



Toolmarks Examination Test No. 18-529 Summary Report

Each sample set contained a wire stripper (Item 1), two cable ties containing questioned toolmarks (Items 2 and 3) and additional cable ties for testing purposes. Participants were requested to determine which, if any, of the questioned toolmarks were made by the submitted tool. Data were returned from 151 participants and are compiled into the following tables:

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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 set contained a wire stripper (Item 1), two cable ties containing questioned toolmarks (Items 2 and 3) and additional cable ties for testing purposes. Participants were requested to determine which, if any, of the questioned toolmarks were made by the submitted tool. The Item 2 and Item 3 cable ties were cut by different tools that were not provided for examination.

ITEM 2 (ELIMINATION MARKS): The Item 2 cable tie (with blue paint) was cut by a pair of Do It® 6" diagonal pliers (not provided) and packaged into a pre-labeled Item 2 envelope and assembled into the sample pack box as described below. The above process was repeated until all elimination toolmarks had been prepared.

ITEM 3 (ELIMINATION MARKS): The Item 3 cable tie (with red paint) was cut by a pair of Ideal® T-Stripper wire strippers (not provided) and packaged into a pre-labeled Item 3 envelope. The above process was repeated until all elimination toolmarks had been prepared.

SAMPLE SET ASSEMBLY: Item 1, Item 2 and Item 3 were packaged into a pre-labeled sample pack box along with additional cable ties for testing purposes. This process was repeated until the required number of sample sets were produced. Once verification was completed, the sample sets were sealed with evidence tape and initialed "CTS".

VERIFICATION: In addition to the sample sets examined and confirmed by predistribution laboratories, 10 randomly selected sample sets were examined by a qualified toolmark examiner who also confirmed the expected results.

Summary Comments

This test was designed to allow participants to assess their proficiency at a toolmark examination involving striated type toolmarks. Each sample set contained a wire stripper (Item 1), two cable ties containing questioned toolmarks (Items 2 and 3) and additional cable ties for testing purposes. Participants were requested to determine which, if any, of the questioned toolmarks were made by the submitted tool. The Item 2 and Item 3 cable ties were cut by different tools that were not provided for examination. (Refer to Manufacturer's Information for preparation details.)

Of the 151 responding participants, 140 (93%) either eliminated or were inconclusive as to the Item 1 wire stripper being responsible for the marks on Items 2 and 3. This total includes one participant that did not return examination results in Table 1 but eliminated Item 1 as the source of the marks on Item 2 and Item 3 within their conclusions. Three participants Identified Item 2 and either eliminated (1) or were inconclusive (2) for Item 3 as having been cut by the Item 1 wire stripper and four participants Identified both Item 2 and Item 3 as having been cut by the Item 1 wire stripper. The four remaining participants either eliminated (3) or were inconclusive (1) for Item 2 and Identified Item 3 as having been cut by the Item 1 wire stripper.

CTS is aware that in regards to an Inconclusive determination, as a matter of policy, many labs will not eliminate without access to the tool or when class characteristics match.

Examination Results

Were the suspect toolmarks on either of the cable ties (Items 2 and 3) produced by the questioned wire stripper (Item 1)?

TABLE 1

WebCode	Item 2	Item 3	WebCode	Item 2	Item 3
2D4B6A	No	Inc	9KETPG	Inc	No
2ERU32	No	Inc	9NYUKG	No	Yes
2F7YVK	No	No	9ULRYJ	Inc	No
2KLLE4	Inc	Inc	A2X7GE	Inc	Inc
2X9QNL	No	Inc	ABQ9Y3	Inc	Inc
39MAJ3	Inc	No	AJKFFM	Inc	Inc
3BBLE2	Inc	Inc	AKXT9D	Inc	Inc
42HTL2	Inc	No	AL4GLH	Inc	Inc
447AVA	Inc	No	AUFRMU	No	No
46FAXV	Inc	Inc	B6T9VR	No	No
4B8C72	Inc	Inc	BDQYF3	No	No
4KCLB7	No	Inc	BE69RN	Inc	Inc
6MTB73	No	Inc	BK6THD	Inc	Inc
6YQWMM	No	Inc	BQYLQK	Inc	Inc
79BQCN	No	No	BTX7FR	Inc	Inc
79Q88G	Inc	Inc	C2C7Q8	Inc	Inc
7AP7HM	Inc	Inc	CE26EN	Inc	Inc
7BZ978	Inc	Inc	CG8Q3N	Inc	Inc
7DHCZL	No	No	CGMMWA	Inc	Inc
7JB9ZH	No	Inc	CGPLNW	No	Inc
7JBFZP	Yes	Yes	CMRQ9F	No	No
7MCG6T	No	No	CTEJQU	Inc	Inc
7Q93WV	Inc	Inc	CY327R	No	No
7R6JXL	Yes	Yes	D27GKN	Inc	Inc
7Y8RDZ	Inc	No	D8VQ9D	Inc	Inc
8692LD	Inc	Inc	DAJ8HL	No	No
8BYBUQ	No	No	DBV4MQ	No	No
8MQ6ZT	No	No	DCPNX4	Inc	Inc
8N22BP	Inc	Inc	DCPR7L	No	No
8WTPZZ	No	Inc	DDK7XK	No	No
9BRQD2	No	No	DKJYU8	Inc	Inc

TABLE 1

WebCode	Item 2	Item 3	WebCode	Item 2	Item 3
DWCLT2	No	No	MK7JPG	Inc	Inc
E7XZDH	No	No	MRU6YN	No	No
EE7EDY	No	Yes	MVAWPG	No	No
EEEVZ	Inc	Inc	NCUUKG	No	No
EF7A6H	Inc	Inc	NMUHGK	Inc	Inc
EGFLGR	Yes	Inc	P3FFYQ	No	No
EJ34RD	No	Inc	PBRJ3J	Yes	Inc
EKWTA9	Inc	Yes	PG2RDL	Inc	Inc
EM3ADH	No	Yes	PHBMB8	Yes	Yes
EP78MQ	Inc	Inc	PQA8H9	Inc	Inc
EXMERA	No	Inc	Q23BY8	No	No
EYU2QM	Inc	Inc	QC9TW6	Inc	Inc
F2F726	Inc	Inc	QL6ZAG	No	Inc
FAA8AG	Inc	No	QULHYW	Inc	Inc
FET3FU	No	Inc	QYUZV4	No	No
FJ2JQ4	Inc	Inc	R6FDAX	Inc	Inc
G2WBC2	Inc	Inc	RDD338	No	No
GCD7DA	Inc	Inc	RLLHXA	Inc	Inc
GCW4KT	Inc	Inc	RNVPZ3	No	No
H9RXEL	Inc	Inc	T2X8NU	No	No
HEK38P	No	No	T79PEA	No	No
HF8JGX	No	No	T9BJFZ	Inc	Inc
HMBKNJ	Inc	Inc	TAU3ND	Inc	Inc
HNQML7	Inc	Inc	TBZWXH	Inc	Inc
J2BL2K	Inc	Inc	TCE3Q2	No	No
JTRKCV	Inc	Inc	TGPCNB	No	Inc
K463KR	No	No	THG9BJ	Inc	Inc
K9L9D9	No	No	TJEE6	No	No
KUJWTF	Inc	Inc	TZY8FG	No	No
L6YA6G	Inc	Inc	UFDWUA	No	No
LEB3YK	Inc	Inc	UK9G6K	Inc	Inc
LPNJBN	No	No	V68AH3	Yes	No
M3PF8V	Inc	Inc	VPDN7W	No	Inc
M84YD7	No	No	W3YCRR	Inc	Inc

TABLE 1

WebCode	Item 2	Item 3	WebCode	Item 2	Item 3
W9NYA7	Inc	Inc			
WCPV9L	Inc	Inc			
WRKEPA	Inc	Inc			
XFJEMP	Inc	Inc			
XH9K72	Inc	Inc			
XX2F7	Inc	Inc			
XP4PTB	No	Inc			
XT8F4W	No	Inc			
XVDZRW	No	Inc			
XVWULE	No	No			
Y3QCKN	No	No			
Y7QHYT	Inc	Inc			
YQWVVM	Inc	Inc			
YV6GGY	No	No			
Z39FUA	Inc	Inc			
Z4XU6R	Inc	Inc			
ZBWKGE	No	No			
ZG6Y7Q	No	Inc			
ZMEZL3	Inc	Inc			
ZVLW6Z	Yes	Yes			

Response Summary			Total Participants: 151	
<i>Were the suspect toolmarks on either of the cable ties (Items 2 and 3) produced by the questioned wire stripper (Item 1)?</i>				
Responses		<u>ITEM 2</u>	<u>ITEM 3</u>	
	Yes	7 (4.6%)	8 (5.3%)	
	No	64 (42.4%)	50 (33.1%)	
	Inc	79 (52.3%)	92 (60.9%)	

Conclusions

TABLE 2

WebCode	Conclusions
2D4B6A	Item 3: High degree of similarity, but for identification (highest degree of similarity) has not sufficient characteristics.
2ERU32	The cable tie, Item 2, was not cut using the wire stripper tool, Item 1. The cable tie, Item 3, could be neither identified nor eliminated as having been cut using the wire stripper tool, Item 1.
2F7YVK	During a comparison, a number of factors must be considered including the presence of class and individual characteristics capable of being produced by the implement. Any differences existing between the test and question mark - for a comparison to be valid these differences must be explainable. The manufacturer of the implement may influence the results of any comparison. Negative - The implement did not produce the toolmark.
2KLE4	The suspect toolmark on the submitted black cable tie (Item 2) could have been made by the submitted wire stripper (Item 1) based on class characteristics; however, no significant agreement was observed to make a more conclusive determination. The suspect toolmark on the submitted green cable tie (Item 3) could have been made by the submitted wire stripper (Item 1) based on class characteristics; however, there are no significant individual similarities to suggest that it was. The suspect toolmarks on Items 2 and 3 could have been made by the same tool; however, there are no significant individual similarities to suggest that they were.
2X9QNL	The tool marks on the cable tie in Item 2 were not produced by the wire strippers in Item 1, based on disagreement in class characteristics. The tool marks on the cable tie in Item 3 bear class characteristics consistent with those produced by the wire strippers in Item 1. However, no significant similarities in individual characteristics were observed.
39MAJ3	1. It could not be determined if Item 2 was or was not cut by the exhibit wire cutters (Item 1). 2. The exhibit wire cutters (Item 1) were eliminated from having cut Item 3.
3BBLE2	The tool marks present on Items 001-02 and 001-03 were microscopically examined in conjunction with one another and with test tool marks from the Item 001-01 tool with inconclusive results. The tool marks present on Items 001-02 and 001-03 bear similar class characteristics as test tool marks created using Item 001-01; however, no individual characteristics were observed to identify the tool marks on Items 001-02 and 001-03 as having been made by the same tool or by the Item 001-01 wire strippers, based on its current condition.
42HTL2	1. The tool marks found on the first recovered cable tie, Item 2, could have been made by the submitted Pro'sKit ® wire stripper; based on class and some individual characteristics; however, insufficient detail precludes a more conclusive determination. 2. The tool marks found on the second recovered cable tie, Item 3, were not made by the submitted Pro'sKit ® wire stripper, based on differences in class characteristics.
447AVA	The marks on the cable tie Pos. 3 where not made by the wire stripper Pos. 1. The marks on the cable tie Pos. 2 could or could not have been made by the wire stripper Pos. 1.
46FAXV	Item 1.1 is a pair of Pro'sKit brand wire strippers. Tests were made using Item 1.1 and cable ties submitted with it. Items 1.2 and 1.3 are two pieces of cable ties. The damage to the ends of Items 1.2 and 1.3 were microscopically compared to each other and to the tests from Item 1.1. The damage to Items 1.2 and 1.3 could neither be identified nor eliminated as having been caused by Item 1.1, or the same tool, due to a lack of corresponding individual characteristics.
4B8C72	Microscopic examination did not allow me to wheter identify nor eliminate both cable ties, items 2 and 3, with the wire stripper, item 1.
4KCLB7	With the wire stripper in question (Item 1) test marks were made in various materials such as in the provided cable ties, in wax materials and in lead alloys. Casts of the mentioned test marks were made and then compared with casts of the marks in question from item 2 and item 3 to investigate similarities and dissimilarities of the tool mark structure. On the active surface of the wire stripper grooves from different shape cutting tools of the production process are visible. Also small damages

