suspect's knife did not come from the victim's suit. Item 4 was different from Items 1 and 2 (Elimination). This means the fibers found on the victim's watch did not come from the victim's coat or the victim's suit.
3WXFBW	1. The source of the known section of the complainant's coat (item 1) could not be eliminated as a possible source of the fibres found on the suspect's knife (item 3). As such, the fibres found on the suspect's knife (item 3) either came from the source of the known section of the complainants coat (item 1) or from other sources of fibres that are indistinguishable from the fibres comprising the known section of the complainant's coat (item 1). 2. The sources of the known section of the complainant's coat (item 1) and the known section of the complainant's suit (item 2) were eliminated as possible sources of the fibres found on the complainant's watch (item 4).
3XR7WX	Item 2 and Item 4 were found to consist of microscopically colourless polyester fibres. Based on yarn construction, microscopic characteristics, fluorescence and chemical composition of the fibres, the grey yarns from Item 3 could not be ruled out as having originated from Item 1 or other sources containing yarns with similar characteristics. Based on microscopic characteristics of the fibres, microscopically

TABLE 4

WebCode	Conclusions
	colourless polyester fibres sampled from Item 4 were found to be different from the microscopically colourless rayon fibres constituting Item 1 and the microscopically colourless polyester fibres constituting Item 2.
46NLYB	The questioned fibres in Item 3 are identical in all examined characteristics to fibres form Item 1. Item 3 could have originated from the same source as Item 1 or other source with same fibre content. The questioned fibres in Item 4 are different in all examined characteristics from the fibres in Item 1 and Item 2, questioned fibres in Item 3 are different in all examined characteristics from fibres in Item 2.
48EM3D	White rayon fibers recovered from Item 3 exhibit the same microscopic characteristics and optical properties as the fibers comprising Item 1. Accordingly, these fibers are consistent with originating from the same source as Item 1 or another source comprised of fibers that exhibit the same microscopic characteristics and optical properties. These fibers are microscopically dissimilar to the fibers comprising Item 2. Accordingly, these fibers are not consistent with originating from the same source as Item 2. Textile fibers recovered from Item 4 are microscopically dissimilar to the fibers comprising Items 1 and 2. Accordingly, these fibers are not consistent with originating from the same sources as Items 1 and 2. These fibers have been preserved for future comparison purposes. The specimens were examined visually using stereomicroscopy, comparison microscopy, polarized light microscopy, and fluorescence microscopy and instrumentally using microspectrophotometry and Fourier transform-infrared spectroscopy.
4LB238	The results show that: Item 3 and item 1 ,could have been originated from the same source (victim's coat). Item 3 didn't not match item 2. item 4 didn't match with item 1 or 2. Item 3 and Item 1 are non delustrant rayon. Item 2 non delustrant polyester. Item 4 delustran polyester .
67ZKRY	Items 1, 2, 3 and 4 were examined visually and by stereomicroscopy and analyzed by polarized light microscopy and infrared spectroscopy. Items 1 and 3 cannot be discriminated from one another by their microscopic properties and chemical composition and could have originated from the same source or another source having the same characteristics. Items 1 and 4 are dissimilar in microscopic properties and chemical composition, indicating that they did not originate from the same source. Items 2 and 3 are dissimilar in microscopic properties and chemical composition, indicating that they did not originate from the same source. Items 2 and 4 are dissimilar in microscopic properties, indicating that they did not originate from the same source.
68BLDX	The trace fibres from the knive (item 3) could have originated from the victims coat (item 1).
6BAZ2M	The questioned fibers in Item 3 corresponded in microscopic characteristics (PLM), color (grey), type (rayon), fluorescence, and chemical composition (FTIR) to the known fibers in Item 1. Therefore, Items 1 and 3 could have a common source (Type III Association). It should be noted that the analytical techniques used allow for a high degree of discrimination between different fibers, however, other textiles containing fibers made to the same specifications (type, color, microscopic characteristics, etc) would be indistinguishable from these fibers. The questioned fibers in Item 3 were different in fiber type (rayon) to the known fibers from Item 2 (polyester). Therefore, Item 2 can be eliminated as being the source of the Item 3 fibers (Elimination). The questioned fibers in Item 4 were different in fiber type (polyester) to the known fibers from Item 1 and different in microscopic characteristics to the known fibers from Item 2. Therefore, Items 1 and 2 can be eliminated as being the source of the Item 4 fibers (Elimination). KEY for instrument acronyms: FTIR – Fourier Transform Infrared Spectroscopy, PLM – Polarized Light Microscopy
6RE8FP	The fibers in Item 3 exhibited no significant differences in optical characteristics, physical characteristics, fluorescence and chemical composition from Item 1, therefore the fibers in Item 3 could have originated from the same source as the fibers in Item 1 or another similar source of gray/silver Rayon fibers. The fibers in Item 4 exhibited some differences in physical and optical characteristics, despite having the same chemical composition as Item 2, therefore the fibers in Item 4 could not have originated from the same source as the fibers in Item 2.

TABLE 4

WebCode	Conclusions
7BPJLK	Item 1 - The known fibers were compared to the collected fibers in item 3. Item 1 can not be eliminated as a possible source of the fibers in item 3. Items 2 - the known fibers were compared to the collected fibers in item 4. Item 2 and item 4 are not similar. Item 2 is not a source of the fibers in item 4.
7JJPEL	The Questioned fibers recovered from the suspect's knife (01-03-AA) are similar in visual color, optical properties, fiber type, and dye composition to the known fibers from the victim's coat (01-01-AA) It is my opinion these fibers could have originated from the victim's coat or any other garment with similar fiber characteristics(Category 2B). The Questioned fibers from the victim's watch (01-04-AA) are different in optical properties to the known fibers from the victim's coat (01-01-AA) and the victim's suit (01-02-AA). It is my opinion these fibers did not originate from the victim's suit or coat (Category 5). The Questioned fibers recovered from the suspect's knife (01-03-AA) are different in optical properties to the known fibers from the victim's suit (01-02-AA) It is my opinion these fibers did not originate from the victim's suit (Category 5).
7RUJFL	Item 1 comprised grey, plain woven fabric. Fibres from the warp and weft yarns both comprised crimped, bright fibres with no perceptible colour. These fibres were identified as Rayon. Item 2 comprised grey, plain woven fabric. Fibres from the warp and weft yarns both comprised crimped, bright fibres with no perceptible colour. The fibres from the warp and weft yarns were identified as Polyester types. Item 3 comprised both tight and loose crimped, bright fibres with no perceptible colour. The fibres were identified as Rayon. The fibres corresponded with fibres from item 1 in terms of crimp, dimensions, composition, fluorescence properties, birefringence and appearance. Item 4 comprised delustered polyester fibres. These fibres differed from the constituent fibres of item 1 and item 2.
82V4GT	Item 1 was a piece of fabric from the known section of the victim's coat. The fabric was made up of grey rayon fibres. Item 2 was a piece of fabric from the known section of the victim's suit. The fabric was made up of grey polyester fibres. The questioned fibers in item 3, which found on the suspect's knife, comprised grey rayon fibres. These questioned grey rayon fibres were found to agree in colour, fibre type and microscopic appearance under various lighting conditions with the control grey rayon fibres from item 1, indicating that the respective fibres could have originated from the same source. The questioned fibers in item 4, which found on the victim's watch, comprised grey polyester fibres. These questioned grey polyester fibres were found to agree in colour and fibre type, but differ in microscopic appearance under various lighting conditions with the control grey polyester fibres from item 2, indicating that the respective fibres did not originate from the same source.
8EJXJU	Questioned fibers found on the suspect's knife (Item 3) could have come from the victim's coat (Item 1). Questioned fibers found on the victim's watch (Item 4) could not have come neither from the victim's coat(Item 1)nor the victim's suit (Item 2).
8R7HBV	Items 1, 2, 3, and 4 were examined using stereomicroscopy, polarized light microscopy, and infra-red spectroscopy. Items 1 and 3 were additionally examined using comparison light microscopy, fluorescence microscopy, and microspectrophotometry. Light gray rayon fibers found in Item 3 were indistinguishable from light gray rayon fibers found in Item 1 in color, general fiber type, and microscopic characteristics (Type 3 Association)* and were different from light gray polyester fibers found in Item 2 (Elimination)**. Light gray polyester fibers found in Item 4 were different from light gray rayon fibers found in Item 1 (Elimination)*** and light gray polyester fibers found in Item 2 (Elimination) ****. *This means that the questioned fibers found on the suspect's knife could have originated from the victim's coat. **This means that the questioned fibers found on the suspect's knife did not originate from the victim's suit. ***This means that the questioned fibers found on the victim's watch did not originate from the victim's coat. ****This means that the questioned fibers found on the victim's watch did not originate from the victim's suit. Trace Interpretation Scale: Type 1 Association: Physical Match—The compared items exhibit physical features that demonstrate they were once part of the same object. Type 2 Association: Association with Distinctive characteristics—Items are consistent in all measured and observed physical properties, chemical composition and/or microscopic characteristics, and therefore could have originated from the same source. The items further share distinctive characteristics that would not be typically encountered in the relevant population. Type 3 Association: Association with

TABLE 4

WebCode	Conclusions
	Conventional characteristics—Items are consistent in all measured and observed physical properties, chemical composition and/or microscopic characteristics, and therefore could have originated from the same source. Because other items have been manufactured or are naturally occurring that would also be indistinguishable from the submitted evidence, an individual source cannot be determined. Type 4 Association: Association with limited characteristics and/or examination (1) Items are consistent in all measured and observed physical properties, chemical composition and/or microscopic characteristics, and therefore could have originated from the same source. This type of evidence may be commonly encountered in the environment or may have limited comparative value. Or (2) The comparison between items may be categorized as a Type 4 Association if the association is limited by the inability to perform a complete analysis or if minor variations are observed in the examination results. Inconclusive —No conclusion could be reached regarding an association or an elimination between the items. Elimination—Items exhibit differences in one or more of the following: physical properties, chemical composition, or microscopic characteristics and therefore did not originate from the same source. Non-Association—The items were different in physical properties, chemical composition, and/or microscopic characteristics, indicating that the items did not originate from the same source. However, these differences were insufficient for a definitive elimination.
8VUGJ7	1.The sample received as the "Known section of the victim´s coat" (Item 1)is made by gray rayon fibers. 2. The sample received as the "Known section of the victim´s suit" (Item 2)is made by gray polyester fibers. 3. The sample received as the "Questioned fibers found on the suspect´s knife" (Item 3)is made by gray rayon fibers. 4. The sample received as the "Questioned fibers found on the victim´s watch" (Item 4)is made by gray polyester fibers. 5. According with the physical properties evaluated, the questioned fibers received as item 3 are indistinguishable from the sample received as item 1.
937XMZ	The light colored fibers recovered from the suspect's knife (Item #3) are similar in color, diameter, optical and chemical properties to the known fibers from the victim's coat (Item #1). The fibers from the victim's coat (Item #1) or another material with similar fiber characteristics could have been the source of the fibers from the suspect's knife (Item #3). The light colored fibers recovered from the suspect's knife (Item #3) are dissimilar in optical and chemical properties to the known fibers from the victim's suit (Item #2). The fibers from the victim's suit (Item #2) were excluded as being a possible source to the fibers from the suspect's knife (Item #3). The light colored fibers recovered from the victim's watch (Item #4) are dissimilar in optical and chemical properties to the known fibers from the victim's coat (Item #1). The fibers from the victim's coat (Item #1) were excluded as being a possible source to the fibers from the victim's watch (Item #4). The light colored fibers recovered from the victim's watch (Item #4) are similar in chemical properties to the known fibers from the victim's suit (Item #2), however they are dissimilar in optical properties. Therefore, the fibers from the victim's suit (Item #2) were excluded as being a possible source to the fibers from the victim's watch (Item #4).
9LXYH4	Combining results from FTIR and SEM techniques, we conclude that item 3 (Suspect's Knife) cannot be excluded as having originated from Item 1 (Victim's Coat), as the fibres have the same composition and morphology. However, item 4 (Victim's Watch) can be excluded as having originated from item 1 as the fibres differ in both composition and morphology (size). Both Item 3 and Item 4 can be excluded as having originated from Item 2 (Victim's Suit). The fibres from Item 3 have a completely different chemical composition from those of Item 2. The fibres from Item 4 match the chemical composition of the fibres from Item 2 but differ in the morphology (size).
A33RP3	In My Opinion - Item 3 could have originated from item 1, could not have originated from Item 2. In My Opinion - Item 4 could not have originated from Item 1 or Item 2.
A67M7K	The known fibers from Items 1 and 2 and the questioned fibers from Items 3 and 4 were examined by stereomicroscopy, polarized light microscopy, fluorescence microscopy and infrared spectroscopy. The questioned round fibers from Item 3 are identified as rayon and are similar in all areas tested to the round rayon fibers from the known section of the victim's coat, Item 1 and could have originated from that source (Level 3 Association). The questioned polyester fibers found on the victim's watch, Item 4 are not similar in type or optical properties as the known rayon fibers from the section of the victim's coat,