TABLE 2

WebCode	Conclusions
	<p>and minor striation marks characterize the active surface of the wire stripper tool. In general the surface structures of the test marks caused by Item 1 (wire stripper) are similar to the surface structures on item 2 and item 3. But microscopic examination revealed that the individual structures of the test marks do not correspond, compared with the surface structures of the cable ties in question. The result for Item 2 is "No" because of the direction of some of the striation marks of Item 2. On the surface of Item 2, some striation marks proceed diagonally to the direction of the marks produced during the cutting process. It cannot be explained by the mark pattern of the active surface of Item 1 (wire stripper). The result for Item 3 is "inconclusive" because of the lack of reproducibility of the test marks. The quality and quantity of the test marks produced for comparison in the above mentioned materials were not sufficient to give a higher rank/level of certainty. Also it is possible that the active surface was changed, for example by adhering materials (built-up of materials).</p>
6MTB73	<p>The Item 2 cable tie was not cut by the Item 1 wire stripper. The Item 3 cable tie could neither be identified nor eliminated as having been cut by the Item 1 wire stripper due to insufficient agreement or disagreement of individual characteristics.</p>
6YQWMM	<p>Item 1 is a Pro's Kit pair of wire strippers that uses a shearing, stripping, and gripping action. Due to a difference in class characteristics, Item 1 was excluded as having created the toolmarks present on the Item 2 cable tie. Due to a difference in class characteristics, the toolmarks on Item 2 and Item 3 were excluded as having been produced by the same tool. Due to a lack of sufficient corresponding microscopic marks of value, no conclusion could be reached as to whether the toolmarks present on the Item 3 cable tie were created by the Item 1 wire strippers.</p>
79BQCN	<p>During comparison a number of factors must be considered including the presence of class and individual characteristics capable of being produced by the implement. Any differences existing between the test and question mark for a comparison to be valid these differences must be explainable. The manufacturers of the implement may influence the results of any comparison. Negative - the implement did not produce the tool marks on Item 2 and Item 3.</p>
79Q88G	<p>3. On 2018-10-23 during the performance of my official duties I received a sealed evidence bag with number PA4002345667 from Case Administration of the Ballistics Section containing the following: 3.1 One (1) Pro's Kit wire stripper, marked by me "346615/18 Item 1". 3.2 One (1) piece of black cable tie, marked by me "346616/18 Item 2". 3.3 One (1) piece of green cable tie, marked by me "346616/18 Item 3". 3.4 Four (4) black cable ties not marked. 3.5 Four (4) green cable ties not marked. 4. The intention and scope of this forensic examination comprise of the following: 4.1 Examination of tools and tool mark related material. 4.2 Microscopic individualization of tool marks 5. I examined the wire stripper mentioned in paragraph 3.1 and made replications for test purposes with the black cable ties mentioned in paragraph 3.4, marked by me as "2a" and "2b" respectively. 6. I examined the wire stripper mentioned in paragraph 3.1 and made replications for test purposes with the green cable ties mentioned in paragraph 3.5, marked by me as "3a" and "3b" respectively. 7. I compared the individual and class characteristic markings on the pieces of cable ties mentioned in paragraphs 3.3, 3.3, 5 and 6, using a comparison microscope and found: 7.1 It cannot be determined if the cable ties mentioned in paragraph 3.2 and 3.3 were cut or were not cut by the same tool. 7.2 It cannot be determined if the black cable tie mentioned in paragraph 3.2 was cut or was not cut bt the wire stripper mentioned in paragraph 3.1. 7.3 It cannot be determined if the green cable tie mentioned in paragraph 3.3 was cut or was not cut bt the wire stripper mentioned in paragraph 3.1.</p>
7AP7HM	<p>1. Exhibit 1 consists of one Pro's Kit model CP-301G pair of wire strippers. Exhibit 1 is an offset blade cutting tool with a working surface of 30.60 mm. 2. Exhibit 1.1, test standards, were created by Exhibit 1 and will be returned with the evidence. 3. Exhibit 2 consists of one piece of black colored polymer cable tie. Exhibit 2 has a length of 21.44 mm, a width of 8.77 mm, and a height of 1.64 mm. 4. Exhibit 3 consists of one piece of green colored polymer cable tie. Exhibit 3 has a length of 64.68 mm, a width of 4.65 mm, and a height of 1.26 mm. 5. Exhibits 2 and 3 were microscopically examined and each have toolmarks consistent with damage from a cutting type tool. 6. The toolmarks on Exhibits 2 and 3 area suitable for comparison. 7. It could not be determined if the toolmarks on Exhibits 2 and 3 were or were not made by the same tool or Exhibit 1 due to an agreement of class characteristics and an absence of individual characteristics.</p>

TABLE 2

WebCode	Conclusions
7BZ978	Results from examining the test cuts from Item1 with Item2 and Item3 are inconclusive.
7DHCZL	Marks on the cable ties Item 2 & 3 were not produced by the wire stripper Item 1.
7JB9ZH	The Item 2 black cable tie was not cut by the Item 1 tool. This elimination is based on differences in class and subclass characteristics. The Item 3 green cable tie could not be identified or eliminated as being cut by the Item 1 tool. This inconclusive result is based on insufficient toolmark width surface area to evaluate class, subclass, and individual characteristics.
7JBFZP	Item 1 can be identified as the source of the questioned marks on Item 3. Item 1 is "most likely" the source of the questioned marks on Item 2.
7MCG6T	The cut ends of Items 2 and 3 were microscopically compared with test specimens produced by the Item 1 tool, revealing dissimilarity of class characteristics and significant individual characteristic differences. It was concluded that the toolmarks present on Items 2 and 3 were not made by the Item 1 tool.
7Q93WV	The results neither support nor refute that the suspect toolmarks on the cable tie Item 2 were produced by the questioned wire stripper (Item 1) (Level 0). The results neither support nor refute that the suspect toolmarks on the cable tie Item 3 were produced by the questioned wire stripper (Item 1) (Level 0)
7R6JXL	The suspect toolmarks on both of the cable ties (Items 2 and 3) were produced by the questioned wire stripper (Item 1)
7Y8RDZ	STANDARD TEST CUTS WERE MADE WITH THE SUBMITTED TOOL AND ZIP TIES. ITEM 2 COULD HAVE BEEN CUT BY ITEM 1 BASED ON CLASS CHARACTERISTICS; HOWEVER, NO SIGNIFICANT AGREEMENT WAS OBSERVED TO MAKE A MORE CONCLUSIVE DTERMINATION. ITEM 3 WAS NOT CUT BY ITEM 1 BASED ON DIFFERENCES IN CLASS CHARACTERISTICS.
8692LD	Tool marks observed on the submitted cut zip ties (Items 2 and 3) are not identified or eliminated (Inconclusive) as having been produced by the submitted wire cutters (Item 1). The individual characteristics present do not display agreement.
8BYBUQ	1. Examinations showed the tool marks on Item 2 and Item 3 were not produced by Item 1. 2. Examinations to determine whether the tool marks on Item 2 and Item 3 were produced by the same unknown tool were inconclusive due to insufficient matching individual characteristics.
8MQ6ZT	The cutting parts of the wire stripper (item 1) are polished and are not showing any trace of usage (no individual characteristics). We compared the 2 cutting parts of the wire stripper (Item 1). They showed only very few differences and therefore couldn't be differentiated. As we are not aware of the production process, we are not able to evaluate the individuality of the tool. But we assume that wire strippers which are produced anywhere close to the questioned wire stripper (item 1), in the same production process, would show the same or very similar toolmarks. Although we produced several toolmarks for comparison, we couldn't reproduce the toolmarks on item 2 and item 3.
8N22BP	Examination of the zip ties in Items 2 and 3 revealed the presence of toolmarks that are consistent with being made by a cutting tool. Test toolmarks produced by using the wire cutters in Item 1 were microscopically examined in conjunction with the zip ties in Items 2 and 3. Based on these examinations it was determined that the toolmarks present on Items 2 and 3 bear similar class characteristics as the wire cutters in Item 1. However, the individual characteristics present on Items 2 and 3 are insufficient for a more conclusive examination.
8WTPZZ	Test toolmarks were created using the wire stripper, Item 1, and microscopically compared to the toolmarks exhibited on the two pieces of zip ties, Items 2 and 3. Based on significant disagreement of class characteristics, the toolmark exhibited on the piece of black-colored zip tie, Item 2, could not have been created using the wire stripper, Item 1. Based on significant disagreement of class characteristics, the toolmark exhibited on the piece of black-colored zip tie, Item 2, and the toolmark exhibited on the piece of green-colored zip tie, Item 3, could not have been created using the same working surfaces. The toolmark exhibited on the piece of green-colored zip tie, Item 3, exhibits similar class characteristics as test toolmarks created using the wire stripper, Item 1. However, due to the lack

TABLE 2

WebCode	Conclusions
	of corresponding individual detail, the toolmark on Item 3 could neither be identified nor eliminated as having been created using the wire stripper, Item 1. The results of these examinations are inconclusive.
9BRQD2	The evidence in items 1, 2, and 3 was analyzed by physical and microscopic examination. The toolmarks present on the two (2) cut pieces of cable tie in items 2 and 3 were determined not to have been made by the wire stripper in item 1. The two (2) cut pieces of cable tie in items 2 and 3 were determined to have similar class characteristics. Further analysis is pending submission of another tool or other tools for additional comparison.
9KETPG	It could not be determined if the marks on Item 2 were or were not produced by the tool marked Item 1 due to insufficient on test produced by Item 1.
9NYUKG	Item 2 was not cut with Item 1. There were differences in the direction of tool marks on the cable tie to eliminate the cutters. Item 3 was cut with Item 1. There sufficient microscopic tool marks in agreement with the cable and the tests from the cutters to identify.
9RY3TX	As a result of the microscopic comparison it is certain, that it can be excluded, that the toolmarks on both cable ties marked as "Item 2" an "Item 3" have been produced by the wire stripper marked as "Item 1".[Participant did not report any results in Table 1: Examination Results].
9ULRYJ	Test tool marks were made with Item 1 and submitted media (cable ties). The tool marks on Item 2 could not be identified or eliminated as having been made by Item 1 due to insufficient corresponding individual characteristics (inconclusive). The tool marks on Item 3 were not made by Item 1 based on different individual characteristics(exclusion). Item TM1, the test tool marks, will be retained in the laboratory or designated secure area of the agencies' facilities for possible future analysis.
A2X7GE	3. On 2018-10-09 during the performance of my official duties I received other sealed evidence bag with number PA4002345651 from Case Administration of the Ballistics Section, containing the following exhibits: 3.1 One (1) Pro'sKit ® CP-301G wire stripper marked Test No. 18-529, marked by me "346616/18 Item 1". 3.2 One (1) black cable tie marked with a blue paint, marked by me "346616/18 Item 2". 3.3 One (1) green cable tie marked with a red paint, marked by me "346616/18 Item 3". 3.4 Four (4) black cable ties not marked by me. 3.5 Four (4) green cable ties not marked by me. 4. The intention and scope of this forensic examination comprise of the following: 4.1 Examination of toolmarks and related toolmark materials. 4.2 Microscopic individualization and toolmarks. 5. I examined the wire stripper mentioned in paragraph 3.1 and made replications as follows: 5.1 I made a replication for test purposes from remaining pieces of the exhibits mentioned in paragraphs 3.4 and 3.5 respectively, with the wire stripper mentioned in paragraph 3.1 marked by me "346616/18 Item 1". 5.2 The tests marked "346616/18" each and "1" to "4" and "10" to "15" individually, were from remaining pieces of the exhibits mentioned in paragraph 3.4. 5.3 The tests marked "346616/18" each and "5" to "9" and "16" to "21" individually, were from remaining pieces of the exhibits mentioned in paragraphs 3.5. 6. I compared the individual and class characteristics markings on the exhibits mentioned in paragraphs 3.2 and 3.3 with the tests mentioned in paragraphs 5.2 and 5.3 and found: 6.1 It cannot be determined if the marks from the cable ties mentioned in paragraphs 3.2 and 3.3 marked "346616/18" each and "Item 2" and "Item 3" respectively, were or were not produced by the same wire stripper mentioned in paragraph 3.1 marked "346616/18 Item 1". 6.2 It cannot be determined if the marks from the cable ties mentioned in paragraph 5.2 marked "346616/18" each and "1" to "4" and "10" to "15" respectively, were or were not produced by the same wire stripper mentioned in paragraph 3.1 marked "346616/18 Item 1". 6.3 It cannot be determined if the marks from the cable ties mentioned in paragraph 5.3 marked "346616/18" each and "5" to "9" and "16" to "21" respectively, were or were not produced by the same wire stripper mentioned in paragraph 3.1 marked "346616/18 Item 1". 6.4 It cannot be determined if the marks from the cable ties mentioned in paragraphs 6.2 and 6.3 respectively, were or were not produced by the same wire stripper mentioned in paragraph 3.1 marked "346616/18 Item 1".
ABQ9Y3	Microscopic comparison of evidence item 2 (blue) evidence item 3 (red) and item 1 (wire stripper) reveals the following: Item 2 (blue) and item 3 (red) cannot be identified or eliminated as having been cut with the same unknown tool or with item 1 (wire stripper) due to a lack of sufficient agreement of

TABLE 2

WebCode	Conclusions
	microscopic markings present. SUFFICIENT AGREEMENT: Sufficient agreement exists between two toolmarks means that the agreement is of a quantity and quality that the likelihood another tool could have made the mark is so remote as to be considered a practical impossibility. Sufficient agreement is related to the significant duplication of random toolmarks as evidence by a pattern or combination of patterns of surface contours.
AJKFFM	Examination of the cable ties in Items 2 and 3 revealed toolmarks consistent with being produced by a cutting tool. Test toolmarks produced by Item 1 were microscopically examined in conjunction with the toolmarks present on Items 2 and 3. Based on these comparative examinations, it was determined that the toolmarks on Items 2 and 3 bear similar class characteristics as test toolmarks from Item 1, but insufficient agreement or disagreement of individual characteristics for a more conclusive determination.
AKXT9D	3. On 2018-10-15 during the performance of my official duties I received a sealed evidence bag with number PA4001435117 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) white cartoon box marked "2018 CTS Forensic Testing Program Test No. 18-529 TOOLMARKS EXAMINATION Sample Pack: T2" containing the following exhibits: 3.1.1 One (1) wire stripper cutter marked by me "346620/18 Item 1". 3.1.2 One (1) black cable tie, with a blue end marked by me "346620/18 Item 2". 3.1.3 One (1) green cable tie, with a red end marked by me "346620/18 item 3". 4. The intention and scope of this forensic examination comprises of the following: 4.1 The examination of tools and tool mark related materials. 4.2 Microscopic individualization of tool marks. 5. I examined the wire stripper cutter mentioned in paragraph 3.1.1 and made replications for tests purposes and marked them "346620/18" each and "1" to "10" and "346620/18" each and "A" to "J" respectively. 6. I compared the individual and class characteristics markings on the cable ties mentioned in paragraphs 3.1.2 and 3.1.3 with the tests replications of the wire stripper cutter mentioned in paragraph 5 and found: 6.1 It cannot be determined if the marks on the cable tie mentioned in paragraph 3.1.2 were produce or were not produced by the tool mentioned in paragraph 3.1.1. 6.2 It cannot be determined if the marks on the cable tie mentioned in paragraph 3.1.3 were produce or were not produced by the tool mentioned in paragraph 3.1.1.
AL4GLH	Item 1 is a pair of wire stripping pliers bearing the trade name and model "Pro's Kit CP-301G." Item 2 is a segment of black cable tie material that bears toolmarks of value on one end that are consistent with a pinching/shearing action. Item 3 is a segment of green cable tie material that bears toolmarks of value on one end that are consistent with a pinching/shearing action. Due to a lack of sufficient corresponding microscopic marks of value, no conclusion could be reached as to whether the toolmarks present on Items 2 and 3 were created by the Item 1 pliers. Furthermore, due to a lack of sufficient corresponding microscopic marks of value, no conclusion could be reached as to whether the toolmarks present on Items 2 and 3 were created by the same tool. Should another suspect tool be recovered, please submit it to the Laboratory with Items 2 and 3.
AUFRMU	I conducted an microscopic comparison examination of casts from test cuts of Item 1 with casts sourced from Items 2 & 3. In my opinion Item 1 did not cut either Items 2 or 3 and is therefore eliminated.
B6T9VR	I compared the marks present on the cut surfaces of the two cable ties (items 2 and 3) to test cuts made using the wire strippers (item 1). No correspondence was found in shape and microscopic detail between the cut surfaces of the two cable ties and the test cuts made using the wire strippers. Therefore, in my opinion, the wire strippers have not cut either of the two cable ties.
BDQYF3	On examination, I found the characteristic marks on the cable ties recovered from scene, Item 2 and Item 3, to be different to the characteristic marks produced by the wire stripper Item 1 on test-cut cable ties. Therefore, I am of the opinion that the cable ties recovered from scene, Item 2 and Item 3, were not cut by the wire stripper Item 1.
BE69RN	Items 2 and 3 could not be identified or eliminated as having been cut by the same tool or the Item 1 tool due to an agreement of class and insufficient agreement of individual markings.
BK6THD	3. On 2018-10-08 during the performance of my official duties I received a sealed evidence bag with number PA4002345668 from Case Administration of the Ballistics Section, containing the following:

TABLE 2

WebCode	Conclusions
	<p>3.1 One (1) sealed Cardboard box with no seal number, containing the following exhibits: 3.1.1 One (1) Pro'sKit model CP-301G wire stripper marked by me "346621/18T" 3.1.2 One (1) black cable tie piece marked by me "346621/18E2". 3.1.3 One (1) green cable tie piece marked by me "346621/18E3". 4. The intention and scope of this forensic examination comprise of the following: 4.1 Examination of Tools and toolmark related materials. 4.1 Microscopic individualization of tool marks. 5. I examined the wire stripper mentioned in paragraph 3.1.1 and made replications for test purposes marked by me 621T1 and 621T2 respectively and repliset castings. 6. I compared the individual and class characteristic markings on the pieces of cable ties mentioned in paragraphs 3.1.2, 3.1.3, tests and repliset castings mentioned in paragraph 5 using a comparison microscope and found: 6.1 It cannot be determined if the marks on the cable ties mentioned in paragraphs 3.1.2 and 3.1.3 were or were not produced by the wire stripper mentioned in paragraph 3.1.1.</p>
BQYLQK	<p>Examination of the tool in Item 1 revealed it to be an opposed blade, cutting-type and/or crimping-type tool. Examination of the cable ties in Items 2 and 3 revealed the presence of toolmarks produced by a cutting action. Test toolmarks from the tool in Item 1 were microscopically examined in conjunction with the toolmarks in Items 2 and 3. Based on these comparative examinations, it was determined that the toolmarks in Items 2 and 3 bear similar class characteristics and some similar individual characteristics as one another and the test cuts made by Item 1; however, these similarities are insufficient for a more conclusive determination.</p>
BTX7FR	<p>I examined the cable ties marked Item 2 and Item 3 using a comparison microscope and found microscopic comparable marks which can possibly be utilized for individualization. I examined the wire stripper marked Item 1 and made replications for test purposes and marked the tests Test 1 to Test 4. I compared the individual and class characteristic markings on the exhibits and tests Item 2, Item 3 and Test 1 to Test 4 using a comparison microscope and found: It cannot be determined if the cut marks on the cable ties Item 2&3 were or were not produced by the wire stripper marked Item 1.</p>
C2C7Q8	<p>It is inconclusive if the two submitted cut piece of zip tie, Items 2 and 3, were made by the submitted wire strippers Item 1, due to similar class characteristics and a lack of repeatable individual characteristics. The submitted wire strippers, Item 1, are operational.</p>
CE26EN	<p>Tool Mark Analysis: Methodology - Comparison Microscopy: Test cuts were made with Item 1, the wire stripper, using submitted standard testing media. Comparisons between the tool marks on Items 2 and 3, the cable ties, to each other and to test cuts made with Item 1, the wire stripper, were inconclusive due to insufficient corresponding class and individual microscopic characteristics.</p>
CG8Q3N	<p>Tool Mark Analysis: Methodology - Comparison Microscope: Test marks were made with Item 1 the wire stripper/cutter, using submitted standard testing media. Comparisons between the tool mark on Items 2 and 3, the cable ties, to each other and to test marks and casts made with Item 1, the wire stripper/cutter, were inconclusive due to insufficient corresponding class and individual microscopic characteristics. Item 1A, the test marks and casts, was sealed in a manila envelope and will be retained in the laboratory for possible future analysis.</p>
CGMMWA	<p>Toolmarks observed on the black and green sections of cable tie (Items 2 and 3, respectively) are not identified or eliminated (inconclusive) as having been produced by the submitted wire stripper (Item 1). The individual characteristics present do not display agreement.</p>
CGPLNW	<p>Item 1 (wire strippers) are double-bladed shearing tools. Item 2 is a piece of cable tie that exhibits damage consistent with that produced by a pinching or shearing tool. Based on class characteristic differences, item 2 can be eliminated as having been damaged by item 1 (wire strippers). Item 3 is a piece of cable tie that exhibits damage consistent with that produced by a shearing tool. It can neither be identified nor eliminated as having been damaged by item 1 (wire strippers). Based on class characteristic differences, item 3 (cable tie) can be eliminated as having been damaged by the same tool that damaged item 2 (cable tie).</p>
CMRQ9F	<p>The marks on the cable ties marked Item 2 and Item 3 were not produced by the wire stripper marked Item 1.</p>
CTEJQU	<p>Microscopic examination and comparison of the toolmarks on the cable ties (items # 2 and 3) were compared with test toolmarks produced by the wire strippers (item # 1) using the supplied test cable</p>

TABLE 2

WebCode	Conclusions
	ties. The results of this microscopic examination and comparison were inconclusive.
CY327R	As a result of the comparison between item 1, item 2 and item 3 with the help of microscope, it was observed that the traces found on item 1 and the traces found on item 2 and item 3 were different in terms of class characteristics. For this reason, it is concluded that the items numbered item 2 and item 3 are not interrupted by item 1.
D27GKN	I examined the cable ties Items 2-3 using a comparison microscope and found microscopic comparable marks which can possibly be utilized for individualization. I examined the wire stripper Item 1 and made replications for test purposes. I compared the individual and class characteristic markings on the cable ties and tests using a comparison microscope and found: It cannot be determined if the cut marks on the cable ties were or were not produced by the wire stripper.
D8VQ9D	Exhibit 1 was macroscopically and microscopically examined and consists of one (1) pair of Pro's Kit brand wire stripper, that employ a shearing tool action and contain toolmarks of value for comparison. Test cuts were obtained from Exhibit 1 and designated 1-T1 through 1-T6. Macroscopic and microscopic examination determined that Exhibits 2 and 3 each have a cut end that is characteristic of a shearing type tool. Test cuts from Exhibit 1 were microscopically compared to Exhibits 2 and 3. Although similar in class characteristics, no further association could be made whether or not Exhibit 1 produced the cuts ends on Exhibits 2 and 3, due to a lack of sufficient individual corresponding toolmarks. Therefore, Exhibit 1 could neither be identified nor eliminated as having cut Exhibits 2 and 3.
DAJ8HL	As a result the toolmarks on item 2 and item 3 are different from the toolmarks which made by item 1
DBV4MQ	The toolmarks on the cable ties (Items 2 and 3) were not produced by the wire stripper (Item 1).
DCPNX4	It could not be determined if the submitted wire stripper, Item 1, cut the submitted cable tie, Item 2, due to insufficient corresponding individual characteristics. It could not be determined if the submitted wire stripper, Item 1, cut the submitted cable tie, Item 3, due to insufficient corresponding individual characteristics.
DCPR7L	The item (2) and item (3) questiond toolmarks were compared to the test toolmarks produced using the item (1) wire stripper. The item (2) and item (3) questiond toolmarks not made using the item (1) wire stripper.
DDK7XK	1. Examinations showed the tool marks on Item 2 were not produced by Item 1. 2. Examinations showed the tool marks on Item 3 were not produced by Item 1. 3. Examinations to determine if the tool marks on Item 2 were produced by the same unknown tool as the tool marks on Item 3 were inconclusive due to insufficient matching individual characteristics.
DKJYU8	3. On 2018-10-17 during the performance of my official duties I received a sealed evidence bag with number PA4002345665 from Case Administration of the Ballistics Section, containing a sealed white box with the following contents: 3.1 One (1) wire stripper with green handgrips marked by me "346601/18 1". 3.2 One (1) piece of black cable tie (marked with blue paint) marked by me "346601/18 2". 3.3 One (1) piece of green cable tie (marked with red paint) marked by me "346601/18 3". 4. The intention and scope of this forensic examination comprise of the following: 4.1 Examination of tools and tool mark related materials. 4.2 Microscopic individualization of tool marks. 5. I examined the wire stripper mentioned in paragraph 3.1 and made replications for test purposes marked by me T1 to T7 respectively. 6. I compared the individual and class characteristic markings on the pieces of cable ties mentioned in paragraphs 3.2 and 3.3 and the tests mentioned in paragraph 5 using a comparison microscope and found: 6.1 It cannot be determined if the marks on the pieces of cable ties mentioned in paragraphs 3.2 and 3.3 were or were not produced by the same tool or the tool mentioned in paragraph 3.1.
DWCLT2	I concluded that the suspect toolmarks on the cable ties, Item 2 and Item 3 were not produced by the questioned wire stripper, Item 1.
E7XZDH	Examinations showed that Item 1 did not cut Item 2. Examinations showed that Item 1 did not cut Item 3.