TABLE 4

WebCode	Conclusions
	Item 1 (Elimination). The questioned polyester fibers from Item 4 were similar in type but not similar in optical properties (delustrant and fluorescence) to the known polyester fibers from the section of the victim's suit, Item 2 (Elimination).
AC7FLM	Comparative examinations of the colorless rayon yarns/fibers that compose Exhibit 1 (known section of the victim's coat) with the microscopically colorless rayon yarns/fibers recovered from Exhibit 3 (questioned fibers from the suspect's knife) a disclosed them to be consistent in their microscopic characteristics, optical properties and chemical properties. As a result of these findings, the rayon yarns/fibers recovered from Exhibit 3 could have originated from the same source as the rayon fibers in Exhibit 1, or another source with the same characteristics. Techniques utilized in these examinations include stereomicroscopy, polarized light microscopy, transmitted light and fluorescence comparison microscopy, and Fourier transform infrared microspectroscopy. A fiber association is not a means of positive identification and the number of possible sources for a specific fiber is unknown. Due to the variability in manufacturing, dyeing, and consumer use, one would not expect to encounter a suitable fiber selected at random to be consistent with a particular source. Comparative examinations of the colorless polyester yarns/fibers that composed Exhibit 2 (suit) with yarns/fibers recovered from Exhibit 3 (knife) and Exhibit 4 (watch) disclosed them to be inconsistent in their fiber type and the presence of delusterant, respectively. As a result of these findings, the yarns/fibers from Exhibits 3 and 4 could not have originated from Exhibit 2. Comparative examinations of the known colorless rayon yarns/fibers from Exhibit 1 (coat) with the colorless, delustered polyester yarns/fibers recovered from Exhibit 4 (watch) disclosed them to be inconsistent in their fiber type. As a result of these findings, the yarns/fibers from Exhibits 4 could not have originated from Exhibit 1.
ACPQEM	The questioned fibers from the suspect's knife and victim's watch (Items 3 and 4, respectively) were compared to the known gray fabric pieces from the victim's coat and victim's suit (Items 1 and 2, respectively). The known gray fabric from both the coat and suit were constructed of silver-gray woven material. The tested fibers from Items 1 and 3 were similar in all tests performed (polarized light microscopy, fluorescence microscopy, and cross section). In addition, infrared spectroscopy showed both questioned and known fibers to be similar in chemical composition (rayon). The victim's coat, Item 1, is a possible source of the questioned fibers collected from the suspect's knife, Item 3 (Level 3 Association - see association scale below [Table 5 - Additional Comments]). Because other items have been manufactured that would also be indistinguishable from the submitted evidence, an individual source cannot be determined. The questioned fibers collected from the suspect's knife (Item 3) differed in microscopical properties from the known fibers in the fabric sample from the victim's suit (Item 2). The victim's suit as represented by Item 2 is eliminated as a possible source of the questioned fibers in Item 3 (Elimination). The questioned fibers collected from the victim's watch (Item 4) differed in microscopical properties from the known fibers in the fabric samples from the victim's coat and suit (Items 1 and 2, respectively). The clothing articles represented by Items 1 and 2 are eliminated as possible sources of the questioned fibers in Item 4 (Elimination). If additional known clothing items are collected that may have come into contact with the victim's watch, please contact the undersigned as additional comparisons could be conducted.
AQPRTA	The fibers in Item 1 are consistent with the fibers in Item 3. The fibers in Item 2 are unlike the fibers in Item 3 and Item 4.
AZBT9J	The two fiber types in item 3, Rayon and Polyester, exhibited no differences in optical and physical characteristics and chemical composition from the Rayon and Polyester fibers in items 1 and 2, therefore the fibers in item 3 could have originated from the victim's coat and suit. The fibers in item 4, (victim's watch) exhibited significant differences in optical characteristics from the fibers in items 1 and 2, therefore these fibers could not have originated from the victim's coat(item 1)and suit (item 2).
B7W9DG	The fibers from the suspect's knife (Item 3) either originated from the victim's coat (Item 1) or from another fiber source with the same associated physical, optical and chemical properties (Level IV Association). The fibers from the suspect's knife (Item 3) are eliminated as having come from the victim's suit (Item 2). The fibers from the victim's watch (Item 4) are eliminated as having come from the victim's

TABLE 4

WebCode	Conclusions
	coat (Item 1) or the victim's suit (Item 2).
BMM972	The questioned fiber (item 3) have been originated from the victim's coat (item 1), because of their similar physical properties and chemical composition. The questioned fiber (item 4) have been originated from the victim's coat (item 2), because of their similar physical properties and chemical composition.
BTUHTX	based on a reasonable degree of scientific certainty the fibers from the suspects knife share a common origin with the fibers from the victim's coat. The fibers isolated on the suspect's watch does not compare favorably with the fibers from either the victim's coat or suit. Although the fibers isolated from the suspect's watch are polyester, they contain a delustering compound that the polyester fibers from the victim's suit do not.
BVC2DR	The questioned item #3 could have originated from item #1 or from another source exhibiting all of the same analyzed characteristics. Item #1 could not have originated from item #2. Item #4 could not have originated from items #1 or #2.
C6H2RZ	According to the results of microscopic examination, FT-IR, Py/GC and SEM/EDS, the compositions of item_1 is similar to item_3 which is different from item_2 and it's analog item_4.
C9H876	The questioned fibers found on the suspect's knife (Item3) were consistent (indistinguishable) with the known section of victim's coat (Item1) in macroscopic, microscopic, color (MSP), infrared (FTIR) and Raman characteristics. Therefore the questioned fibers found on the suspect's knife (Item3) could have come from the victim's coat (Item1) or another source of fibers with similar macroscopic, microscopic, color (MSP), spectral (FTIR and Raman) characteristics. The questioned fibers found on the suspect's knife (Item3) are dissimilar to the known section of victim's suit (Item2) (distinguishable). Therefore the questioned fibers found on the suspect's knife (Item3) did not originate from the victim's suit (Item2). The questioned fibers found on the victim's watch (Item 4) are dissimilar to the known section of victim's coat (Item1) (distinguishable). Therefore the questioned fibers found on the victim's watch (Item 4) did not originate from the victim's coat (Item1). The questioned fibers found on the victim's watch (Item 4) are dissimilar to the known section of victim's suit (Item2) (distinguishable). Therefore the questioned fibers found on the victim's watch (Item 4) did not originate from the victim's suit (Item2).
C9KA3H	In my opinion, there is a level 3 association between Items 1 and 3. A level 3 association is defined as items being consistent in observed and measured physical properties and/or chemical composition and, therefore, could have originated from the same source. Because other items have been manufactured that would also be indistinguishable from the submitted evidence, an individual source cannot be determined. In my opinion, Items 1 and 2 can be eliminated as being a source for the foreign fibres present in Item 4.
CBL6ED	The fibers from the suspect's knife (Item 3) consisted of colorless to light gray rayon fibers that are similar in size, shape, fiber type, color and microscopic characteristics to the known fibers from the victim's coat (Item 1). It is my opinion that these fibers could have originated from the victim's coat or any other textile with similar characteristics. It should be noted that only a limited color comparison could be performed due to the characteristics of the tested items. The fibers from the suspect's knife are dissimilar in fiber type and microscopic characteristics to the known fibers from the victim's suit (Item 2). It is my opinion that these fibers did not originate from the sampled area of the victim's suit. The questioned fibers found on the victim's watch (Item 4) consisted of colorless polyester fibers that are dissimilar in fiber type and/or microscopic characteristics to known fibers from the victim's coat and suit (Item 1 and 2). It is my opinion that these fibers did not originate from the sampled areas of the victim's coat or suit.
D44WNV	Numerous grey rayon fibers were found in the sample from Item 1.3. These fibers are similar in color, chemical composition, and physical characteristics to the grey rayon fibers composing the standard from Item 1.1. The fibers from Item 1.3 could have come from the same source as the standard from Item 1.1 or any other source composed of similar rayon fibers. Numerous grey polyester fibers were found in the sample from Item 1.4. These polyester fibers have a different chemcial composition than the grey