TABLE 2

WebCode	Conclusions
EE7EDY	[No Conclusions Reported.]
EEEVRZ	Items 2 and 3 were microscopically examined. Items 2 and 3 exhibit similar marks with each other and those produced by the Item 1 wire stripper. Due to the lack of sufficient class and individual characteristics, it was not possible to identify or eliminate these items as having been cut by the same tool or Item 1. Therefore, these comparisons are inconclusive.
EF7A6H	Microscopic examination of Item 2 and Item 3 revealed both cable ties had been cut by a shearing tool. Test toolmarks produced using the wire stripper/cutter in Item 1 were microscopically examined in conjunction with the cut cable ties in Item 2 and Item 3. Based on these comparative microscopic examinations it was determined that the cut cable ties in Item 2 and Item 3 bear the same class characteristics as the toolmarks produced by Item 1. However, no agreement or disagreement of individual characteristics due to a lack of reproducibility precluded a more conclusive examination.
EGFLGR	The item 2 cable tie bears marks that were made by the item 1 wire stripper. The item 3 cable tie bears similar but insufficient microscopic marks to permit a positive identification to the item 1 wire stripper.
EJ34RD	Item 1 is a Pro's Kit pair of wire strippers that uses a shearing, stripping, and gripping action. Due to a difference in class characteristics, Item 1 was excluded as having created the toolmarks present on the Item 2 cable tie. Due to a difference in class characteristics, the toolmarks on Item 2 and Item 3 were excluded as having been produced by the same tool. Due to a lack of sufficient corresponding microscopic marks of value, no conclusion could be reached as to whether the toolmarks present on the Item 3 cable tie were created by the Item 1 wire strippers.
EKWTA9	On 2018-10-11 during the performance of my official duties I received a sealed evidence bag with number PA4002345666 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) white carton box marked "2018 CTS FORENSIC TESTING PROGRAM TEST NO. 18-529 TOOLMARKS EXAMINATION Sample Pack: T2", containing the following exhibits: 3.1.1 One (1) wire stripper cutter marked as "Item 1" and further marked by me as "346617/18 Item 1". 3.1.2 One (1) cable tie, with a blue end, marked as "Item 2" and further marked by me as "346617/18 Item 2". 3.1.3 One (1) cable tie, with a red end, marked as "Item 3" and further marked by me as "346617/18 Item 3". 4. The covering letter with reference #101, not dated, omits to mention the sealed evidence bag number PA4002345666. 5. The intention and scope of this forensic examination comprises of the following: 5.1 The examination of tools and toolmark related materials. 5.2 Microscopic individualization of toolmarks. 6. I examined the wire stripper cutter mentioned in paragraph 3.1.1 and made replications for test purposes and marked them "T1A" to "T9A" and "T1B" to "T9B" respectively. 7. I compared the individual and class characteristic markings on the cable ties mentioned in paragraphs 3.1.2 and 3.1.3 with the test replications of the wire stripper cutter mentioned in paragraph 6, using a comparison microscope and found: 7.1 The marks on the cable tie mentioned in paragraph 3.1.3 were produced by the tool listed in paragraph 3.1.1. 7.2 It cannot be determined if the marks on the cable tie mentioned in paragraph 3.1.2, were or were not produced by the tool mentioned in paragraph 3.1.1. 7.3 It cannot be determined if the marks on the cable ties mentioned in paragraphs 3.1.2 and 3.1.3, were or were not produced by the same tool.
EM3ADH	Tools, like the submitted blades of the wire stripper, have individual surface-features, due to their manufacturing process and use. These surface-features can be transferred onto objects that are worked with the tool, if toolmarks show sufficient details that were caused by the corresponding individual structures of the tool, the tool can be identified to have caused the toolmarks. Due to the individual features in the submitted toolmarks, it is proven that: The toolmarks on Item 2 were not caused by the blades of the wire-stripper Item 1. The toolmarks on Item 3 were caused by the blades of the wire-stripper Item 1.
EP78MQ	Items 2 and 3 have been cut by a tool employing a shearing action, such as a pair of wire strippers. Microscopic examination and comparison of the toolmarks present on Items 2 and 3 were compared to the toolmarks produced on test cuts made using the Item 1 wire stripper. Due to agreement of class characteristics, but insufficient agreement of individual characteristics, it could not be determined whether or not Items 2 and 3 were cut by the Item 1 wire strippers.

TABLE 2

WebCode	Conclusions
EXMERA	The tool marks observed on the zip tie in Item 2 were not produced by the wire cutters in Item 1, based on disagreement observed in class characteristics. The tool marks observed on the zip tie in Item 3 bear class characteristics consistent with those produced by the wire cutters in Item 1. However, no significant similarities in individual characteristics were observed.
EYU2QM	I examined the cable ties Items 2 & 3 using a comparison microscope and found microscopic comparable marks which can possibly be utilized for individualization. I examined the wire stripper Item 1 and made replications for test purposes. I compared the individual and class characteristic markings on the cable ties and tests using a comparison microscope and found: It cannot be determined if the cut marks on the cable ties were or were not produced by the wire stripper.
F2F726	3. On 2018-10-09 during the performance of my official duties I received a sealed evidence bag with number PA4002345664 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) wire stripper cutter marked as "346598/181". 3.2 One (1) black piece of cable tie, with a blue end, marked as "346598/182". 3.3 One (1) green piece of cable tie, with a red end, marked as "346598/183". 4. The intention and scope of this forensic examination comprises of the following: 4.1 The examination of tools and toolmark related materials. 4.2 Microscopic individualization of toolmarks. 5. I examined the wire stripper mentioned in paragraph 3.1 and made replications for test purposes and marked them 598T1 to 598T22 respectively. 6. I compared the individual and class characteristic markings on the cable ties mentioned in paragraphs 3.1.2 and 3.1.3 with the test replications of the wire stripper mentioned in paragraph 6, using a comparison microscope and found: 6.1 It cannot be determined if the marks on the cable tie mentioned in paragraph 3.2, were or were not produced by the tool mentioned in paragraph 3.1. 6.2 It cannot be determined if the marks on the cable tie mentioned in paragraph 3.3, were or were not produced by the tool mentioned in paragraph 3.1.
FAA8AG	Toolmarks on the cable tie Item 3 are not produced by the questioned wire stripper (Item 1). Toolmarks on the cable tie Item 2 could have been made by the questioned wire stripper (Item 1) or another wire stripper, that can create similar marks.
FET3FU	The wire stripper/cutter (Item A-1) was examined. The wire cutter portion was used to make test cuts in plastic cable ties. Item A-2 The toolmarks in the test cuts were microscopically compared to the toolmarks on the plastic cable tie (Item A-2). Microscopic comparison of these cable ties revealed significant differences in class of tool action. The toolmarks made on Item A-2 were not made by Item A-1. Item A-3 The toolmarks in the test cuts were microscopically compared to the toolmarks on the plastic cable tie (Item A-3). Microscopic comparison of these cable ties revealed that they have similar cutting class (tool action), but do not have agreement or disagreement of individual marks. The toolmarks on Item A-3 could not be identified or eliminated as having been made by Item A-1. The findings are inconclusive.
FJ2JQ4	Due to a similarity of class characteristics and a lack of matching marks/pattern areas of individual characteristics, the two submitted zip ties (Items 2 & 3) were unable to be eliminated or identified as having been cut by the same tool, nor as having been cut by the submitted tool (Item 1).
G2WBC2	The Items 01-02 and 01-03 cable ties were unable to be identified or eliminated as having been cut by the same unknown tool or by the Item 01-01 wire stripper due to the lack of reproducible marks.
GCD7DA	1.I examined the cable ties Items 2-3 using a comparison microscope and found microscopic comparable marks which can possibly be utilized for individualization. 2.I examined the wire stripper Item 1 and made replications for test purposes. 3.I compared the individual and class characteristic markings on the cable ties and tests using a comparison microscope and found: It cannot be determined if the cut marks on the cable ties were or were not produced by the wire stripper.
GCW4KT	Tool marks observed on items 2 and 3 (portions of cut cable ties) are not identified or eliminated (inconclusive) as having been produced by item 1 (Pro'sKit wire stripper). The individual characteristics present do not display sufficient agreement.
H9RXEL	A comparative microscopic examination between the exhibit cable ties (Item 2 and 3), revealed they displayed insufficient individual detail to determine if they were cut by the same tool. A further comparative microscopic examination between the exhibit and cable ties (Item 2 and 3) and the test

TABLE 2

WebCode	Conclusions
	cuts (Item 1), revealed that the exhibit cable ties (Item 2 and 3), displayed insufficient individual detail to determine whether they were cut by the exhibit wire stripper (Item 1)
HEK38P	The cable tie segments Item #2 and Item #3 were not cut by the wire stripper Item #1.
HF8JGX	Upon comparison, I found the characteristic toolmarks on Item 2 and Item 3 were not match with the test cut marks by item 1 (wire stripper).
HMBKNJ	Toolmark Analysis: Methodology - Comparison Microscopy: Test marks were made with Item 1, the Pro's Kit wire stripper, using submitted testing media. Item 1A, the test marks, was sealed in a manila envelope and will be returned with the evidence to the submitting agency. Comparisons between the tool mark on Items 2 and 3, the apparent plastic fragments, and test marks made with Item 1, the Pro'sKit wire stripper, were inconclusive due to insufficient individual microscopic characteristics. Comparisons between the tool mark on Items 2 and 3, the apparent plastic fragments, were inconclusive due to insufficient individual microscopic characteristics.
HNQML7	3. On 2018-10-08 during the performance of my official duties I received other sealed evidence bag with number PA4002345650 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) sealed evidence bag with number, containing the following exhibits: 3.1.1 One (1) Pro'sKit ® CP-301G wire scrapper marked Test No. 18-529. 3.1.2 One (1) black cable tie marked by me "346627/18 2" inside an envelope. 3.1.3 One (1) green cable tie marked by me "346627/18 3" inside an envelope. 3.1.4 Four (4) black cable ties marked by me "346627/18" each and "4" to "7" individually. 3.1.5 Four (4) green cable ties marked by me "346627/18" each and "8" to "11" individually. 4. The intention and scope of this forensic examination comprise of the following: 4.1 Examination of toolmarks and related toolmark materials. 4.2 Microscopic individualization and toolmarks. 5. I examined the wire scrapper mentioned in paragraph 3.1.1 and made replications as follows: 5.1 I made a replication for test purposes from remaining piece of the exhibits mentioned in paragraph 3.1.4 with the wire scrapper marked by me "346627/18" each and "Test1" and "Test 2" individually; and "T1" to "T8" respectively. 6. I compared the individual and class characteristics markings on the exhibits mentioned in paragraphs 3.1.2 and 3.1.3 with the tests mentioned in paragraph 5.1 and found: 6.1 It cannot be determined if the marks from the cable ties mentioned in paragraphs 3.1.2 and 3.1.3 were or were not produced by the same tool. 6.2 It cannot be determined if the marks on the exhibits mentioned in paragraphs 3.1.2 and 3.1.3 were or were not produced by the wire scrapper mentioned in paragraph 3.1.1.
J2BL2K	I conducted a comparative microscopic examination between the cut pieces of cable ties (Items 2 and 3) and test cuts I made in similar material using the base of the cutting blades of the wire strippers (Item 1). The results of both comparisons were inconclusive. Item 2 displayed a series of striae which were similar to the striae produced by the wire strippers in the test cut materials. However no correspondence in these striations could be found beyond randomly matching agreement. As the test cut to test cut intercomparison was marginal in the quantity and quality of agreement, I could neither identify or eliminate the wire strippers as having been responsible for cutting Item 2. Item 3 displayed poor quality striae and the class of pattern observed differed somewhat to the class of pattern created by the wire strippers in test cut material. But as the test cut to test cut intercomparison was marginal, I could neither identify or eliminate the wire strippers as having been responsible for cutting Item 2.
JTRKCV	[No Conclusions Reported.]
K463KR	The questioned toolmarks on both of the cable ties labeled as Item 2 and Item 3 were not produced by the questioned wire stripper tool labeled as Item 1.
K9L9D9	The marks on the cable tie marked Item 2 and Item 3 were not produced by the wire stripper marked Item 1.
KUJWTF	Tool Mark Analysis: Test marks were made with Item 1A, the wire stripper, using submitted standard testing media. Methodology - Comparison Microscopy: Comparisons between the tool marks on Items 1B and 1C, the pieces of plastic, to each other and to test marks made with Item 1A, the Pro'sKit wire stripper, were inconclusive due to insufficient corresponding microscopic characteristics.

TABLE 2

WebCode	Conclusions
L6YA6G	The tool mark evidence provides strong support for the proposition that Item 2 and Item 3 were NOT cut by the submitted wire strippers.
LEB3YK	1. Item 1 could have produced the cut on item 2 based on class characteristics; however, insufficient detail precludes a more conclusive determination. 2. Item 1 could have produced the cut on item 3 based on class characteristics; however, insufficient detail precludes a more conclusive determination.
LPNJBN	THE TOOLMARKS PRESENT IN THE CUTTING AREA OFN THE PLASTIC FLANGES(ITEMS 2 AND 3) ARE NOT IDENTIFIED AS PRODUCED BY THE TOOL IDENTIFIED AS ITEM 1
M3PF8V	The Items 01-02 and 01-03 cable ties were unable to be identified or eliminated as having been cut by the Item 01-01 wire stripper/cutter or the same unknown tool as one another due to a lack of reproducible marks.
M84YD7	Item 2 and Item 3 were not produced by Item 1 which is a wire stripper that was recovered from suspect.
MK7JPG	1. The wire stripper item 1 was found to be inconclusive as having been used to cut the cable tie item 2. 2. The wire stripper item 1 was found to be inconclusive as having been used to cut the cable tie item 3.
MRU6YN	The wire stripper (Item 1) was not used to cut Item 2 and/or Item 3.
MVAWPG	It was determined utilizing stereomicroscopic and comparison microscopic examination that the questioned partial toolmark impressions observed on the item 2 and item 3 zip ties were not made by the item 1 tool.
NCUUKG	[No Conclusions Reported.]
NMUH GK	The cut mark on the Laboratory Item 001.B (Item 2) black cable tie recovered from the scene is inconclusive as being made by Laboratory Item 001.A (Item 1) Pro'sKit brand wire stripper recovered from the suspect. The inconclusive finding resulted from agreement of all discernible class characteristics, and some disagreement of individual characteristics, but insufficient for an elimination. The cut mark on the Laboratory Item 001.C (Item 3) green cable tie recovered from the scene is inconclusive as being made by Laboratory Item 001.A (Item 1) Pro'sKit brand wire stripper recovered from the suspect. The inconclusive finding resulted from agreement of all discernible class characteristics, and some disagreement of individual characteristics, but insufficient for an elimination. The cut mark on the Laboratory Item 001.B (Item 2) black cable tie recovered from the crime scene is inconclusive as being made by the same tool as the cut mark on the Laboratory Item 001.C (Item 3) green cable tie recovered from the crime scene. An inconclusive finding resulted from agreement of all discernible class characteristics, without agreement or disagreement of individual characteristics due to absence, insufficiency, or lack of reproducibility.
P3FFYQ	The wire strippers (item 01-01) did not cut the black cable tie (item 01-02) or the green cable tie (item 01-03). These eliminations are based on class characteristic differences.
PBRJ3J	Marks produced with Item 1 match the marks found on Item 2. Therefore, Item 2 was cut with Item 1. Marks produced with Item 1 did not match the observed marks on Item 3. However, due to the material the marks were formed on (texture, softness), a fully convinced decision could not be formulated with absolute certainty. Therefore, the result is inconclusive.
PG2RDL	MICROSCOPIC COMPARISON EXAMINATIONS OF THE FIRST CABLE TIE, Q1 (ITEM 2), THE SECOND CABLE TIE Q2 (ITEM 3) AND THE WIRE STRIPPER, K1 (ITEM 1) HAVE REVEALED THAT THE TOOLMARKS ON Q1 AND Q2 COULD NOT BE IDENTIFIED OR ELIMINATED AS HAVING BEEN MADE WITH THE SAME TOOL AND ALSO THE TOOLMARKS COULD NOT BE IDENTIFIED OR ELIMINATED AS HAVING BEEN MADE WITH THE WIRE STRIPPER K1 DUE TO A LACK OF SUFFICIENT CORRESPONDING MARKINGS. Sufficient agreement is related to the significant duplication of random toolmarks as evidence by a pattern or combination of patterns of surface contours. Sufficient agreement exists between two toolmarks means that the agreement is of a quantity and quality that the likelihood another tool could have made the mark is so remote as to be

TABLE 2

WebCode	Conclusions
	considered a practical impossibility.
PHBMB8	An experimental sample of black cable tie was performed by Item 1 and it matched with Item 2. An experimental sample of green cable tie was performed by Item 1 and it matched with Item 3.
PQA8H9	Test marks made by Item 1 were microscopically compared to the cut ties in Items 2 and 3 and found to have similar class characteristics. Evaluation of the individual characteristics failed to reveal an identification or elimination. Therefore, the wire strippers in Item 1 could not be identified or eliminated as having made the marks on Items 2 and 3.
Q23BY8	The identifiable toolmark on Item 2 in exhibit T2 was examined and found not to have been caused by Item 1 in exhibit T2. This elimination was based on differences of class characteristics. The identifiable toolmark on item 3 in exhibit T2 was examined and found not to have been caused by Item 1 in exhibit T2, in its submitted condition. This elimination was based on differences of individual characteristics.
QC9TW6	Examination of Items 2 and 3 revealed the presence of toolmarks (cuts) that are consistent with having been produced by a cutting tool. Test cuts from the wire stripper in Item 1 were microscopically examined in conjunction with the toolmarks present on Items 2 and 3. Based on these comparative examinations and observed class and individual characteristics, it was determined that Items 2 and 3 bear similar class characteristics and some similar individual characteristics as test cuts from Item 1. However, these similarities are insufficient for a more conclusive determination.
QL6ZAG	Test toolmarks were created using the wire strippers, Item 1, and microscopically compared to the cut portions of zip ties, Items 2 and 3. The cut portion of zip tie, Item 3, exhibits similar class characteristics as those displayed on test toolmarks created from the wire strippers, Item 1. However, due to the lack of corresponding individual detail, the toolmarks exhibited on Item 3 could neither be identified nor eliminated as having been created by the wire strippers, Item 1. The results of these examinations are inconclusive. Based on a significant disagreement of class characteristics, the toolmarks exhibited on the cut portion of zip tie, Item 2, could not have been created by the wire strippers, Item 1. Based on significant disagreement of class characteristics, the toolmarks exhibited on the cut portions of zip ties, Items 2 and 3, could not have been created by the same working surfaces.
QULHYW	3. On 2018-10-08 during the performance of my official duties I received a sealed evidence bag with number PA4002345663 from Case Administration of the Ballistics Section, containing the following exhibits : 3.1 One (1) Pro's Kit CP-301G wire stripper marked by me "346623/18 Item 1". 3.2 One (1) black cable tie marked by me "346623/18 Item 2". 3.3 One (1) green cable tie marked by me "346623/18 Item 3". 4. The intention and scope of this forensic examination comprise of the following: 4.1 Microscopical individualization of toolmarks. 4.2 Examination of tools and toolmark related materials. 5. 5.1 I examined the Wire stripper mentioned in paragraph 3.1 marked "346623/18 Item 1" and made replications for test purposes. 6. I compared the individual and class characteristics markings on the black and green cable ties marked "346623/18 Item 2" and "346623/18 Item 3" respectively mentioned in paragraph 3.2 and 3.3 with the tests mentioned in paragraph 5.1 using a comparison microscope and found: 6.1 It cannot be determined if the marks on the black and green cable ties marked "346623/18 Item 2" and "346623/18 Item 3" respectively were produced by the same tool, or by the tool mentioned in paragraph 3.1 marked "346623/18 Item 1".
QYUZV4	Tools are often used by criminals and can leave behind evidence for the forensic examiner. Two tests of the same kind and made by the same manufacturer may look the same, but through use each tool can acquire differences. It is this difference that make them unique. The examination of toolmarks, as with other physical evidence is based on two characteristics - class characteristics and individual characteristics. Class characteristics are those characteristics that are common to a group of objects. For example wire stripper has a distinctive shape and typical size. Individual characteristics are those characteristics which are unique to a given object. They are a result of wear and tear or may be caused by isolated incidents during manufacture.
R6FDAX	3. On 2018-10-08 during the performance of my official duties I received a sealed evidence bag with number PA4002345652 from Case Administration of the Ballistics Section containing the following:

TABLE 2

WebCode	Conclusions
	<p>3.1 One (1) black wire stripper with green hand grips marked by me "346624/18 1". 3.2 One (1) piece of black cable tie marked by me "346624/18 2". 3.3 One (1) piece of green cable tie marked by me "346624/18 3". 4. The intention and scope of this forensic examination comprise of the following: 4.1 Examination of tools and tool mark related material. 4.2 Microscopic individualization of tool marks 5. I examined the black piece of cable tie and the green piece of cable tie mentioned in paragraph 3.2 and 3.3 using a comparison microscope and found microscopic comparable marks which can possibly be utilized of individualization. 6. I examined the wire stripper mentioned in paragraph 3.1 and made replications for test purposes marked by me 1/1, 2/1, 1/2, 2.2, 1, 2, 3, 4, 5, 6, 7 and 8 respectively. 7. I compared the individual and class characteristic markings on the black piece of cable tie mentioned in paragraph 3.2, the green piece of cable tie mentioned in paragraph 3.3 and the replications of the wire stripper mentioned in paragraph 3.1 using a comparison microscope and found: 7.1 It cannot be determined if the marks on the black piece of cable tie were or were not produced by the tool mentioned in paragraph 3.1. 7.2 It cannot be determined if the marks on the green piece of cable tie and the marks on the black piece of cable tie were produced by the same tool. 7.3 It cannot be determined if the marks on the green piece of cable tie were or were not produced by the tool mentioned in paragraph 3.1.</p>
RDD338	<p>Test marks from Item #1 were compared microscopically to Items # 2 and #3. The results were negative due to difference in striations on the Items, therefore; Items #2 and #3 were not cut by Item #1.</p>
RLLHXA	<p>I examined the cable ties marked Item 2 and Item 3 using a comparison microscope and found microscopic comparable marks which can possibly be utilized for individualization. I examined the wire stripper marked Item 1 and made replications for test purposes. I compared the individual and class characteristic markings on the exhibits and tests mentioned in using a comparison microscope and found: It cannot be determined if the cut marks on the cable ties marked Item 2 and Item 3 were or were not produced by the wire stripper marked Item 1.</p>
RNVPZ3	<p>When a tool is used to commit a crime, marks will sometimes be left to compare. Class and individual characteristics capable of being produced by the tool needs to be compared. Class are those characteristics that are common to a batch of tools (manufacturer). Individual characteristics are unique to a tool (wear & tear). My result: Negative. The tool (Item 1) did not cut Item 2 and Item 3.</p>
T2X8NU	<p>Known test standards created with Item 1 (wire cutter) were microscopically compared to Items 2 and 3 (questioned cut cable ties). It was determined that Items 2 and 3 were not cut with Item 1 due to agreement of class characteristics but differences in individual characteristics.</p>
T79PEA	<p>The wire stripper received as "item 1" has not been the tool used to cut the first and second cable tie, respectively codified as "item 2" and "item 3".</p>
T9BJFZ	<p>It could not be determined if the toolmarks on Exhibits 2 and 3 were or were not made by the Exhibit 1 wire cutter/stripper due to an agreement of class characteristics and an absence of individual characteristics.</p>
TAU3ND	<p>The laboratory examinations of the two cables (item 2 and 3) and wire stripper (item 1) by means of the comparison microscope Leica FS C. The enclosed evidence material (item 2 and 3) as well as the comparative material obtained with the wire stripper (item 1) were examined in order to find individual characteristics present on their surfaces.</p>
TBZWXH	<p>The test standards from the Pro'sKit (Item #1) wire cutter were compared against the two zip ties marked #2 and #3; however, the results of the microscopic comparisons were inconclusive. It was not possible to identify or eliminate the two zip ties marked #2 and #3 as having been cut by the submitted Pro'sKit (Item #1) wire cutter.</p>
TCE3Q2	<p>I used the wire stripper (Item 1) and cut tests with it from the cable ties that was sent with the exhibits. The exhibits (Item 2 and Item 3) were not cut with the wire stripper (Item 1).</p>
TGPCNB	<p>[No Conclusions Reported.]</p>
THG9BJ	<p>Each piece of sample exhibits tool marks along the exposed end. The two cut pieces of cable tie (items</p>

TABLE 2

WebCode	Conclusions
	2 and 3) could not be matched to test cuts made from the submitted wire strippers (item 1). No direct association between the tool marks on 2 and 3 and the cutter (#1) were identified.
TJEE6	Examinations showed that the tool marks on Item 2 were not made by Item 1. Examinations showed that the tool marks on Item 3 were not made by Item 1.
TZY8FG	The evidence in items 1, 2, and 3 was analyzed by physical and microscopic examination. The toolmarks present on the two (2) cable ties in items 2 and 3 were determined not to have been made by the wire stripper in item 1. Further analysis of the toolmarks present on the two (2) cable ties in items 2 and 3 is pending submission of another tool for additional comparison.
UFDWUA	As a result of the comparison between item 1, item 2 and item 3 with the help of microscope, it was observed that the traces found on item 1 and the traces found on item 2 and item 3 were different in terms of characteristics. For this reason, it was determined that it was not cut, by item 1. (The wire stripper)
UK9G6K	The item 1-1 tool was used to make test cuts in the submitted item 1-4 black plastic and in the submitted item 1-5 green plastic. Item 1-2-1 is a length of black plastic with toolmarks observed on one end that are suitable for microscopic comparisons. Item 1-3-1 is a length of green plastic with toolmarks observed on one end that are suitable for microscopic comparisons. Definitive class characteristics of the toolmarks observed on both items 1-2-1 and 1-3-1 could not be determined; therefore, items 1-2-1 and 1-3-1 were microscopically compared to test toolmarks produced by the item 1-1 tool. Neither item 1-2-1 nor item 1-3-1 could be identified or eliminated as having been cut by the item 1-1 tool. This inconclusive conclusion is based on insufficient agreement and insufficient disagreement in the patterns of microscopic markings observed among the compared items.
V68AH3	The item no. 2 was produced by the questioned wire stripper.
VPDN7W	Due to a difference in class characteristics, the toolmark on the Item 2 zip-tie was eliminated as having been produced by the Item 1 wire stripper. Additionally, the toolmark on the Item 2 zip-tie was eliminated as having been produced by the tool that produced the toolmark on Item 3 zip-tie due to a difference in class characteristics. Due to a lack of sufficient corresponding microscopic marks of value, no conclusion could be reached as to whether the toolmark present on the Item 3 zip-tie was produced by the Item 1 wire stripper.
W3YCRR	On the items 2 and 3 there are toolmarks made by cutter type tool. The quality of the cut marks in items 2 and 3 are not good enough for comparison.
W9NYA7	Due to the lack of markings used for identification purposes, it is not possible to determine if items 2 and 3 were produced by item 1.
WCPV9L	01-01 : One Pro'sKit model CP-301G wire stripper (Item 1). This item was submitted for comparisons. 01-02 : One piece of black cable tie (Item 2). The black cable tie was not identified or eliminated as having been cut by the wire stripper (1-01) or by the same tool used to cut the other submitted cable tie (1-03) due to agreement in available class characteristics but a lack of consistent and repeatable individual marks. 01-03 : One piece of green cable tie (Item 3). The green cable tie was not identified or eliminated as having been cut by the wire stripper (1-01) or by the same tool used to cut the other submitted cable tie (1-02) due to agreement in available class characteristics but a lack of consistent and repeatable individual marks. 01-04 : Four piece of black cable tie and four piece of green cable tie (not listed on submission form) These cable ties were submitted as known samples.
WRKEPA	The Items 2 and 3 cable ties and test toolmarks from the Item 1 wire stripper were examined and microscopically compared to each other with the following results: Toolmarks on Items 2 and 3 are inconclusive to each other and to the Item 1 wire stripper due to insufficient agreement/disagreement of individual characteristics. The Items 2 and 3 toolmarks are consistent with having been made by a shearing type tool.
XFJEMP	Items 2 and 3 were inconclusive to Item 1 due to a lack of agreement / disagreement of individual characteristics; however, all observed class characteristics were in agreement.
XH9K72	Item 1 is a Pro'sKit® 6 1/2" long wire stripper, model CP-301G. Item 2 is one (1) cut section of cable