TABLE 4

WebCode	Conclusions
	rayon fibers composing the standard from Item 1.1. The polyester fibers from Item 1.4 are delustered. Item 1.2 is composed of grey polyester fibers, but the polyester fibers composing Item 1.2 are not delsutered. Consequently, the fibers from Item 1.4 could not have come from the same source as the standard from Item 1.2.
D9CRGN	The Exhibit 1 known fabric was comprised of gray rayon fibers. The fibers in Exhibit 3 were identified as gray rayon fibers and were determined to be consistent in physical characteristics, optical properties and chemical composition to the fibers comprising the Exhibit 1 fabric. The fibers in Exhibit 3 could have originated from Exhibit 1 or any other material consisting of rayon fibers with the same physical characteristics, optical properties and chemical composition. The fibers in Exhibit 4 were identified as gray polyester fibers, and therefore could not have originated from the Exhibit 1 fabric. The gray polyester fibers comprising the Exhibit 2 known fabric were determined to be dissimilar from the fibers in Exhibits 3 and 4. Exhibit 3 differed in fiber type, and Exhibit 4 differed in physical characteristics of the fibers (presence of delustrant). Exhibit 2 was eliminated as the source of the Exhibit 3 and 4 questioned fibers.
DAMU4M	The grey rayon fibers recovered from the knife (Item 3) were determined to be physically (width, color, and crimp spacing), microscopically and chemically (comparison microscopy and Fourier Transform Infrared Spectroscopy) consistent with the grey rayon fibers from the fabric of the coat (Item 1) and therefore may have once had a common origin. The grey fibers recovered from the watch (Item 4) were excluded as having originated from the fabric from Items 1 and 2 based on microscopic differences observed.
DDL9QC	The material from the victim's coat (item 1) consisted of rayon with a pale grey colour. The material from the victim's suit (item 2) consisted of non delustered polyester with a pale grey colour. The fibres found on the suspect's knife (item 3) were found to be composed of rayon with a pale grey colour. In relation to chemical composition, colour, appearance (longitudinal and cross section) the fibers from the knife were found to be indistinguishable from the material from the victim's coat (item 1). Therefore the fibres from these items may share a common origin. The fibres from the victim's watch (item 4) were found to be composed of polyester with a pale grey colour. These fibres were found to be lightly delustered and therefore could not share a common origin with either the material from the victims coat (item 1) or victims suit (item 2).
DYMN63	The grey rayon fibers found in Item 3 exhibit the same microscopic characteristics and optical properties as the grey rayon fibers comprising Item 1; accordingly, the Item 3 grey rayon fibers are consistent with originating from Item 1 or from another source comprised of fibers which exhibit the same microscopic characteristics and optical properties. These fibers are microscopically dissimilar to the fibers comprising Item 2; accordingly, these fibers are not consistent with originating from Item 2. Textile fibers of various types and colors found in Item 4 are microscopically dissimilar to the fibers comprising Items 1 and 2; accordingly, these fibers are not consistent with originating from Items 1 or 2. No other fiber examinations have been conducted on the above-listed items. The above-listed items were examined using stereomicroscopy, comparison microscopy, polarized light microscopy, fluorescence microscopy, microspectrophotometry, and Fourier-Transform Infrared Spectroscopy, as appropriate.
E9RYCR	Exemplar Item 1 is included as a possible source of the unknown fibers in item 3. Exemplar Item 2 is excluded as a possible source of the unknown fibers in item 3. Exemplars Item 1 and Item 2 are excluded as possible sources of the unknown fibers in item 4.
EBJXN6	THE FIBRES FROM ITEMS 1-4 ARE INDISTINGUISHABLE UNDER LPM (40X) MICROSCOPY
ECV7KN	Items 1, 2, 3, and 4 were examined by stereomicroscopy, comparison light microscopy, polarized light microscopy, and infra-red spectroscopy. Items 1 and 3 were additionally examined by fluorescence microscopy. The light gray rayon fibers in Item 3 were indistinguishable from the light gray rayon fibers in Item 1 in color, polymer type, and microscopic characteristics (Type 3 Association).* The light gray rayon fibers in Item 3 were different from the fiber standard in Item 2 (Elimination).** The light gray

TABLE 4

WebCode	Conclusions
	polyester fibers in Item 4 were different from the fiber standards in Items 1 and 2 (Elimination).***. *This means that the light gray fibers found on the suspect's knife could have originated from the victim's coat. **This means that the light gray fibers found on the suspect's knife did not originate from the area sampled from the victim's suit. ***This means that the light gray fibers found on the victim's watch did not originate from the area sampled from the victim's coat and suit. Trace Interpretation Scale: Type 1 Association: Physical Match—The compared items exhibit physical features that demonstrate they were once part of the same object. Type 2 Association: Association with Distinctive characteristics—Items are consistent in all measured and observed physical properties, chemical composition and/or microscopic characteristics, and therefore could have originated from the same source. The items further share distinctive characteristics that would not be typically encountered in the relevant population. Type 3 Association: Association with Conventional characteristics—Items are consistent in all measured and observed physical properties, chemical composition and/or microscopic characteristics, and therefore could have originated from the same source. Because other items have been manufactured or are naturally occurring that would also be indistinguishable from the submitted evidence, an individual source cannot be determined. Type 4 Association: Association with limited characteristics and/or examination (1) Items are consistent in all measured and observed physical properties, chemical composition and/or microscopic characteristics, and therefore could have originated from the same source. This type of evidence may be commonly encountered in the environment or may have limited comparative value. Or (2) The comparison between items may be categorized as a Type 4 Association if the association is limited by the inability to perform a complete analysis or if minor variations are observed in the examination results. Inconclusive—No conclusion could be reached regarding an association or an elimination between the items. Elimination—Items exhibit differences in one or more of the following: physical properties, chemical composition, or microscopic characteristics and therefore did not originate from the same source. Non-Association—The items were different in physical properties, chemical composition, and/or microscopic characteristics, indicating that the items did not originate from the same source. However, these differences were insufficient for a definitive elimination.
EKMAFR	The questioned fibers found on the suspect's knife (item #3) are gray rayon fibers that exhibit the same physical, microscopic, and chemical characteristics as the gray rayon fibers comprising the section of the victim's coat (item #1.) Accordingly, the questioned fibers from the suspect's knife could have originated from the victim's coat. It should be noted that textile fibers do not possess enough individual characteristics to be positively identified as originating from a particular garment to the exclusion of all other garments. The questioned fibers on the victim's watch (item #4) are gray polyester fibers that are microscopically dissimilar to both the gray rayon fibers comprising the section of the victim's coat (item #1) and the gray polyester fibers comprising the section of the victim's suit (item #2.) Accordingly, the questioned fibers on the victim's watch could not have originated from the victim's coat or suit.
FUMZYE	Item 1 consists of woven gray fabric composed of rayon fibers. Item 2 consists of woven gray / silver fabric composed of polyester fibers. Item 3 consists of a tuft of rayon fibers. Item 4 consists of clumps of polyester fibers. The fibers from Item 1 (Known sample from victim's coat) and Item 3 (Questioned fibers from suspect's knife) were found to be similar in macroscopic appearance, microscopic characteristics (PLM), and chemical composition (FTIR). The victim's coat or another item composed of the same fabric could be the source of the fibers found on the suspect's knife. The fibers from Item 1 (K - coat) and Item 4 (Questioned fibers from victim's watch) were found to be dissimilar in microscopic characteristics (PLM) and chemical composition (FTIR). The sampled portion of the victim's coat is not the source of the fibers found on the victim's watch. The fibers from Item 2 (Known sample from victim's suit) and Item 3 (Q - knife) were found to be dissimilar in microscopic characteristics (PLM) and chemical composition (FTIR). The sampled portion of the victim's suit is not the source of the fibers found on the suspect's knife. Although their chemical compositions are similar (FTIR), the fibers from Item 2 (K - suit) and Item 4 (Q - watch) were found to be dissimilar in microscopic characteristics (PLM). The sampled portion of the victim's suit is not the source of the fibers found on the victim's watch.
GMJ8RA	The questioned fibres from the knife (item 3) and from the watch (item 4) were compared to fibres from the victims coat (item 1) and suit (item 2) using comparison microscopy, fluorescence and chemically using Fourier transform infrared spectroscopy. The fibres from items 1, 2 and 3 were also

TABLE 4

WebCode	Conclusions
	cross-sectioned. The fibres recovered from the knife were indistinguishable to the fibres from the victim's coat using these techniques. Therefore, the fibres from the knife could have come from the victim's coat or from another source of this type of fibre. The fibres from the watch had a different microscopic appearance and different fluorescent properties to the fibres from the coat and the suit. Therefore in my opinion the fibres from the watch have not come from either the victim's coat or suit.
GRVKLN	Item-1 and Item-3 are composed of rayon fibers and shared all the class characters observed, therefore Item-3 cannot be excluded from sharing a common provenance with Item-1. Item-2 and Item-4 are composed of polyester fibers and shared all the class characters observed, therefore Item-4 cannot be excluded from sharing a common provenance with Item-2.
GZQXUG	The questioned fibers from Item 3 are similar in color, diameter, delusterant, refractive indices, and chemical composition to the known fibers found in Item 1. These fibers could have shared a common source. The questioned fibers from Item 3 are different in microscopic properties to the known fibers found in Item 2. The questioned fibers from Item 4 are different in microscopic properties to the known fibers found in Item 1 and Item 2.
H8JT6K	The fibers in Item 3 and the fibers from the fabric is Item 1 were found to be alike in all measured characteristics. Therefore, the fibers in Item 3 may have originated from the same source as the fibers in Item 1. The fibers in Item 4 were found to be dissimilar to the fibers in Items 1 and 2.
HE3VCM	1. Examination of Exhibit 1 (known section of the victim's coat) disclosed the presence of a gray fabric swatch composed of rayon fibers. Examination of Exhibit 2 (known section of the victim's suit) disclosed the presence of a gray fabric swatch composed of polyester fibers. Examination of Exhibit 3 (questioned fibers found on the suspect's knife) disclosed the presence of gray rayon fibers. Examination of Exhibit 4 (questioned fibers found on the victim's watch) disclosed the presence of gray polyester fibers. 2. Comparative examinations of Exhibit 1 with Exhibit 3 disclosed them to be consistent in their microscopic characteristics, optical properties, and chemical properties. As a result of these findings, the fibers in Exhibit 3 could have originated from the fabric swatch in Exhibit 1 or another source with the same characteristics. 3. Comparative examinations of Exhibit 1 with Exhibit 4 disclosed them to be inconsistent in their physical characteristics. As a result of these findings, the fibers in Exhibit 4 could not have originated from the fabric swatch in Exhibit 1. 4. Comparative examinations of Exhibit 2 with Exhibits 3 and 4 disclosed them to be inconsistent in their physical characteristics. As a result of these findings, the fibers in Exhibits 3 and 4 could not have originated from the fabric swatch in Exhibit 2. 5. A fiber association is not a means of positive identification and the number of possible sources for a specific fiber is unknown. Due to the variability in manufacturing, dyeing, and consumer use, one would not expect to encounter a suitable fiber selected at random to be consistent with a particular source. 6. Techniques utilized in this examination include stereo microscopy, polarized light microscopy, comparative fluorescence microscopy, microspectrophotometry, and Fourier transform infrared spectroscopy.
J2WZTL	The known section of the victim's coat (Item 1) is composed of light gray rayon fibers. The known section of the victim's suit (Item 2) is composed of light gray polyester fibers. The light gray questioned fibers found on the suspect's knife (Item 3) were identified as rayon fibers. The light gray rayon fibers found on the suspect's knife (Item 3) are similar in physical appearance, color, diameter, chemistry, refractive index and cross sectional shape in comparison to the known section of the victim's coat (Item 1). The light gray rayon fibers found on the suspect's knife (Item 3) could have come from the same source as Item 1 or any other with similar characteristics. The light gray questioned rayon fibers found on the suspect's knife (Item 3) are different in chemistry in comparison to the polyester fibers of the known section of the victim's suit (Item 2). The light gray fibers found on the suspect's knife (Item 3) could not have originated from the same source as the fibers in Item 2. The light gray questioned fibers found on the victim's watch (Item 4) were identified as polyester fibers. The light gray polyester fibers found on the victim's watch (Item 4) are different in physical appearance and chemistry in comparison to the light gray rayon fibers from the known section of the victim's coat (Item 1). The light gray fibers found on the victim's watch (Item 4) could not have originated from the same source as the fibers in