TABLE 2

WebCode	Conclusions
	tie, black in color, exhibiting toolmarks on one end. The opposite end is painted blue. Item 3 is one (1) cut section of cable tie, green in color, exhibiting toolmarks on one end. The opposite end is painted red. Items 2 and 3 could not be identified or eliminated as having been cut by the same tool, or by the Item 1 tool due to insufficient agreement or disagreement of markings.
XXM2F7	The Items 2 and 3 cable ties were compared to tests produced utilizing the Item 1 wire stripper. The results were inconclusive for both questioned items due to the lack of corresponding individual characteristics.
XP4PTB	Test toolmarks were created using the wire strippers, Item 1, and microscopically compared to toolmarks exhibited on the zip ties, Items 2 and 3. Based on significant disagreement of class characteristics, the toolmarks exhibited on the zip tie, Item 2, could not have been created using the wire strippers, Item 1. The toolmarks exhibited on the zip tie, Item 3, exhibit similar class characteristics as those exhibited by toolmarks created by the wire strippers, Item 1. However, due to the lack of corresponding individual detail, Item 3 could neither be identified nor eliminated as having been created by the wire strippers, Item 1. The results of these examinations are inconclusive.
XT8F4W	1. Exhibit 1 is a Pro'sKit brand model CP-301G wire stripper. a. Examination of Exhibit 1 disclosed that it is designed as a bypass shearing tool. b. Exhibit 1 was used with the supplied cable tie test material to create the Exhibit 1.1 test standards, which are being returned along with Exhibit 1. 2. Examination of Exhibit 2 disclosed a cut piece of black cable tie which was microscopically compared to the test standards from Exhibit 1. a. The Exhibit 2 cable tie was not cut by Exhibit 1 due to sufficient disagreement of class characteristics. 3. Examination of Exhibit 3 disclosed a cut piece of green cable tie which was microscopically compared to the test standards from Exhibit 1. a. Microscopic comparison disclosed an agreement of class characteristics, but no significant agreement or disagreement of individual characteristics. It could not be determined if the Exhibit 3 cable tie was or was not cut by Exhibit 1. TECHNICAL NOTE: Class characteristics are defined as measurable features of a firearm/tool which indicate a restricted group source. They result from design features and are determined prior to manufacture of the firearm/tool. Individual characteristics are defined as marks produced by the random imperfections or irregularities of firearm/tool surfaces. These random imperfections or irregularities are produced incidental to manufacture and/or caused by use, corrosion, or damage, and are unique to that specific tool. Any conclusions indicating that a toolmark was made by a specific firearm/tool are not to the absolute exclusion of all other firearms/tools because it is not feasible to examine all firearms/tools in the world. However, observing this amount of agreement from a different source is considered extremely remote.
XVDZRW	1) Exhibit 1 (Pro'skit brand wire strippers) is designed to be used as a bypass blade cutting tool. Exhibit 1.1 (Test Toolmarks) was created for comparison and is being returned with Exhibit 1. 2) Exhibits 2 (Black ziptie) and 3 (Green ziptie) were visually examined and microscopically compared to test toolmarks from Exhibit 1. a) The toolmarks on Exhibit 2 were not made by the Exhibit 1 wire strippers based on a disagreement of class characteristics. b) It could not be determined if the toolmarks on Exhibit 3 were made by Exhibit 1 based on an agreement of class characteristics and an insufficient agreement of individual characteristics.
XVWULE	The cuts in cable ties named Item 2 and Item 3 were not produced by the suspect wire stripper named Item 1.
Y3QCKN	The toolmark on item 2 was not made by the wire strippers, item 1. The toolmark on item 3 was not made by the wire strippers, item 1.
Y7QHHT	1. Examination of Exhibit 1 disclosed it to be an Eclipse Tools CP-301G Pro's Kit Precision Wire Stripper tool, consistent with being used as a wire stripper. Exhibit 1.1. (Test standards) was created for comparison and is being returned with Exhibit 1. 2. Examination of Exhibit 2 disclosed it to be a portion of a black color polymer cable tie displaying damage consistent with having been cut on one end. The individual characteristics of Exhibit 2 was determined to be suitable for microscopic comparison. 3. Examination of Exhibit 3 disclosed it to be a portion of a green color polymer cable tie displaying damage consistent with having been cut on one end. The individual characteristics of Exhibit 3 was determined to be suitable for microscopic comparison. 4. Exhibits 1.1, 2, and 3 were microscopically compared to one another.

TABLE 2

WebCode	Conclusions
YQWVM	Toolmarks observed on items 2 and 3 are not identified or eliminated (Inconclusive) as having been produced by the submitted wire stripper (Item 1). The individual characteristics present do not display agreement.
YV6GGY	1. Examinations showed that the tool marks present on Item 2 were not made by Item 1. 2. Examinations showed that the tool marks present on Item 3 were not made by Item 1.
Z39FUA	Toolmarks observed on Items 2 and 3 (pieces of zip-tie) are not identified or eliminated (inconclusive) as having been made by the same tool or being made by Item 1 (wire stripper). The individual characteristics observed do not display sufficient agreement.
Z4XU6R	Examination of the Item 1 wire strippers revealed them to bear multiple working surfaces. The wire cutting portion of Item 1 utilizes a shearing action. Examination of the Item 2 cable tie and the Item 3 cable tie revealed each to bear a toolmark on the cut end that was produced by a tool(s) that utilizes a shearing or pinching action. Test toolmarks were produced using the wire cutting portion of the Item 1 wire strippers and supplied cable ties of the same color, consistency and dimension. These test toolmarks are now itemized as Item 4. Due to a lack of sufficient corresponding microscopic marks of value, no conclusion could be reached as to whether the Item 2 or Item 3 cable ties had been cut by the Item 1 wire strippers. Due to a lack of sufficient corresponding microscopic marks of value, no conclusion could be reached as to whether the Item 2 and Item 3 cable ties had been cut by the same tool.
ZBWKGE	Upon examination, I found both Item 2 and Item 3 were not produced by Item 1.
ZG6Y7Q	Exhibit 1 is a pair of green Pro's Kit wire strippers. This tool utilizes several tool actions to include shearing and gripping. Exhibit 2 is a cut piece of cable tie measuring approximately 1 1/8" long and 1/4" wide having a striated toolmark on one end. This exhibit was cut with a tool that utilizes a shearing action. Exhibit 3 is a cut piece of cable tie measuring approximately 1 1/2" long and 3/16" wide having a striated toolmark on one end. This exhibit was cut with a tool that utilizes a shearing action. Test toolmarks were made using the submitted wire strippers (Exhibit 1) and submitted exemplar cable ties. The tests were retained with the evidence as Exhibits 1.T1-AT, 1.T1-AM, 1.T1-AB and 1.T3. Additional tests were made by cutting into lab supply silicone material, using the wire strippers in Exhibit 1. These tests were retained with the evidence as Exhibits 1.T2. The test toolmarks were microscopically compared to each other and to the cut cable ties (Exhibits 2 and 3). Based on a difference in class characteristics, Exhibit 2 was not cut by Exhibit 1. Based on an agreement of class characteristics, but neither a sufficient agreement nor disagreement of individual characteristics, Exhibit 3 could not be identified nor eliminated as having been cut by Exhibit 1.
ZMEZL3	1.I examined the cable ties marked Item 2 and Item 3 using a comparison microscope and found microscopic comparable marks which can possibly be utilized for individualization. 2.I examined the wire stripper marked Item 1 and made replications for test purposes and marked the tests Test 1 to Test 4. 3.I compared the individual and class characteristic markings on the exhibits and tests Item 2, Item 3 and Test 1 to Test 4 using a comparison microscope and found: 3.1 It cannot be determined if the cut marks on the cable ties Item 2&3 were or were not produced by the wire stripper marked Item 1.
ZVLW6Z	Toolmarks on item 2 and item 3 are produced by wire stripper "Item 1".

Additional Comments

TABLE 3

WebCode	Additional Comments
2ERU32	Discernible class characteristics were in agreement between the cut end of the cable tie, Item 3, and test cuts made using the wire stripper tool, Item 1, however, there was insufficient agreement of individual characteristics.
2F7YVK	Identification is achieved when a significant and unique similarity exists between test and questioned toolmark and there are no unexplained differences.
2KLLE4	The differences in the compared marks were not considered enough to eliminate. Test to Test comparisons also showed some differences; therefore, without more information, it is my opinion that the proper result is Inconclusive.
2X9QNL	The class characteristics were consistent between the tool marks on the cable tie in Item 3 and the tool marks produced on the test cuts using the wire strippers in Item 1, therefore, I could not eliminate. There was no significant similarities in individual characteristics observed for an identification.
39MAJ3	Exhibit cut cable tie Item 2 casted using Forensic Sil. Numerous test cuts using Item 1 were completed and all test cuts were also casted using Forensic Sil. The questioned cast of Item 2 was compared the most suitable test cut casts finding that there was only a small amount of agreement in some of the striated toolmarks but insufficient for an identification.
42HTL2	The toolmarks present on the submitted Item 2 and the test cuts made by Item 1 were found to be similar; however, sufficient agreement in the toolmarks could not be found to an amount that would warrant an identification.
447AVA	The marks made with the wire stripper Pos. 1 shows some similarities with marks on the wire tie Pos. 2 but they are not convincing enough to make a correlation between the two items.
46FAXV	Item 1.1 could neither be identified nor eliminated as having caused the damage to Items 1.2 and 1.3 due to a lack of corresponding individual characteristics. The combination of cable ties and wire strippers are less than ideal.
4B8C72	I have produced several tests on different mediums (provided cable ties, lead, different piece of plastic and rubber), and spent several hours Under the microscope. I was not able to find significant agreement on both items to make a match or an elimination.
6MTB73	Similar class present. No area of sufficient agreement found w/ multiple test cuts. Did not think lack of being able to find ID was sufficient for elimination but no areas of sufficient agreement found for an Identification.
6YQWMM	Methods: Toolmark Examination: Toolmarks, whether they are present on two evidence items or on one evidence item and one test-mark created in the Laboratory, undergo two stages of comparison. First, the toolmarks are examined to determine and compare their class characteristics. The class characteristics of toolmarks include type of cutting action and the size and orientation of gripping or cutting surfaces. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. A microscopic comparison examination consists of a search of the impressed and striated marks present in two toolmarks to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) Exclusion (Elimination): If two toolmarks or a tool and toolmark have incompatible class characteristics, an Exclusion opinion is rendered. 2) Identification: If the following conditions are met during the comparison of microscopic marks, an opinion of Identification is rendered: a) The degree of similarity is greater than the examiner has ever observed in previous evaluations of toolmarks known to have been created by different tools. b) The degree of similarity is equivalent to that normally observed in toolmarks known to have been created by the same tool. When these conditions are met the likelihood another tool could have produced the same mark is so remote as to be considered a practical impossibility. An Identification opinion cannot be reported unless a second qualified toolmarks