TABLE 4

WebCode	Conclusions
	Item 1. The light gray polyester fibers found on the victim's watch (Item 4) are different in physical appearance in comparison to the polyester fibers of the known section of the victim's suit (Item 2). The light gray fibers found on the victim's watch (Item 4) could not have originated from the same source as the fibers in Item 2.
JT4EFF	Items 1, 2, 3, and 4 were examined visually and using stereomicroscopy. Items 3 and 4 as well as the fibers composing Items 1 and 2 were examined using comparison microscopy, polarized light microscopy (PLM), Fourier Transform Infrared Spectrophotometry (FTIR), and microsolubility tests. The Item 3 fibers and the fibers composing Item 1 were further examined using fluorescence microscopy, Microspectrophotometry (MSP), and microchemical tests. Item 1 was composed of two types of gray regenerated cellulose fibers which differed primarily in the amount of crimp. Two types of gray regenerated cellulose fibers were present in Item 3 that were consistent in physical, chemical, and optical properties with the respective fibers composing the Item 1 fabric. Based upon the fibers examined, it was concluded that these Item 3 gray regenerated cellulose fibers could have originated from the source represented by Item 1 or another source composed of fibers with the same physical, chemical, and optical properties. Based upon the fibers examined, the Item 3 gray regenerated cellulose fibers could not be associated with the gray polyester fibers composing Item 2 due to differences in physical and optical properties. Based upon the fibers examined, gray polyester fibers present in Item 4 could not be associated with the fibers composing Item 1 or 2 due to differences in delustrant. Supporting examination documentation is maintained in the case file. The above listed methods are those approved for use at the time of analysis. All methods can be found in the Trace Evidence Procedures Manual which can be found at <website redacted>.
JYTRJN	The fibers from item 3 (questioned fibers found on the suspect's knife) have similar fiber content as item 1 (known section of the victim's coat). Both consist of manufactured rayon fibers. The fibers from item 4 (questioned fibers found on the victim's watch) have similar fiber content as item 2 (known section of the victim's suit. Both are composed of manufactured polyester fibers.
K3JLUU	Light gray rayon fibers recovered from Item 3 exhibit the same microscopic characteristics and optical properties as the light gray rayon fibers comprising Item 1. Accordingly, these fibers are consistent with originating from the source of Item 1, or another item comprised of fibers that exhibit the same microscopic characteristics and optical properties. These fibers are microscopically dissimilar to the fibers comprising Item 2. Accordingly, these fibers are not consistent with originating from the source of Item 2. Fibers recovered from Item 4 are microscopically dissimilar to the fibers comprising Items 1 and 2. Accordingly, these fibers are not consistent with originating from the sources of Items 1 and 2.
KEEW6M	Microscopic and instrumental examination and comparison of the representative fibers from Items 1 and 3 revealed clear kinky rayon fibers found to be similar in microscopic and chemical properties. They could have come from the same source or any other source with the same properties. Microscopic and instrumental examination and comparison of the representative fibers from Items 1 and 4 revealed clear kinky rayon fibers and polyester fibers, respectively, found to be dissimilar in microscopic and chemical properties. They could not have come from the same source. Microscopic and instrumental examination and comparison of the representative fibers from Items 2 and 3 revealed clear kinky polyester fibers and rayon fibers, respectively, found to be dissimilar in microscopic and chemical properties. They could not have come from the same source. Microscopic and instrumental examination and comparison of the representative fibers from Items 2 and 4 revealed clear kinky polyester fibers and clear delustered kinky polyester fibers, respectively, found to be dissimilar in microscopic properties. They could not have come from the same source.
KJ9VEC	Exhibit 9 (CTS Item 1) consists of one piece of gray woven fabric approximately 50 by 50 mm in size composed of bright, textured, rayon (regenerated cellulose) fibers. Exhibit 10 (CTS Item 2) consists of one piece of gray woven fabric approximately 50 by 50 mm in size composed of bright, textured, polyester fibers. Exhibit 11 (CTS Item 3) consists of several gray threads composed of bright, textured, rayon fibers. The rayon fibers from Exhibit 11 have similar chemical properties and similar microscopically observed morphology, optical properties, fluorescence, and color characteristics as the

TABLE 4

WebCode	Conclusions
	known fibers composing Exhibit 9. The fibers from Exhibit 11 either originated from the source of the known fibers in Exhibit 9 or from another fiber source with similar properties. The rayon fibers from Exhibit 11 could not have originated from the source of the known fibers in Exhibit 10 due to differences in chemical composition and microscopically observed morphology and optical properties. Exhibit 12 (CTS Item 4) consists of several gray threads composed of dull, textured, polyester fibers. The polyester fibers from Exhibit 12 could not have originated from the source of the known fibers in Exhibit 9 due to differences in chemical composition and microscopically observed morphology and optical properties. The polyester fibers from Exhibit 12 could not have originated from the source of the known fibers in Exhibit 10 due to differences in microscopically observed morphology and delusterant levels. The fibers from Exhibits 9 through 12 were analyzed using stereomicroscopy, polarized light microscopy, and Fourier transform infrared micro-spectroscopy. In addition, the fibers from Exhibits 9 and 11 were analyzed using fluorescence microscopy and comparison microscopy.
KQ9DUN	Colorless rayon fibers were found on Item 3 knife. These fibers exhibit the same microscopic characteristics, optical properties, and chemical composition as the fibers comprising the Item 1 known sample. Accordingly, the Item 3 fibers could have come from the same source as the fibers from Item #1, or another source that shares similar microscopic characteristics, optical properties and chemical composition.
KYMA4G	The following test methods were used in reaching the conclusions reported below: visual, microscopical and physical examinations, polarized light microscopy (PLM) and Fourier transform infrared spectroscopy (FTIR). The fabric in Exhibit 1 consisted of rayon fibers. The fabric in Exhibit 2 consisted of polyester fibers. Exhibit 3 consisted of rayon fibers. Therefore, Exhibit 3 could not have originated from Exhibit 2. Exhibit 3 had the same physical characteristics as Exhibit 1; however, no association could be made without further analysis. Exhibit 4 consisted of polyester fibers. Therefore, Exhibit 4 could not have originated from Exhibit 1. Exhibit 4 did not have the same physical characteristics as Exhibit 2 and, therefore, could not have originated from Exhibit 2. These conclusions conform with the relevant Department of Justice policy on Uniform Language for Testimony and Reports available at www.justice.gov.
L726EP	The known fabric from Item 1 consisted of rayon. The known fabric from Item 2 consisted of two types of polyester. The questioned fibers from Item 3 consisted of rayon and were consistent in diameter, color, morphology and chemical composition with the known fabric from Item 1 and could have originated from this source (Level 3 association). The questioned fibers from Item 3 were inconsistent in chemical composition with the known fabric from Item 2 and did not originate from this source (Elimination). The questioned fibers from Item 4 consisted of polyester and were inconsistent in morphology and/or chemical composition with the known fabric from Items 1 and 2 and did not originate from either source (Elimination). Terminology Key for Associative Evidence: The following descriptions are meant to provide context to the levels of opinions reached in this report. Every level of conclusion may not be applicable in every case nor for every material type. Level I Association: A physical match; items physically fit back to one another, indicating that the items were once from the same source. Level II Association: An association in which items are consistent in observed and measured physical properties and/or chemical composition and share atypical characteristic(s) that would not be expected to be readily available in the population of this evidence type. Level III Association: An association in which items are consistent in observed and measured physical properties and/or chemical composition and, therefore, could have originated from the same source. Because other items have been manufactured that would also be indistinguishable from the submitted evidence, an individual source cannot be determined. Level IV Association: An association in which items are consistent in observed and measured physical properties and/or chemical composition and, therefore, could have originated from the same source. As compared to a Level III association, items categorized within a Level IV share characteristics that are more common amongst these kinds of manufactured products. Alternatively, an association between items would be categorized as a Level IV if a limited analysis was performed due to characteristics or size of the specimen(s). Level V Association: An association in which items are consistent in some, but not all, physical properties and/or chemical composition. Some minor variation(s) exists between the known and questioned items and could be due

TABLE 4

WebCode	Conclusions
	to factors such as sample heterogeneity, contamination of the sample(s), or having a sample of insufficient size to adequately assess homogeneity of the entity from which it was derived. Inconclusive: No conclusion could be reached regarding an association/elimination between the items. Elimination: The items were dissimilar in physical properties and/or chemical composition, indicating that they did not originate from the same source.
LDYADD	The results strongly support that the questioned fibers from the suspect´s knife (Item 3) originate from the victim´s coat (Item 1) (Level +3). The results extremely strongly support that the questioned fibers from the victim´s watch (Item 4) do not originate from the victim´s coat (Item 1) (Level -4). The results extremely strongly support that the questioned fibers from the suspect's knife (Item 3) and from the victim ´s watch (Item 4) do not originate from the victim´s suit (Item 2) (Level -4).
LLFBN3	The submitted items consisting of Item 1-Item 4 were examined and analyzed by stereo microscope and comparison polarized light microscope(PLM). The fibers found in item 1 composed of rayon fibers. The fibers found in item 2 composed of nylon fibers. The fibers found in item 3 consisted of rayon fibers which exhibit the same microscopic appearance and characteristics as item 1 but different as item 2. Therefore, these fibers could have originated from the victim's coat and can be excluded as having originated from the victim's suit. The fibers found in item 4 consisted of polyester fibers which exhibit different microscopic appearance and characteristics as item 1 and item 2. Therefore, these fibers can be excluded as having originated from the victim's coat and suit.
LVJNKW	Item 3 could have originated from Item 1. Although both Item 2 & Item 4 are polyesters, but looking closely by microscopical examinations it seems that they are different. hence Item 4 could not have originated from Item 2.
LYEEQ9	The questioned sample item 3 could have originated from item 1 as represented by the known submitted exemplar or from another source exhibiting all of the same analyzed/measured characteristics. Based on comparisons to the submitted exemplars, item 4 could not have originated from the coat represented by item 1. Based on comparisons to the submitted exemplars, items 3 and 4 could not have originated from the suit represented by item 2.
N84E44	The sample of fabric from the victim's coat (Item 1) consisted of woven light grey rayon fibres. The sample of fabric from the victim's suit (Item 2) consisted of woven light grey polyester fibres. The fibres recovered from the suspect's knife (Item 3) consisted of strands of light grey rayon fibres. The fibres recovered from the victim's watch (Item 4) consisted of strands of light grey polyester fibres. No significant differences in appearance and colour were detected between the rayon fibres from the suspect's knife (Item 3) and the rayon fibres from victim's coat (Item 1). It is my opinion that this result indicates that the fibres from the suspect's knife (Item 3) could have originated from the victim's coat (Item 1). Significant differences in appearance were detected between the polyester fibres from the victim's watch (Item 4) and the polyester fibres from the victim's suit (Item 2) and the rayon fibres from the victim's coat (Item 1). It is my opinion that this results indicates that the fibres from the victim's watch (Item 4) did not originate from the victim's suit (Item 2) or the victim's coat (Item 1).
NJW73A	The questioned Rayon fibers in Item 3 are consistent with the known rayon fibers in Item 1 on the basis of microscopic appearance and fiber type. Therefore, the questioned rayon fibers in Item 3 could have originated from the known rayon fibers in item 1. The questioned polyester fibers in Item 4 are not consistent with the known polyester fibers in item 2 on the basis of microscopic appearance. Therefore, the questioned polyester fibers in item 4 could not have originated from the known polyester fibers in item 2. It is pointed out that textile fibers do not possess enough individual microscopic characteristics to be positively identified as originating from a particular garment to the exclusion of all other similar garments.
NQYFA3	Item 1: One grey swatch of grey fabric composed of rayon fibers analyzed as a standard for items 3 and 4. Item 2: One grey swatch of grey fabric composed of polyester fibers analyzed as a standard for items 3 and 4. Item 3: Multiple strands of colorless rayon fibers were found. In the sample analyzed, the unknown colorless rayon fibers "found on the suspect's knife" either originated from the fiber standard

TABLE 4

WebCode	Conclusions
	from "the victim's coat" (item 1) or another source of fibers possessing the same distinct physical, chemical, and optical characteristics. The unknown colorless rayon fibers "found on the suspect's knife" and the fiber standard from "the victim's suit" (item 2) are not the same in physical, chemical, or optical characteristics. The unknown rayon fibers could not have originated from the standard (item 2). Item 4: Multiple strands and loose colorless polyester fibers were found. In the sample analyzed, the unknown colorless polyester fibers "found on the victim's watch" and the fiber standard from "the victim's coat" (item 1) are not the same in physical, chemical, or optical characteristics. The unknown colorless polyester fibers "found on the victim's watch" and the fiber standard from "the victim's suit" (item 2) are not the same in physical or optical characteristics. The unknown rayon fibers could not have originated from either standard (items 1 and 2).
PPL37R	Faint grey rayon fibers recovered from Item 3 exhibit the same microscopic characteristics and optical properties as the fibers comprising Item 1. Accordingly, these fibers are consistent with originating from Item 1, or another item comprised of fibers that exhibit the same microscopic characteristics and optical properties. Light grey textile fibers were recovered from Item 4. No other apparent transfer of textile fibers was detected between Items 1 and 2 and Items 3 and 4. The specimens were examined visually using stereomicroscopy, comparison microscopy, polarized light microscopy, fluorescence microscopy, and instrumentally using microspectrophotometry and Fourier transform-infrared spectroscopy, where appropriate.
PUFZVH	Item 3 fibers could have originated from victim's coat. Item 4 fibers might not have originated from victim's suit.
QPG9Y6	The victim’s coat (item 1) is made of a colourless rayon fibres. His suit is made of colourless polyester fibres. The traces recovered from the suspects’s knife (item 3) match the colourless rayon fibres used in the construction of the victim’s coat (item 1). This match forms an indication that the coat is the source of the fibres recovered from the knife. The victim’s suit (item 2) is excluded as possible source for these traces. The fibres recovered from the victim’s watch (item 4) do not match the fibres used in the construction of either the victim’s coat (item 1) or his suit (item 2). Both items 1 and 2 are excluded as the possible sources for the traces recovered from the watch or the knife.
QR6HAR	The light grey round rayon fibers recovered from Item 3 (Your Item 3) have the same microscopic characteristics and optical properties as the light grey round rayon fibers that comprise the warp and weft of the Item 1 fabric (Your Item 1). Accordingly, the light grey round polyester fibers are consistent with originating from Item 1 or another item comprised of fibers that exhibit the same microscopic characteristics and optical properties. The fibers recovered from Item 4 (Your Item 4) are microscopically dissimilar from the fibers comprising Items 1 and 2 (Your Items 1 and 2). Accordingly, these fibers are not consistent with having originated from Items 1 or 2. The specimens were examined visually using stereomicroscopy, comparison microscopy, fluorescence microscopy, polarized light microscopy, microspectrophotometry, and infrared spectroscopy, where appropriate.
QXRAJ7	Item 1 is composed of light gray rayon fibers that when woven together form a light gray fabric. One fiber from the fabric was examined for the purpose of characterizing the clothing fabric; the exemplar fiber was then compared to eight light gray rayon fibers from item 3 and eight light gray polyester fibers from item 4. The exemplar fiber, 1-A, has similar microscopic, optical, cross-sectional characteristics and a similar infrared spectral pattern to Fibers 3-1 through 3-8. Therefore, Fibers 3-1 through 3-8 could have come from item 1 or any other textile with the same characteristics. The exemplar fiber, 1-A, is dissimilar in microscopic characteristics to the fibers from item 4; therefore, the fibers from item 4 could not have originated from item 1. Item 2 is composed of light gray polyester fibers that when woven together form a light gray fabric. One fiber from item 2 was examined and compared to eight light gray rayon fibers from item 3 and eight light gray polyester fibers from item 4. The exemplar fiber, 2-A, is dissimilar in microscopic characteristics to the fibers from items 3 and 4; therefore, the fibers from items 3 and 4 could not have originated from item 2.
R72QD4	1. Examination of Exhibit 001 (the known fibers that compose the section of the victim’s coat) disclosed the presence of rayon fibers. Examination of Exhibit 002 (the known fibers that compose the section of

TABLE 4

WebCode	Conclusions
	the victim's suit) disclosed the presence of polyester fibers. Examination of Exhibit 003 (the fibers that compose the threads recovered from the suspect's knife) disclosed the presence of rayon fibers. Examination of Exhibit 004 (the fibers that compose the threads recovered from the victim's watch) disclosed the presence of polyester fibers. 2. Comparative examinations of Exhibit 001 with Exhibit 003 disclosed them to be consistent in their microscopic characteristics, optical properties, and chemical properties. As a result of these findings, Exhibit 003 could have originated from Exhibit 001, or another source with the same characteristics. Comparative examinations of Exhibit 001 with Exhibit 004 disclosed them to be inconsistent in their microscopic characteristics, optical properties, and chemical properties. As a result of these findings, Exhibit 004 could not have originated from Exhibit 001. 3. Comparative examinations of Exhibit 002 with Exhibits 003 and 004 disclosed them to be inconsistent in their microscopic characteristics, optical properties, and chemical properties. As a result of these findings, Exhibits 003 or 004 could not have originated from Exhibit 002. 4. A fiber association is not a means of positive identification and the number of possible sources for a specific fiber is unknown. Due to the variability in manufacturing, dyeing, and consumer use, one would not expect to encounter a suitable fiber selected at random to be consistent with a particular source. 5. Techniques utilized in this examination include stereo microscopy, polarized light microscopy, comparative microscopy, fluorescence microscopy, microspectrophotometry, and Fourier transform infrared spectroscopy.
RPWNRD	Item 1 is composed by a single type of grey fiber. It's a manufactured fiber, without delustrant, round cross section, dichroism under polarizad light and light fluorescence. It's identified by FTIR as regenerated cellulose: lyocell. Item 2 is composed by a single type of grey fiber. It's a manufactured fiber without delustrante, trilobal cross section and without dichroism under polarized light, but with fluorescence. It's identified as polyester (PET) by FTIR. Item 3 contains the same type of fiber than item 1. Item 4 is composed by a single type of grey fiber. It's a manufactured fiber with delustrante, round cross section and without dichroism under polarized light, but with fluorescence. It's identified as polyester (PET) by FTIR.
RU4AJG	The gray rayon fibers labeled "questioned fibers found on the suspect's knife", item 3, are consistent in color, physical characteristics, and chemical composition as compared to the gray rayon fibers labeled "known section of the victim's coat", item 1. Level III association. The gray rayon fibers labeled "questioned fibers found on the suspect's knife", item 3, display differences in color, physical characteristics, and chemical composition as compared to the gray polyester fibers labeled "known section of the victim's suit", item 2. Elimination. The gray polyester fibers labeled "questioned fibers found on the victim's watch", item 4, display differences in color, physical characteristics, and chemical composition as compared to the gray rayon fibers labeled "known section of the victim's coat", item 1. Elimination. The gray polyester fibers labeled "questioned fibers found on the victim's watch", item 4, display differences in color and physical characteristics as compared to the gray polyester fibers labeled "known section of the victim's suit", item 2. Elimination.
RXQWC4	The analyzed fibers from item 3 could have originated from item 1 as represented by the known submitted exemplar, or from another source exhibiting all of the same analyzed/measured characteristics. The analyzed fibers from item 3 could not have originated from the source represented by item 2. The analyzed fibers from item 4 could not have originated from the sources represented by item 1 and item 2. Because fibers are mass produced, it is not possible to state that a fiber originated from a particular textile source to the exclusion of all other materials composed of fibers which exhibit the same chemical and optical properties.
T9G6AW	Items 1, 2, 3, and 4 were examined visually and using stereomicroscopy. Fibers composing Items 1 and 2 were examined using stereomicroscopy. Items 3, 4, and fibers composing Items 1 and 2 were examined using comparison microscopy, polarized light microscopy (PLM), Fourier Transform Infrared Spectrophotometry (FTIR), microchemical tests, and microsolubility tests. Item 3 and fibers composing Item 1 were further examined using fluorescence microscopy and Microspectrophotometry (MSP). Colorless regenerated cellulose fibers in Item 3 were consistent in physical, chemical, and optical properties with the fibers composing the Item 1 known section of the victim's coat. Based upon the fibers examined, it was concluded that these Item 3 colorless regenerated cellulose fibers could have

TABLE 4

WebCode	Conclusions
	originated from the Item 1 known section of the victim's coat or another source composed of fibers with the same physical, chemical, and optical properties. Based upon the fibers examined, the Item 3 fibers could not be associated with the polyester fibers composing Item 2 due to differences in color. Based upon the fibers examined, the Item 4 polyester fibers could not be associated with the fibers composing Items 1 or 2 due to differences in delustrant.
TJ47Q7	The fibre samples of the victim´s coat (item 1) and the questioned fibres found on the suspect´s knife (item 3) are composed of regenerated cellulose (Rayon) and match in all examined criteria. Therefore it is likely that the questioned fibres found on the suspect´s knife come from a textile similar to the coat that the victim has worn during the incident. The fibre samples of the victim´s suit (item 2) and the questioned fibres found on the victim´s watch (item 4) are composed of polyester but they do not match in all examined criteria. There is no evidence that the questioned fibres found on the victim´s watch come from the victim´s clothing.
TL9RHD	Item 3, questioned fibers found on the suspect's knife, could have originated from Item 1, known section of victim's coat. Item 3 could not have originated from Item 2, known section of the victim's suit. Item 4, questioned fibers found on the victims's watch, could not have originated from either Item 1 or Item 2.
TTNFCE	On analysis, I found: i. The questioned fiber Item 3 to be rayon, similar to the known fiber Item 1. ii. The questioned fiber Item 4 to be polyester, similar to the known fiber Item 2. Therefore, I am of the opinion that: i. The questioned fiber Item 3 could have originated from the victim's coat (Item 1). ii. The questioned fiber Item 4 could have originated from the victim's suit (Item 2).
TUKQCN	Light grey rayon fibers found in Item 3 exhibit the same microscopic characteristics and optical properties as the fibers comprising Item 1. Accordingly, these fibers are consistent with originating from the same source as Item 1, or another source comprised of fibers which exhibit the same microscopic characteristics and optical properties. The light grey rayon fibers found in Item 3 are microscopically dissimilar to the fibers comprising Item 2. Accordingly, these fibers are not consistent with originating from the same source as Item 2. Light grey manufactured fibers found in Item 4 are microscopically dissimilar to the fibers comprising Items 1 and 2. Accordingly, these fibers are not consistent with originating from the same source as Items 1 and 2. The specimens were examined visually using stereomicroscopy, comparison microscopy, polarized light microscopy, fluorescence microscopy, and instrumentally using microspectrophotometry, and Fourier transform-infrared spectroscopy, where appropriate.
TWPJ2F	1) Questioned fibers found on the suspect's knife (Item3) : are not differentiated from known section of the victim's coat (Item1). Fibers from Item 3 can come from the victim's coat (Item1) or from another textile material with the same characteristics. are different from fibers of the victim's suit (Item 2). 2) Questioned fibers found on the victim's watch (Item 4) are different from fibers of the victim's coat (Item 1) and from fibers of the victim's suit (Item 2).
UGUUV4	Item 3, the questioned fibers found on the suspect's knife, was examined and revealed approximately 100 light gray fibers. The fibers were macroscopically and microscopically examined and compared with the fibers comprising Item 1, the known section of the victim's coat. These comparisons revealed that Item 3, the questioned fibers found on the suspect's knife, was consistent in appearance, fiber type and microscopic characteristics to the fibers comprising Item 1, the known section of the victim's coat, and therefore could have originated from that source. Item 3, the questioned fibers found on the suspect's knife, was also compared with the fibers comprising Item 2, the known section of the victim's suit. These comparisons revealed that Item 3, the questioned fibers found on the suspect's knife, was different in fiber type and microscopic characteristics from the fibers comprising Item 2, the known section of the victim's suit, and therefore could not have originated from that source. Item 4, the questioned fibers found on the victim's watch, was examined and revealed approximately 150 light gray fibers. The fibers were macroscopically and microscopically examined and compared with the fibers comprising Item 1, the known section of the victim's coat. These comparisons revealed that Item 4, the questioned fibers found on the victim's watch, was different in fiber type and microscopic characteristics from the fibers comprising Item 1, the known section of the victim's coat, and therefore could not have