TABLE 3

WebCode	Additional Comments
	Examiner has examined the items in question and reached the same conclusion. 3) Inconclusive (No Conclusion): If the conditions required for an Exclusion or Identification are not observed, an opinion of Inconclusive is rendered. A failure to meet the conditions for an Exclusion or Identification could be the result of limited microscopic marks of value, a lack of any observed microscopic similarity, or microscopic similarity that is present but too limited to meet the criteria for identification. Limitations: Toolmark Examination: Firearms/Toolmark Identification is an empirical science that relies on objective measurements and a subjective comparison of microscopic marks of value. Due to changes in tool working surfaces from wear, corrosion and abuse or the employment of unusual tool/work piece orientations, toolmarks created by the same tool are not always identifiable as such.
79BQCN	Identification is achieved when a significant and unique similarity exists between the test and questioned toolmark and there are no unexplained differences.
7AP7HM	The conclusion is inconclusive because the overall class characteristics were the same but there was an insufficient agreement of individual characteristics.
7BZ978	From observations of the test cuts from Item1 with Item2 and Item3, there are similarities between class characteristics and some individual characteristics. However, the latter are insufficient in terms of number for identification.
7JB9ZH	Item 3 was inconclusive due to the small surface area width for evaluation. There were differences noted between Item 3 and Item 1 tests, but these could not be confirmed due to the small toolmark surface area as well as not having a second evidence item that was cut by the same tool as Item 3 to observe reproducibility of class and individual characteristics.
8692LD	Department policy dictates that we can not eliminate based upon individual characteristics only.
8N22BP	Items 2 and 3 possess similar class characteristics as the pair of wire cutters in Item 1. The wire cutters are a shearing type tool and produce a distinctive type of cut in that one side of the cut has a much sharper angle than the other. Both of the zip ties in Items 2 and 3 possess this type of cut. However, the individual characteristics present are insufficient for a more conclusive examination.
8WTPZZ	Item 3 was not eliminated from having been created using Item 1 because the tests and Item 3 exhibit similar class characteristics (action type, fine striated detail), and reproducibility of detail exhibited on Item 3 could not be established.
9KETPG	There are not enough individual marks on the exhibit marked Item 2 to conclusively say it is positive or not.
9RY3TX	The comparison has been performed with a comparative microscope with molds of the toolmarks and additional using ToolScan with the original material.
9ULRYJ	Item 2 could not be eliminated because there was not enough information to eliminate on individual characteristics in the scenario given; hence: The tool marks on Item 2 could not be identified or eliminated as having been made by Item 1 due to insufficient corresponding individual characteristics (inconclusive).
A2X7GE	The comparison microscope was used to compare crime-scene tool marks on the exhibits with tests impression and striation marks made with the susupect's tool. Corresponding marks were observed, but they were not good enough for individualization due to uncontrollable factors such as: Application of tool in a random position by the susupect. Poor reproduction of identification on tests due to elasticity and constriction abilities of the exhibit mateial when in contact with the tool.
AJKFFM	Tests to tests showed good agreement of individual characteristics in sufficient quantity and quality for identification. The toolmark on Item 2 had a significant amount of individual characteristics, but these marks showed limited similarities to Item 1 tests or Item 3. The toolmark on Item 3 showed a limited area of similar markings to test toolmarks, but Item 3 had limited individual characteristics present for comparison.

TABLE 3

WebCode	Additional Comments
AL4GLH	Laboratory policy requires a class difference in order to reach an exclusion conclusion.
BK6THD	Due to the lack of marks on exhibits and no follow is the reason for inconclusive result
BQYLQK	There are insufficient characteristics to include or exclude the submitted tool (Item 1) to the toolmarks in Items 2 and 3.
BTX7FR	Insufficient individual marks
CE26EN	Insufficient amount of individual microscopic differences to eliminate.
CG8Q3N	Items 2 and 3 were insufficient in quantity and quality of tool marks present to eliminate based on class or individual characteristics.
CGPLNW	Item 3 could neither be identified nor eliminated as having been damaged by item 1 (wire strippers). There is agreement of class characteristics but neither agreement nor disagreement of individual characteristics. Not enough individual characteristics to form conclusion.
CTEJQU	The toolmarks on the cable ties (items # 2 and 3) could neither be identified to nor excluded from the test toolmarks produced by the wire strippers (item # 1). Therefore, the results are inconclusive.
D27GKN	More differences of individual characteristics, but some agreement.
DCPNX4	Due to matching class characteristics but insufficient corresponding individual characteristics the cut on the submitted cable ties, Items 2 and 3, were neither identified nor eliminated as having been made by the submitted wire stripper, Item 1.
DKJYU8	Inconclusive - due to insufficient marks
EEEVRZ	Items 2 and 3 represent a small portion of the available cutting surface on Item 1. Defined class characteristics are not available on Items 2 or 3. Tests produced using Item 1 exhibit similar types of individual characteristics as present on # 2 and 3; lacks sufficient agreement for definitive conclusions.
EF7A6H	The individual characteristics on Items 2 and 3 could not be reproduced using the tool in Item 1.
EJ34RD	Tool: The type, action, and manufacturer of a tool are normally determined by directly observing the function and manufacturer markings on the tool in question. When these are not present, published materials and tool literature in the [Laboratory] Firearms/Toolmarks Unit reference library may be used to make determinations. When a microscopic comparison is necessary using a questioned tool, test samples are created using a test material that is softer or similar in quality to the item being compared. Toolmark Examination: Toolmarks, whether they are present on two evidence items or on one evidence item and one test-mark created in the Laboratory, undergo two stages of comparison. First, the toolmarks are examined to determine and compare their class characteristics. The class characteristics of toolmarks include type of cutting action and the size and orientation of gripping or cutting surfaces. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. A microscopic comparison examination consists of a search of the impressed and striated marks present in two toolmarks to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) Exclusion (Elimination): If two toolmarks or a tool and toolmark have incompatible class characteristics, an Exclusion opinion is rendered. 2) Identification: If the following conditions are met during the comparison of microscopic marks, an opinion of Identification is rendered: a) The degree of similarity is greater than the examiner has ever observed in previous evaluations of toolmarks known to have been created by different tools. b) The degree of similarity is equivalent to that normally observed in toolmarks known to have been created by the same tool. When these conditions are met the likelihood another

TABLE 3

WebCode	Additional Comments
	<p>tool could have produced the same mark is so remote as to be considered a practical impossibility. An Identification opinion cannot be reported unless a second qualified toolmarks Examiner has examined the items in question and reached the same conclusion. 3) Inconclusive (No Conclusion): If the conditions required for an Exclusion or Identification are not observed, an opinion of Inconclusive is rendered. A failure to meet the conditions for an Exclusion or Identification could be the result of limited microscopic marks of value, a lack of any observed microscopic similarity, or microscopic similarity that is present but too limited to meet the criteria for identification. Limitations: Tool: The results of tool examinations describe type and/or operating condition of the tool as it was received in the Firearms/Toolmarks Unit. Toolmark Examination: Firearms/Toolmark Identification is an empirical science that relies on objective measurements and a subjective comparison of microscopic marks of value. Due to changes in tool working surfaces from wear, corrosion and abuse or the employment of unusual tool/work piece orientations, toolmarks created by the same tool are not always identifiable as such.</p>
EP78MQ	The toolmarks present on items 2 and 3 were similar to the toolmarks present on the test cuts made with the Item 1 wire strippers, but did not exhibit sufficient agreement to warrant an identification or non-identification.
EXMERA	It is policy of the [State] Forensics Laboratory that the firearms section does not eliminate based on individual characteristics.
EYU2QM	Insufficient individual markings.
FAA8AG	There are similarities in the toolmarks on the cable tie Item 2 and toolmarks produced by the questioned wire stripper (Item 1). But there is not enough quantity of individual toolmarks to say more. We noticed, that the wire stripper has been used - because the paint was removed from the cutter surface and there were metal pieces.
FET3FU	Item A-3 has some striated marks, but also has some void/blank areas without striated marks. This could not be duplicated with the submitted tool. The lack of sufficient toolmarks in Item A-3 were possibly due to a poor cut.
G2WBC2	Most test cuts from the Item 01-01 wire stripper and the Item 01-03 cable tie had a ridge along the cut surface, consistent with being shearing marks. However, a ridge was not present when test cuts were made at a significant angle. A ridge was not present on the Item 01-02 cable. Due to the variability of test cuts at different angles and the lack of agreement or disagreement of individual characteristics, the Items 01-02 and 01-03 cable ties were unable to be identified or eliminated as having been cut by the same unknown tool or by the Item 01-01 wire stripper.
GCD7DA	Differences and some agreement of individual markings.
GCW4KT	Per [State] Police Forensic Science Division policy, evidence can not be eliminated on individual characteristics and can only be eliminated on class characteristics.
H9RXEL	Item 2 displayed a number of similar individual characteristics compared to those displayed on the test cuts - insufficient for identification purposes. Item 3 displayed different markings compared to the markings displayed on Item 2 and the tests cuts from Item 1. Although this can potentially allow for the elimination of the exhibit wire stripper (Item 1), as the responsible tool for cutting this exhibit, the small size of Item 2 and the ability to cut items on a multitude of angles prevented me from excluding this tool (Item 1)
HMBKNJ	Test marks were made using Item 1 and submitted test material. Five (5) test marks were recorded on the toolmark worksheet; however, roughly twenty (20) additional test marks were made with both the green and the black submitted test material. These additional tests, as well as the tests recorded, cover the expanse of the blade several times over. The striated surface of Item 2 (Green zip tie) measures approx. 3/16" in width with Item 3 (Black zip tie) measuring ~ 1/4". Item 2 is roughly the size of a 6R 9mm bullet land impression. The surface of Item 2 is also damaged, leaving even less microscopic

TABLE 3

WebCode	Additional Comments
	detail to evaluate. There is clearly not enough information to come to a reasonable conclusion in this CTS. Toolmarks are inherently more difficult than firearms comparisons due to the nature of the firearm being a fixed tool; where as a toolmark has several surfaces and positions to take into consideration. The blade surface of Item 1 appears to have been ground and has some areas of microscopic damage. This leads me to the opinion that the potential for subclass is relatively low; however, the surface quality and quantity present for evaluation for Items 2 and 3 (especially Item 2) is less than sufficient for identification or exclusion on individual characteristics to/from Item 1. At this time, with the present evidence, I am inconclusive in my result.
J2BL2K	The comparison of test cut to test cut was not strong; clear and unambiguous repeatability in the striae was lacking. The confidence in then declaring an elimination or an identification is greatly diminished and it would be foolhardy to do so under these circumstances. Hence, for this test kit, an inconclusive result for both Items is the only sensible finding. I think it likely that Item 3 may well have been cut with a different tool, despite the poor quality of the marks present. Some subtle features in the cut of Item 3 did not appear in my test cuts. An elimination is not possible however; it would amount to guessing.
JTRKCV	Item 2 and Item 3 did not display sufficient microscopic details to conclude whether or not the toolmarks that were present were made by Item 1. Based on what was observed, it appears more likely that Item 1 was not used to produce the toolmarks on Item 2 nor Item 3.
KUJWTF	Microscopic comparisons between Items 1B and 1C to tests from Item 1A did not display enough agreement nor disagreement to come to the conclusion of identification or exclusion. All discernible class characteristics were compatible between Items 1B, 1C and test cuts from Item 1A.
L6YA6G	No match was found between test cuts made using Item 1 and either of the cut cable ties. Test cuts were made in wax sheet, lead sheet and in the supplied cable ties. The test cuts in the lead and wax sheets matched each other but did not match the test cut made in the supplied cable tie. This showed that the detail imparted by the tool varies. For this reason I have not completely eliminated the possibility that Items 2 and 3 were cut by Item 1, although I consider this unlikely.
LEB3YK	Multiple test cuts were made in order to try and repeat the cutting angle and surface. On initial observation there was an oil substance found on the cutters. Additionally depending on which motion was used to close the cutters it would vary at where the V cut would be produced. The ripping and tearing on the submitted material made it difficult to reproduce test cuttings.
M3PF8V	The small surface area on the submitted cable ties limits the ability to discern whether the cable ties have class characteristics consistent with a shearing type tool. Additionally, tests made with the submitted wire stripper/cutter, when used at an angle, are able to produce tests with primarily one cut side. Comparison of individual characteristics indicates insufficient agreement or disagreement of individual characteristics for either identification or elimination, respectively.
MK7JPG	The test cut material was not suitably reproducing detail between the test cuts to reliably allow for an identification or elimination of the exhibit tool. The tool item 1 is an opposed jaw cutting tool (shearing) that presented as new condition with no obvious sign of wear and tear, damage or corrosion on the tool surfaces. Both blades of item 1 (Top & Bottom) were found to contain a series of corrugation and striated agreement of sub class characteristics along the entire length of the cutting surfaces which could be matched to each other, indicating that both blades were fabricated by the same tool in the same approximate state of wear.
NMUHGK	The inconclusive findings for Items 2 and 3 resulted from agreement of all discernible class characteristics, and some disagreement of individual characteristics, but insufficient for an elimination.
P3FFYQ	The black cable tie (item 01-02) was cut by a pinching class tool, including but not limited to wire cutters. The green cable tie (item 01-03) was cut by a single blade tool, including but not limited to knives and box cutters.
PBRJ3J	The test was challenging, interesting and fair.