TABLE 4

WebCode	Conclusions
	originated from that source. Item 4, the questioned fibers found on the victim's watch, was also compared with the fibers comprising Item 2, the known section of the victim's suit. These comparisons revealed that Item 4, the questioned fibers found on the victim's watch, was different in microscopic characteristics from the fibers comprising Item 2, the known section of the victim's suit, and therefore could not have originated from that source. Because textile materials are mass produced, it is not possible to state that a fiber originated from a particular source to the exclusion of all other textile materials composed of fibers which exhibit the same physical, optical, and/or chemical properties.
UVBATF	The questioned fibers from the suspect's knife (Item 3) and the questioned fibers from the victim's watch (Item 4) were microscopically examined and compared to Item 1 (the known section of the victim's coat) and Item 2 (the known section of the victim's suit), respectively. The findings were as follows: (i) The comparative examinations on the questioned fibers (Items 3 and 4) with known section of Item 1 revealed that the questioned fibers from the suspect's knife (Item 3) were found to be consistent with Item 1 known sample in microscopic structures, diameter, generic fiber type (Rayon) and chemical composition (FTIR). No similarities observed with Item 4. Based on the above findings, in my professional opinion, the Item 3 questioned fibers could have originated from the victim's coat (Item 1). (ii) The comparative examinations on the questioned fibres (Items 3 and 4) with known section of Item 2 revealed that the questioned fibres from the victim's watch (Item 4) were found to be different with Item 2 known sample in microscopic structures, despite having similarities in diameter, colour (MSP), generic fibre type (Polyester) and chemical composition (FTIR). No similarities observed with Item 3. Based on the above findings, in my professional opinion, the Items 3 and 4 questioned fibers could not have originated from the victim's suit (Item 2).
V7TDDK	Gray rayon fibers recovered from Item 3 exhibit the same microscopic characteristics and optical properties as the fibers comprising Item 1. Accordingly, these fibers are consistent with originating from the same source as Item 1, or another item comprised of fibers that exhibit the same microscopic characteristics and optical properties. These fibers are microscopically dissimilar to fibers comprising Item 2. Accordingly, these fibers are not consistent with originating from the same source as Item 2. Fibers recovered from Item 4 are microscopically dissimilar to fibers comprising Items 1 and 2. Accordingly, these fibers are not consistent with originating from the same sources as Items 1 and 2. No other fibers were recovered from Items 3 and 4. The specimens were examined using the following techniques as appropriate: stereomicroscopy, comparison microscopy, polarized light microscopy, fluorescence microscopy, microspectrophotometry, and Fourier transform-infrared spectroscopy.
V9AAN9	1. Examination of Exhibit 1 (known section of the victim's coat) disclosed the presence of microscopically colorless rayon fibers. 2. Examination of Exhibit 2 (known section of the victim's suit) disclosed the presence of microscopically colorless polyester fibers. 3. Examination of Exhibit 3 (questioned fibers found on the suspect's knife) disclosed the presence of microscopically colorless rayon fibers. 4. Examination of Exhibit 4 (questioned fibers found on the victim's watch) disclosed the presence of microscopically colorless polyester fibers. 5. Comparative examinations of Exhibit 3 with Exhibit 1 disclosed them to be consistent in their microscopic characteristics, optical properties, and chemical properties. As a result of these findings, Exhibit 3 could have originated from the victim's coat or another source with the same characteristics. a. A fiber association is not a means of positive identification and the number of possible sources for a specific fiber is unknown. b. Due to the variability in manufacturing, dyeing, and consumer use, one would not expect to encounter a suitable fiber selected at random to be consistent with a particular source. 6. Comparative examinations of Exhibit 4 with Exhibit 2 disclosed them to be inconsistent in their microscopic characteristics. As a results of these findings, Exhibit 4 could not have originated from the victim's suit. 7. Techniques utilized in this examination include stereo microscopy, polarized light microscopy, comparative microscopy, and Fourier transform infrared spectroscopy.
VEH272	The colourless rayon fibers found from suspect's knife (item 3) are consistent with the colourless rayon fibers of victim's coat (item 1). Item 3 could be originated from item 1. The colourless polyester fibers found from victim's watch (item 4) are not consistent with colourless polyester fibers of victim's suit (item 2). Item 4 could not be originated from item 2.

TABLE 4

WebCode	Conclusions
WED4DH	In my opinion the findings provide moderately strong support for the view that the fibres recovered from the knife (Item 3) of the suspect have originated from the coat (Item 1) from the victim. The fibres from the watch of the victim (Item 4) have not, in my opinion, originated from the coat(Item 1)or the jacket(Item 2)of the victim.
WFAJL9	1. The questioned fibres Item 3 could have originated from the victim's coat Item 1. 2. The questioned fibres Item 4 could not have originatd from the victim's coat Item 1. 3. The questiones fibres Items 3 and 4 could not have originated from the victim's suit Item 2.
WTCK83	Item 1 has two fiber wave phénotypes. Item 3 could have originated from Item 1, more precisely from one of the two fiber wave phenotypes.
XCNU2V	Items 1-4 were examined visually, stereoscopically, microscopically and instrumentally using Fourier Transform Infrared Spectrometry (FTIR). The fibers from Item 3 were visually, microscopically and instrumentally consistent with the fibers from the fabric in Item 1. This indicates the fibers recovered from the suspect's knife (Item 3) and the fabric from the victim's coat (Item 1) could share a common origin. Questioned Item 3 could also have originated from additional sources that are indistinguishable in all assessed examinations and analyses. No statistical or numerical probabilities can be applied to the conclusions of this report. The fibers from Item 4 were not consistent with the fibers from the fabrics in Items 1 and 2. This indicates the fibers recovered from the victim's watch (Item 4) and fabric from the victim's coat (Item 1) and the fabric from the victim's suit (Item 2) could NOT share a common origin.
XHTXP9	The questioned fibers from item 3 could have originated from item 1. The questioned fibers from item 4 didn't originate from item 1.
XKF37Y	CONCLUSIONS: Questioned fibers identified as from the suspect's knife (Item 3) originated from the victim's coat (Item 1) or another source of textile material possessing fibers with the same distinct microscopic, optical, and chemical characteristics. Questioned fibers identified as from the victim's watch (Item 4) did not originate from the victim's coat or suit (Items 1 and 2). RESULTS: Questioned fibers identified as from the suspect's knife and victim's watch (Items 3 and 4) were examined to determine whether or not they are consistent with known fabric from the victim's coat or suit (Items 1 and 2). The sample of fabric from the victim's coat (Item 1) is primarily composed of light grey rayon fibers. The sample of fabric from the victim's suit (Item 2) is primarily composed of light grey polyester fibers. Examination and comparison of questioned fibers identified as from the suspect's knife (Item 3) with the known fibers of the victim's coat (Item 1) reveals they are consistent in microscopic, optical, and chemical characteristics. It is therefore concluded the questioned fibers originated from the coat or another source of textile material possessing fibers with the same distinct microscopic, optical, and chemical characteristics. Examination and comparison of questioned fibers identified as from the victim's watch (Item 4) with known fibers of the victim's coat and suit (Items 1 and 2) reveals they are inconsistent in microscopic characteristics. It is therefore concluded the questioned fibers did not originate from the coat or suit. METHODS OF ANALYSIS: Examinations were performed visually, by stereo microscopy, brightfield/polarized light comparison microscopy, fluorescence microscopy, microspectrophotometry, thermal microscopy and Fourier transform infrared microspectroscopy.
XLRGZZ	CONCLUSIONS: The questioned fibers identified as found on the suspect's knife (CTS Item 3) originated from the victim's coat (CTS Item 1) or another source of textile material possessing fibers with the same distinct microscopic, optical, and chemical characteristics. The questioned fibers identified as found on the victim's watch (CTS Item 4) did not originate from the victim's coat (CTS Item 1) or suit (CTS Item 2). RESULTS: CTS Items 3 and 4 were examined for the purpose of determining whether or not there are any fibers present that are consistent with CTS Items 1 and/or 2. CTS Item 1 is primarily composed of pale gray rayon fibers. CTS Item 2 is primarily composed of pale gray polyester fibers. CTS Item 3 is primarily composed of pale gray rayon fibers. CTS Item 4 is primarily composed of pale gray polyester fibers. Examination and comparison of questioned fibers identified as found on suspect's knife (CTS Item 3) reveals that they are consistent in microscopic, optical, and chemical characteristics with the known fibers of the victim's coat (CTS Item 1). It is therefore concluded the questioned fibers