TABLE 3

WebCode	Additional Comments
QC9TW6	The characteristics present on test cuts from the tool in Item 1 are insufficient for inclusion or exclusion to the cuts on Items 2 and 3. A majority of test cuts produced by Item 1 had stress marks in the material that made comparison difficult. These stress marks were not present on Items 2 and 3.
QL6ZAG	Item 3 exhibits similar class characteristics to toolmarks created using Item 1. However, correspondence of detail is insufficient for identification and differences in detail are insufficient for elimination.
QULHYW	NOT ENOUGH DISAGREEMENT ON ITEM 2 - THEREFORE INCONCLUSIVE. NOT ENOUGH AGREEMENT ON ITEM 3 - THEREFORE INCONCLUSIVE
QYUZV4	A tool may be recovered that is suspected to have caused damage and this will also be taken to the lab for further analysis. Forensic examiner will make tests marks using suspect implement. The test mark and the mark recovered from crime scene will be compared. Forensic examiner will examine and compare striation pattern using comparison microscope. Comparison and matching the striation to examiner can prove whether the tool is responsible for the impression.
RLLHXA	Insufficient individual characteristics.
RNPVZ3	Through a comparison microscope, a forensic analyst must be able to get a result by comparing patterns and striations. The wire stripper did not cut the cable ties.
T9BJFZ	Do to a lack of matching individual characteristics no identification could be made. The tool was difficult to match even between test cuts of the same area of the blade.
TAU3ND	With regard to the results obtained from the performed comparative analysis with the use of above-mentioned methods we conclude that the wire stripper (item 1) most probably was not used to cut cables marked item 2 and 3 because general appearance of the intersection is different but on evidence cables we do not found any characteristic for tools. Thus, our results in this case are inconclusive.
TBZWXH	Item #1 Pros'Kit CP-301G wire cutter. Black in color with green grips. The wire cutter was marked to identify top and bottom left and right of the cutting edges. Top right side is TP A1, Bottom right side is BT B1, top left side TP A2 and bottom left side BT B2. No trace evidence observed prior to cutting. Item #2, 1-1/8" portion of a black zip tie. (Blue paint on one end of zip tie). Item #3, 2-1/4" portion of a green zip tie. (Red paint on one end of zip tie. Red paint came off during examination therefore that end was painted with whiteout). Microscopic Comparisons Test A1 VS A1 Identification QCMS-OK. (See Microphotographs for identification.) Test A2 VS A2 Identification QCMS-OK. Test standards VS Item #2 Inconclusive Some agreement of individual characteristics and all discernible class characteristics, but insufficient for an identification. Test standards VS Item #3 Inconclusive Agreement of all discernible class characteristics and disagreement of individual characteristics, but insufficient for an elimination. [Participant submitted data in a format that could not be reproduced in this report.]
TCE3Q2	The exhibits received and the tests that was cut were the same type of material (cable ties).
THG9BJ	Because the cuts were small and all orientations and usage of the cutter (twisting while cutting, angled while cutting, stress on the cable when cut for example)could not be tested, this tool was not eliminated. Therefore,inconclusive rather than absolute elimination was selected since a class elimination was not supported.
VPDN7W	Methods: Tool: The type, action, and manufacturer of a tool are normally determined by directly observing the function and manufacturer markings on the tool in question. When these are not present, published materials and tool literature in the Firearms/Toolmarks Discipline reference library may be used to make determinations. When a microscopic comparison is necessary using a questioned tool, test samples are created using a test material that is softer or similar in quality to the item being compared. Toolmark Examination: Toolmarks, whether they are present on two evidence items or on one evidence item and one test-mark created in the Laboratory, undergo two stages of comparison. First, the toolmarks are examined to determine and compare their class characteristics. The class

TABLE 3

WebCode	Additional Comments
	<p>characteristics of toolmarks include type of cutting action and the size and orientation of gripping or cutting surfaces. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. A microscopic comparison examination consists of a search of the impressed and striated marks present in two toolmarks to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) Exclusion (Elimination): If two toolmarks or a tool and toolmark have incompatible class characteristics, an Exclusion opinion is rendered. Exclusion opinions based on general differences are not required to be verified. However, an exclusion opinion based on a minor difference in a measured class characteristic cannot be reported unless a second qualified firearms/toolmarks Examiner has examined the items in question and reached the same conclusion. 2) Identification: If the following conditions are met during the comparison of microscopic marks, an opinion of Identification is rendered: a) The degree of similarity is greater than the examiner has ever observed in previous evaluations of toolmarks known to have been created by different tools. b) The degree of similarity is equivalent to that normally observed in toolmarks known to have been created by the same tool. When these conditions are met the likelihood another tool could have produced the same mark is so remote as to be considered a practical impossibility. An Identification opinion cannot be reported unless a second qualified toolmarks Examiner has examined the items in question and reached the same conclusion. 3) Inconclusive (No Conclusion): If the conditions required for an Exclusion or Identification are not observed, an opinion of Inconclusive is rendered. A failure to meet the conditions for an Exclusion or Identification could be the result of limited microscopic marks of value, a lack of any observed microscopic similarity, or microscopic similarity that is present but too limited to meet the criteria for identification. Limitations: Tool: The results of tool examinations describe type and/or operating condition of the tool as it was received in the Firearms/Toolmarks Discipline. Toolmark Examination: Firearms/Toolmark Identification is an empirical science that relies on objective measurements and a subjective comparison of microscopic marks of value. Due to changes in tool working surfaces from wear, corrosion and abuse or the employment of unusual tool/work piece orientations, toolmarks created by the same tool are not always identifiable as such.</p>
W3YCRR	In our laboratory reports are not given if there is not mark left by " bottom" of the tool used.
W9NYA7	Some marks are visible but were not able to replicate the markings found on items 2 and 3. It is possible that the angles by which the replicas are made differs.
WCPV9L	Agreement in available class characteristics but a lack of consistent and repeatable individual marks.
WRKEPA	<p>There is lengthy documentation in worksheet explaining lengthy & tedious examination process; not reproduced below. Condensed version as follows: Inter-comparison of Item 1.1 test cuts to each other (test to test) revealed good agreement of class and individual characteristics both within and between the longitudinal and cross-wise test cuts. The Items 2 and 3 cable ties and test toolmarks from the Item 1 wire stripper were examined and microscopically compared to each other with the following result: There is agreement of class (shearing), some agreement of gross morphological features, and some agreement of individual characteristics between Items 2 and 3 and test toolmarks from Item 1 wire stripper, but insufficient to ID or eliminate. Items 2 and 3 reported as inconclusive to Item 1 and to each other.</p>
XFJEMP	Section policy does not allow for eliminations based on differences in individual characteristics in toolmark comparisons. Section policy does not allow for the inter-comparison of unknown toolmarks; only comparisons to a known tool is permitted.
XH9K72	Inconclusive - Agreement of all discernible class characteristics and disagreement of individual characteristics, but insufficient for elimination.
XXM2F7	<p>The inconclusive results on both Item 2 and Item 3 was owing to a lack of corresponding individual characteristics. Item 3: This item was damaged which rendered it unusable for further examination. However, Item 3 was considered inconclusive during testing prior to this damage. The damage occurred when trying to reduce contrast in Item 3 and on my test cuts that I was making in the submitted test</p>

TABLE 3

WebCode	Additional Comments
	material that was producing what I would call 'blanching' that turned the normally black plastic to white having the appearance of glare coming from the test cut surface. It wasn't glare. The black plastic actually turned very white near the point of the test cut where the pinching occurs. Although the white interference was distracting when trying to compare the test cuts to the black (dark gray) Item 2, several successful test-to-test comparisons were made. Therefore, the effect of the interference/blanching/'glare' (on Item 3) in the inability to arrive at a definitive conclusion is unclear.
XT8F4W	Justification for Inconclusive. Microscopic comparison disclosed an agreement of class characteristics, but no significant agreement or disagreement of individual characteristics. Examination of Exhibit #3 disclosed a very rough group of striations and a rounded over profile of the edge of the cut. Test standards from Exhibit #1 disclosed very fine striations except near the mouth of the tool. In addition the profile of the test cuts are very square and not rounded over. Due to not having multiple cuts from Ex #3 and some agreement and disagreement of individual characteristics I went Inconclusive.
XVDZRW	Section at end of report: TECHNICAL NOTES: Class characteristics are defined as measurable features of a firearm/tool, which indicate a restricted group source. They result from design features and are determined prior to manufacture of the firearm/tool. Individual characteristics are defined as marks produced by the random imperfections or irregularities of firearm/tool surfaces. These random imperfections or irregularities can be either produced incidental to manufacture or caused by use, corrosion, or damage, and are unique to that specific tool. Any conclusions indicating that a toolmark was made by a specific firearm/tool are not to the absolute exclusion of all other firearms/tools, because it is not feasible to examine all firearms/tools. However, observing this amount of agreement between different sources is considered extremely remote. Justification for inconclusive: The class characteristics were the same between Exhibit 1 and Exhibit 3 and some of the rough striations agreed between the evidence and the test marks. This prevented an elimination. However, that agreement of individual characteristics was not enough for a conclusion of identification. Therefore, it could not be determined if the toolmarks on the Exhibit 3 ziptie were made by the Exhibit 1 tool.
Y7QHYT	A. As a result of microscopic comparison, it was concluded that Exhibits 1.1, 2, and 3 could not be identified or eliminated as having been cut by the same tool. While the individual characteristics of the test standards, Exhibit 1.1 were observed to reproduce, there was an absence of fine striae observed when compared to Exhibits 2 and 3, as well as when Exhibits 2 and 3 were compared to one another. Pertaining to the Test: The test marks from the tool were difficult to ID to one another. The individual characteristics did not readily reproduce in any media. A series of multiple test toolmarks were created for the purpose of microscopic comparison.
YQWVM	Laboratory protocol prohibits eliminations being made on differing individual characteristics. The class characteristics are the same for the submitted tool (Item 1) and the damage sustained on the submitted cable ties (Items 2 and 3). Also, elimination could not be made due to the fact that the tool may have been re-sharpened after the tool marks were made on items 2 and 3.
ZG6Y7Q	REASONS FOR INCONCLUSIVE: 1. Limited surface area available on Ex 3. 2. Poor quantity of striae on Ex 3 especially on anvil side. 3. Inconsistent replication of test toolmarks. 4. Unable to replicate toolmark with the tool due to the tool changing - dulling or build up of plastic in surface contours.
ZMEZL3	There are some agreement of individual characteristic markings but also disagreement of individual characteristic markings.

-End of Report-
(Appendix may follow)

Appendix: Data Sheet

Collaborative Testing Services ~ Forensic Testing Program Test No. 18-529: Toolmarks Examination

DATA MUST BE RECEIVED BY November 12, 2018 TO BE INCLUDED IN THE REPORT

Participant Code:

WebCode:

Accreditation Release Section

CTS submits external proficiency test data directly to ASCLD/LAB, ANAB, and 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 on the last page must be completed and submitted.)
- This participant's data is **NOT** intended for submission to ASCLD/LAB, ANAB or A2LA.

Scenario:

Police are investigating a homicide at an industrial park. Two cable ties were used to bind the hands and feet of the victim. A security video captured a white van, including a license plate number, entering and exiting the industrial park late at night. Police arrested the owner of the van the following day and seized a set of wire strippers from his van. Investigators have removed the cut end of each cable tie and are requesting that you examine the cable tie sections and determine if any were cut using the suspect's wire strippers.

Please note the following:

- Each Item is in a labeled envelope, it is suggested that when the items are removed from their labeled envelopes, they be marked sufficiently using laboratory procedure.
- To assist in distinguishing which end NOT to be examined, the end of the Item 2 and Item 3 cable tie pieces have been painted.

Items Submitted (Sample Pack T2):

- Item 1: Wire stripper recovered from suspect.
- Item 2: First cable tie recovered from scene (marked with blue paint).
- Item 3: Second cable tie recovered from scene (marked with red paint).

1.) Were the suspect toolmarks on either of the cable ties (Items 2 and 3) produced by the questioned wire stripper (Item 1)?

Item 2	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Inconclusive*	<input type="checkbox"/>
Item 3	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	Inconclusive*	<input type="checkbox"/>

*Should an item(s) be marked "Inconclusive", please document the reason in the Additional Comments section of this data sheet.

Please return all pages of this data sheet.

Collaborative Testing Services ~ Forensic Testing Program

RELEASE OF DATA TO ACCREDITATION BODIES

The following Accreditation Releases will apply only to:

Participant Code:

WebCode:

for Test No. **18-529: Toolmarks Examination**

This release page must be completed and received by **November 12, 2018** to have this participant's submitted data included in the reports forwarded to the respective Accreditation Bodies.

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

Signature and Title _____

Laboratory Name _____

Location (City/State) _____

Accreditation Release	
<u>Return Instructions</u>	
<i>Please submit the completed Accreditation Release at the same time as your full data sheet. See Data Sheet Return Instructions on the previous page.</i>	<i>Questions? Contact us 8 am-4:30 pm EST Telephone: +1-571-434-1925 email: forensics@cts-interlab.com</i>

Please return all pages of this data sheet.