TABLE 4

WebCode	Conclusions
	originated from the coat or another source of textile material possessing fibers with the same distinct microscopic, optical, and chemical characteristics. Examination and comparison of questioned fibers identified as found on the victim's watch (CTS Item 4) with known fibers of the victim's coat (CTS Item 1) and suit (CTS Item 2) reveals they are inconsistent in microscopic and optical characteristics. It is therefore concluded the questioned fibers did not originate from the coat or suit. METHODS OF ANALYSIS: Examinations were performed visually, by stereo microscopy, brightfield/polarized light comparison microscopy, fluorescence microscopy, microspectrophotometry, thermal microscopy and Fourier transform infrared microspectroscopy.
XPUAK6	Item 3 could have originated from the victim's coat (Item 1), as represented by the submitted coat exemplar, or from another fabric source exhibiting all the same analyzed characteristics. Item 4 could not have originated from the victim's coat (Item 1), as represented by the submitted coat exemplar. Items 3 and 4 could not have originated from the victim's suit (Item 2), as represented by the submitted suit exemplar.
YAXM3W	1. Examination of a representative sample of fibers in Exhibit 1 (victim's coat) disclosed the presence of colorless rayon fibers. 2. Examination of a representative sample of fibers in Exhibit 2 (victim's suit) disclosed the presence of colorless polyester fibers. 3. Examination of a representative sample of the fibers in Exhibit 3 (suspect's knife) disclosed the presence of colorless rayon fibers. 4. Examination of a representative sample of the fibers in Exhibit 4 (victim's watch) disclosed the presence of colorless polyester fibers. 5. Comparative examinations of the questioned colorless rayon fibers from Exhibit 3 with the known colorless rayon fibers in Exhibit 1 disclosed them to be consistent in their microscopic characteristics, optical, and chemical properties. As a result of these findings, Exhibit 3 could have originated from Exhibit 1, or another source with the same characteristics. A fiber association is not a means of positive identification and the number of possible sources for a specific fiber is unknown. Due to the variability in manufacturing, dyeing, and consumer use, one would not expect to encounter a suitable fiber selected at random to be consistent with a particular source. 6. Comparative examinations of the questioned colorless polyester fibers from Exhibit 4 with the known colorless polyester fibers in Exhibit 2 disclosed them to be inconsistent in their microscopic characteristics. As a result of these findings, Exhibit 4 could not have originated from the fibers that compose Exhibit 2. 7. Techniques utilized in this examination include stereo microscopy, polarized light microscopy, fluorescence microscopy, and microspectrophotometry.
YRTDW6	1. Examination of Exhibit 1 (known section of the victim’s coat) disclosed the presence of a light grey piece of plain woven fabric composed of rayon fibers. 2. Examination of Exhibit 2 (known section of the victim’s suit) disclosed the presence of a light grey piece of plain woven fabric composed of polyester fibers. 3. Examination of Exhibit 3 (questioned fibers found on the suspect’s knife) disclosed the presence of rayon fibers. Comparative examinations of the rayon fibers in Exhibit 3 to the rayon fibers that compose the fabric in Exhibit 1 disclosed them to be consistent in their microscopic characteristics, optical properties, and chemical properties. As a result of these findings, these questioned rayon fibers could have originated from the same source of fabric in Exhibit 1, or another source with the same characteristics. 4. Examination of Exhibit 4 (questioned fibers from the victim’s watch)disclosed the presence of polyester fibers. Comparative examinations of the polyester fibers in Exhibit 4 to the rayon fibers that compose the fabric in Exhibit 1 and the polyester fibers that compose the fabric in Exhibit 2 disclosed them to be inconsistent in their microscopic characteristics. As a result of these findings, these questioned polyester fibers could not have originated from the rayon or polyester fibers that compose the fabrics in Exhibits 1 or 2. 5. A fiber association is not a means of positive identification and the number of possible sources for a specific fiber is unknown. Due to the variability in manufacturing, dyeing, and consumer use, one would not expect to encounter a suitable fiber selected at random to be consistent with a particular source. 6. Techniques utilized in these examinations include stereomicroscopy, polarized light microscopy, comparative microscopy, fluorescence microscopy, microspectrophotometry, and Fourier transform infrared spectroscopy.
YVB62Z	The victim’s grey suit, (item 2), was made of very pale (visually colourless) polyester fibres. The victim’s grey coat, (item 1), was made of very pale (visually colourless) regenerated cellulose fibres. The fibres

TABLE 4

WebCode	Conclusions
	from the suspect's knife, (item 3), consisted of a clump of regenerated cellulose fibres that matched the fibres of the victim's coat. The fibres from the watch found in the suspect's possession, (item 4), consisted of a clump of polyester fibres. These did not match the fibres of the victim's suit nor the victim's coat. The above matching fibres provide strong support for the view that the fibres found on the suspect's knife came from the victim's coat rather than these fibres came from a different source. The victim's coat and suit were ruled out as sources of the fibres from the watch found in the suspect's possession. Note: I have no information on the location the fibres were found on the knife or on the watch. In general the surface of such items are non-retentive and this would indicate that the fibres found are from a recent contact unless they have become attached or pinched into the item in which case they could persist for a longer time.
ZDB8H6	The tuft of fibres comprising Item 3 were found to be indistinguishable by microscopy and instrumental colour analysis from the pale grey regenerated cellulose fibres comprising the fabric sample Item 1. In evaluating these findings, I have considered the following propositions: Item 3 originates from Item 1. Item 3 does not originate from Item 1. In my opinion, the findings provide strong support for the former proposition rather than the latter. Item 4 was comprised of a tuft of pale grey polyester fibres which were different from the pale grey polyester fibres comprising the fabric sample Item 2. As such, in my opinion, Item 4 could not have originated from Item 1 or Item 2 and therefore, must originate from another source.
ZJX3F3	The fibers of Item-1 and Item-3, have the same characteristics. Thus the fibres found on the suspect's knife (item-3) come from the victim's coat (item1) or from another textile item of indistinguishable fibers. The fibers found on the victim's watch (Item-4) were inconsistent with item-1 and could not have the same source. The fibers found on the victim's watch (Item-4) were inconsistent with item-2 and could not have the same source.
ZK88TQ	Physical, microscopic, and instrumental comparison of the rayon fibers from Item 3 with the rayon fibers from Item 1 revealed them to be consistent with respect to optical properties, color, and fiber type. Therefore, the fibers found on the suspect's knife could have come from the victim's coat or another source consistent with these properties. Physical and microscopic comparison of the fibers from Item 4 with the fibers from Item 1 and Item 2 revealed them to be inconsistent with respect to optical properties. Therefore, the fibers from the victim's watch did not come from the victim's coat or the victim's suit.
ZZ32A4	Item 1 is a known section from the coat and is composed of rayon fibers. The fibers from Item 3 are rayon fibers and are similar in color, microscopic characteristics, refractive index, and chemistry to the rayon fibers from the coat standard, Item 1. The fibers from Item 3 could have come from the same source as Item 1 or from another source consisting of similar rayon fibers. Item 2 is a known section from the suit and is composed of polyester fibers. The fibers from Item 4 are polyester fibers; however, they are not similar in microscopic characteristics to the polyester fibers from the suit standard, Item 2. The fibers from Item 4 could not have originated from the same source as Item 2. The rayon fibers from Item 3 are not similar in microscopic characteristics to the polyester suit standard from Item 2 and could not have originated from the same source as Item 2. The polyester fibers from Item 4 are not similar in microscopic characteristics to the rayon coat standard from Item 1 and could not have originated from the same source as Item 1. Chemical analysis includes: Polarized Light Microscopy, Fourier Transform Infrared Spectroscopy (FTIR), Microspectrophotometry (MSP), and Refractive Index. Samples collected and analyzed during examination and analysis of the items in this case (ex. slides) were returned to and retained with the original item.

Additional Comments

TABLE 5

WebCode	Additional Comments
3EX7RZ	No useful information was obtained from MSP. Type 3 Association: Association with Conventional Characteristics--Items are consistent in all measured and observed physical properties, chemical composition, and/or microscopic characteristics, and therefore could have originated from the same source. Because other items have been manufactured or are naturally occurring that would also be indistinguishable from the submitted evidence, an individual source cannot be determined. Elimination--Items exhibit differences in one or more of the following: physical properties, chemical composition, or microscopic characteristics and therefore did not originate from the same source.
3XR7WX	If yarn comparison is part of the test, please secure the yarns to prevent fraying of the yarns.
8EJXJU	Questioned fibers found on the suspect's knife (Item 3) matched with fibers of victim's coat (Item 1) in the range of all examined features. Although questioned fibers found on the victim's watch (Item 4) belong to the same type of fibers as fibers of the victim's suit (Item 2) they are different in morphological features.
9LXYH4	It would appear that items 1 and 3 contain a hydrated salt in addition to the rayon (cellulose).
AC7FLM	Future tests should include dyed/colored fibers to fully test the methods and processes of textile fiber comparisons.
ACPQEM	Association Scale for Trace Evidence: The following descriptions are meant to provide context to the levels of opinions reached in this report. Every level of conclusion may not be applicable in every case nor for every material type. Level 1 - Identification: A physical match or fracture match; items physically fit back to one another, indicating that the items were once a single object or from the same source. Level 2 - High Degree of Association: Items are consistent in observed and measured physical properties and/or chemical composition and share atypical characteristic(s) that would not be expected to be readily available in the population of this evidence type. Level 3 - Association: Items are consistent in observed and measured physical properties and/or chemical composition and, therefore, could have originated from the same source. Because other items have been manufactured that would also be indistinguishable from the submitted evidence, an individual source cannot be determined. Level 4 - Limited Association: Items are consistent in observed and measured physical properties and/or chemical composition and, therefore, could have originated from the same source. As compared to a Level 3 association, items categorized within a Level 4 share characteristics that are more common amongst these kinds of manufactured products or are commonly encountered in the environment. Alternatively, an association between items would be categorized as a Level 4 if a limited analysis was performed due to characteristics or size of the specimen(s). Level 5 - Inconclusive Association: Items are consistent in some, but not all, physical properties and/or chemical composition. Some minor variation(s) exists between the known and questioned items and could be due to factors such as sample heterogeneity, contamination of the sample(s), or having a sample of insufficient size to adequately assess homogeneity of the entity from which it was derived. Unsuitable for comparison: No conclusion could be reached regarding an association/elimination between the items. Elimination (Non-association): The items were dissimilar in physical properties and/or chemical composition, indicating that they did not originate from the same source. Inconclusive Non-association: The items appear to exhibit some dissimilarities; however, there are significant limiting factors in the samples (such as lacking in quantity, quality and/or detail) that do not permit an elimination.
B7W9DG	The laboratory's microspectrophotometer was not operational at the time of this proficiency test to use in comparing the fiber samples.
C9KA3H	Levels of Association range from Level 1 (highest) to Level 5 (lowest) and include Inconclusive and Elimination. Item 2 was excluded as being a source of Item 4 due to differences in fibre morphology and delustrant present on Item 4. There were some slight differences in the cross section appearance of

TABLE 5

WebCode	Additional Comments
	Item 1 and Item 3, however this slight difference was not supported through the comparison microscopy examination. As such, I was not prepared to say Items 1 and 3 were different based on this alone.
EBJXN6	WE WOULD ONLY SCREEN FIBRES IN FORCE UNDER THE LOW POWER MICROSCOPE. ANY WHICH ARE INDISTINUISHABLE WOULD BE SUBMITTED TO AN EXTERNAL FORENSIC SERVICE PROVIDER FOR ADDITIOANL TESTING
J2WZTL	Chemical Analysis performed includes: Fourier Transform Infrared Spectroscopy, Comparison Polarized Light Microscopy, Refractive Index and Microspectrophotometry. Samples collected and analyzed during the examination and analysis of the items in this case (ex. glass slides, and cross sections) have been returned to and retained with the original item.
KYMA4G	The exclusions were determined through fiber identification analysis. I was unable to conclude if Exhibit 3 could have originated from Exhibit 1 through fiber identification analysis and my Authorization to Work does n0t include common source comparison.
LYEEQ9	Because textile materials are mass produced, it is not possible to state that a fiber originated from a particular textile source to the exclusion of all other textile materials composed of fibers which exhibit the same chemical and optical properties.
PUFZVH	Item 2 polyester fibers do not show pigmentation. Item 4 polyester fibers do show pigmentation. Therefore, though both items are polyester fibers. Item 4 fibers might not have originated from Item 2.
UGUUV4	Examinations of Items 1, 2, 3 and 4 were performed macroscopically, by stereomicroscopy, brightfield microscopy, polarized light microscopy, fluorescence microscopy and Fourier transform infrared microspectroscopy.
V7TDDK	The evidence description for Item 4 may not be appropriate since it is not known conclusively that the watch belongs to the victim (was recovered from suspect).
VEH272	The found fibers from victim's watch had a lot of delustrants when the fibers from victim's suit did not have them!
XPUAK6	Because textile fibers are mass produced, it is not possible to state that a fiber originated from a particular textile source to the exclusion of all other textile materials composed of fibers that exhibit the same physical, chemical and optical properties.
YVB62Z	Additional information for comparison of fibres of coat, (item 1): The most usually encountered type of regenerated cellulose fibres are viscose rayon fibres which have a serrated irregular cross section shape. The fibres of the victim's grey coat, (item 1), were round regenerated cellulose fibres and are an unusual fibre type. The fibres, (item 1) were very pale (visually colourless). The colour present in the fibres was analysed using uv-visible microspectrophotometry and the fibres from the knife, (item 3), matched the fibres of the coat. The fibres of the woven fabric of the victim's coat, (item 1), consisted of fibres with distinctive undulations (crimping) along their length from one weave direction of the fabric and fibres with slight undulations along their length from the second weave direction of the fabric. The fibres from the knife, (item 3), contained a mix of fibres, some with undulations and some with slight undulations.
ZDB8H6	Note in casework - if a tuft was recovered, the garment would be examined to see if the garment did shed tufts/was damaged etc. It has been assumed in this trial that the garment did shed tufts e.g. had exposed threads and therefore a transfer of tufts might be expected.

-End of Report-
(Appendix may follow)

Collaborative Testing Services ~ Forensic Testing Program

Test No. 19-539: Fibers Analysis

DATA MUST BE SUBMITTED BY **March 11, 2019, 11:59 p.m.** TO BE INCLUDED IN THE REPORT

Participant Code: U1234A WebCode: RYYG9W

The Accreditation Release section can be accessed by using the "Continue to Final Submission" button above. This information can be entered at any time prior to submitting to CTS.

Scenario:
Police are investigating an assault and robbery of a man who was walking to meet friends for drinks after work. The victim was wearing a suit and a long coat. He was assaulted by a man with a knife and some of his clothes were torn in the attack. The suspect ran off after taking the victim's wallet and watch. The victim's description of his attacker led to an arrest of a suspect just hours after the robbery. The police recovered a knife and a watch matching the victim's description in the suspect's possession. Fibers were collected from both items. Police are requesting you to examine the fibers, report their identification(s), and determine if the fibers found on the suspect's knife and/or on the victim's watch could have come from any of the victim's torn clothing.

CTS will not reproduce Interpretation Scales, Scale of Conclusions or Terminology Keys in the final report, please do not submit with the participant's data sheet.

Items Submitted (Sample Pack FIBR):
Item 1: Known section of the victim's coat
Item 2: Known section of the victim's suit
Item 3: Questioned fibers found on the suspect's knife
Item 4: Questioned fibers found on the victim's watch

1.) Could the questioned fibers (Items 3 and 4) have originated from either the victim's coat (Item 1) or the victim's suit (Item 2)?

Item 1 (Known section of victim's coat)

	Yes	No	Inconclusive
Item 3:	○	○	○
Item 4:	○	○	○

Item 2 (Known section of victim's suit)

	Yes	No	Inconclusive
Item 3:	○	○	○
Item 4:	○	○	○

2.) Fiber Type Determination.

Please enter the fiber type (Manufactured, Animal, or Vegetable) and generic name in the blank provided for each Item. For Manufactured fibers please use the terminology in the appendix provided. (Example: Item 1 Vegetable, Cotton)

Item 1:

Item 2:

Item 3:

Item 4:

3.) Indicate the procedure(s) used to examine the submitted items:

Please check all that apply.

Microscopic Exams:	☐ Stereo	☐ Comparison
	☐ Polarized Light	☐ Fluorescence
☐ Macroscopic Exam	☐ IR/FTIR	☐ Microspectrophotometry
☐ Solubility Tests	☐ Cross-Section	☐ Melting Point

Other (specify):

Please note: *Any additional formatting applied in the free form space below will not transfer to the Summary Report and may cause your information to be illegible. This includes additional spacing and returns that present your responses in lists and tabular formats.*

4.) What would be the wording of the Conclusions in your report?

5.) Additional Comments

Appendix: Manufactured Fibers - Names & Definitions

Federal Trade Commision
Rules and Regulations Under the Textile Fiber Products Identification Act
16 CFR Part 303

§303.7 Generic Names and Definitions for Manufactured Fibers

Pursuant to the provisions of Section 7(c) of the Act, the Commission hereby establishes the generic names for manufactured fibers, together with their respective definitions, set forth in this section, and the generic names for manufactured fibers, together with their respective definitions, set forth in International Organization for Standardization ISO 2076: 1999(E), "Textiles – Man-made fibres – Generic names."

(a) Acrylic
A manufactured fiber in which the fiber-forming substance is any long chain synthetic polymer composed of at least 85% by weight of acrylonitrile units.

(b) Modacrylic
A manufactured fiber in which the fiber-forming substance is any long chain synthetic polymer composed of less than 85% but at least 35% by weight of acrylonitrile units, except fibers qualifying under paragraph (j)(2) of this section and fibers qualifying under paragraph (q) of this section.

(c) Polyester
A manufactured fiber in which the fiber-forming substance is any long chain synthetic polymer composed of at least 85% by weight of an ester of a substituted aromatic carboxylic acid, including but not restricted to substituted terephthalate units, and para substituted hydroxy-benzoate units. (1) Where the fiber is formed by the interaction of two or more chemically distinct polymers (of which none exceeds 85% by weight), and contains ester groups as the dominant functional unit (at least 85% by weight of the total polymer content of the fiber), and which, if stretched at least 100%, durably and rapidly reverts substantially to its unstretched length when the tension is removed, the term elasterell-p may be used as a generic description of the fiber. (2) Where the glycol used to form the ester consists of at least ninety mole percent 1,3-propanediol, the term "triexta" may be used as a generic description of the fiber.

(d) Rayon
A manufactured fiber composed of regenerated cellulose, as well as manufactured fibers composed of regenerated cellulose in which substituents have replaced not more than 15% of the hydrogens of the hydroxyl groups. Where the fiber is composed of cellulose precipitated from an organic solution in which no substitution of the hydroxyl groups takes place and no chemical intermediates are formed, the term lyocell may be used as a generic description of the fiber.

(e) Acetate
A manufactured fiber in which the fiber-forming substance is cellulose acetate. Where not less than 92% of the hydroxyl groups are acetylated, the term triacetate may be used as a generic description of the fiber.

(f) Saran
A manufactured fiber in which the fiber-forming substance is any long chain synthetic polymer composed of at least 80% by weight of vinylidene chloride units.

(g) Azlon
A manufactured fiber in which the fiber-forming substance is composed of any regenerated naturally occurring proteins.

(h) Nytril
A manufactured fiber containing at least 85% of a long chain polymer of vinylidene dinitrile where the vinylidene dinitrile content is no less than every other unit in the polymer chain.

(i) Nylon
A manufactured fiber in which the fiber-forming substance is a long chain synthetic polyamide in which less than 85% of the amide linkages are attached directly to two aromatic rings.

(j) Rubber
A manufactured fiber in which the fiber-forming substance is comprised of natural or synthetic rubber, including the following categories: (1) A manufactured fiber in which the fiber-forming substance is a hydrocarbon such as natural rubber, polyisoprene, polybutadiene, copolymers of dienes and hydrocarbons, or amorphous (noncrystalline) polyolefins. (2) A manufactured fiber in which the fiber-forming substance is a copolymer of acrylonitrile and a diene (such as butadiene) composed of not more than 50% but at least 10% by weight of acrylonitrile units. The term lastrile may be used as a generic description for fibers falling within this category. (3) A manufactured fiber in which the fiber-forming substance is a polychloroprene or a copolymer of chloroprene in which at least 35% by weight of the fiber-forming substance is composed of chloroprene units.

(k) Spandex
A manufactured fiber in which the fiber-forming substance is a long chain synthetic polymer comprised of at least 85% of a segmented polyurethane.

(l) Vinal
A manufactured fiber in which the fiber-forming substance is any long chain synthetic polymer composed of at least 50% by weight of vinyl alcohol units, and in which the total of the vinyl alcohol units and any one or more of the various acetal units is at least 85% by weight of the fiber.

(m) Olefin
A manufactured fiber in which the fiber-forming substance is any long chain synthetic polymer composed of at least 85% by weight of ethylene, propylene, or other olefin units, except amorphous (noncrystalline) polyolefins qualifying under paragraph (j)(1) of this section. Where the fiber-forming substance is a cross-linked synthetic polymer, with low but significant crystallinity, composed of at least 95% by weight of ethylene and at least one other olefin unit, and the fiber is substantially elastic and heat resistant, the term lastol may be used as a generic description of the fiber.

(n) Vinyon
A manufactured fiber in which the fiber-forming substance is any long chain synthetic polymer composed of at least 85% by weight of vinyl chloride units.

(o) Metallic
A manufactured fiber composed of metal, plastic-coated metal, metal-coated plastic, or a core completely covered by metal.

(p) Glass
A manufactured fiber in which the fiber-forming substance is glass.

(q) Anidex
A manufactured fiber in which the fiber-forming substance is any long chain synthetic polymer composed of at least 50% by weight of one or more esters of a monohydric alcohol and acrylic acid.

(r) Novoloid
A manufactured fiber containing at least 85% by weight of a cross-linked novolac.

(s) Aramid
A manufactured fiber in which the fiber-forming substance is a long-chain synthetic polyamide in which at least 85% of the amide linkages are attached directly to two aromatic rings.

(t) Sulfar
A manufactured fiber in which the fiber-forming substance is a long chain synthetic polysulfide in which at least 85% of the sulfide linkages are attached directly to two (2) aromatic rings.

(u) PBI
A manufactured fiber in which the fiber-forming substance is a long chain aromatic polymer having reoccurring imidazole groups as an integral part of the polymer chain.

(v) Elastoester
A manufactured fiber in which the fiber-forming substance is a long-chain synthetic polymer composed of at least 50% by weight of aliphatic polyether and at least 35% by weight of polyester, as defined in 16 CFR 303.7(c).

(w) Melamine

A manufactured fiber in which the fiber-forming substance is a synthetic polymer composed of at least 50% by weight of a cross-linked melamine polymer.

(x) Fluoropolymer

A manufactured fiber containing at least 95% of a long-chain polymer synthesized from aliphatic fluorocarbonmonomers.

(y) PLA

A manufactured fiber in which the fiber-forming substance is composed of at least 85% by weight of lactic acid ester units derived from naturally occurring sugars.

Participant Code: U1234A
WebCode: RYYG9W

RELEASE OF DATA TO ACCREDITATION BODIES

The Accreditation Release is accessed by pressing the "Continue to Final Submission" button online and can be completed at any time prior to submission to CTS.

CTS submits external proficiency test data directly to ASCLD/LAB, ANAB, and/or A2LA. Please select one of the following statements to ensure your data is handled appropriately.

○ This participant's data is intended for submission to ASCLD/LAB, ANAB, and/or A2LA. (Accreditation Release section below must be completed.)
○ This participant's data is **not** intended for submission to ASCLD/LAB, ANAB, and/or A2LA.

Have the laboratory's designated individual complete the following steps
only if your laboratory is accredited in this testing/calibration discipline
by one or more of the following Accreditation Bodies.

Step 1: Provide the applicable Accreditation Certificate Number(s) for your laboratory

ANAB Certificate No.
(Include ASCLD/LAB Certificate here)

A2LA Certificate No.

Step 2: Complete the Laboratory Identifying Information in its entirety

Authorized Contact Person and Title

Laboratory Name

Location (City/State)