Toolmarks Examination Test No. 14-529 Summary Report

This test was sent to 294 participants. Each sample set contained a screwdriver (Item 1) and two paint can lids containing questioned toolmarks (Items 2 and 3). Participants were requested to examine these items and report their findings. Data were returned from 240 participants (82% response rate) and are compiled into the following tables:

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

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

Manufacturer's Information

Each sample set contained a screwdriver (Item 1), two paint can lids containing questioned toolmarks (Items 2 and 3) and two additional paint can lids for test mark purposes. Participants were requested to determine which, if any, of the questioned toolmarks were made by the submitted tool. The questioned toolmarks on the Item 2 and Item 3 paint can lids were produced by the Item 1 screwdriver.

SAMPLE PREPARATION-
Items 2 and 3, as well as the two additional paint can lids for test mark purposes, were 1/2 pint paint can lids. The Item 2 paint can lids were painted with a blue line that was parallel to the grain of the metal. The Item 3 paint can lids were painted with a red line that was parallel to the grain of the metal. Each screwdriver (Iron Bridge 2in. X 4in. Slotted Head Screwdriver) was inspected for defects. The screwdrivers were used to strike spare paint can lids several times to remove manufacturing residue. This process was done to break in the tools.

Items 1, 2, and 3 (IDENTIFICATION MARKS): The Item 1 screwdriver was held vertically to the Item 2 paint can lid. The Item 2 paint can lid, laying on a flat surface, was struck parallel to the blue painted line with a rubber mallet and packaged into a pre-labeled Item 2 envelope. The Item 1 screwdriver was held vertically to the Item 3 paint can lid. The Item 3 paint can lid, laying on a flat surface, was struck perpendicular to the red painted line with a rubber mallet and packaged into a pre-labeled Item 3 envelope. The corresponding Item 1 screwdriver and matching Item 2 and Item 3 paint can lids were immediately assembled into the sample pack as described below. The above process was repeated until all identification toolmarks had been prepared.

SAMPLE SET ASSEMBLY: The corresponding Item 1 screwdriver and the Item 2 and Item 3 paint can lids were packaged into a pre-labeled sample set box. Two additional paint can lids were included for testing purposes. This process was repeated until all of the sample sets were prepared. Once verification was completed, the sample sets were sealed with evidence tape and initialed "CTS."

VERIFICATION:
In addition to the sets examined by predistribution laboratories, 10 sample sets were examined by a qualified tool mark examiner who confirmed the expected identification between Items 1, 2, and 3.

Release Date of Manufacturer's Information: 18-February-2015

Summary Comments

This test was designed to allow participants to assess their proficiency at a toolmark examination involving impression type toolmarks. Each sample set consisted of one screwdriver (Item 1) and two paint can lids (Items 2 and 3) containing the questioned toolmarks. Participants were requested to determine if the recovered screwdriver produced either of the questioned toolmarks on the paint can lids. The Item 2 and Item 3 paint can lids were indented by the Item 1 screwdriver. (Refer to Manufacturer's Information for sample preparation details).

Of the 240 responding participants, 230 (96%) identified the Item 1 screwdriver as having caused the marks on both the Item 2 and Item 3 paint can lids. Seven participants were inconclusive as to whether or not the Item 1 screwdriver was responsible for the marks on the Item 2 and Item 3 paint can lids. Two participants were inconclusive for the Item 1 screwdriver causing the marks on the Item 2 paint can lid and identified the Item 1 screwdriver as having caused the marks on the Item 3 paint can lid. The remaining participant identified the Item 1 screwdriver as having caused the marks on the Item 2 paint can lid and eliminated the Item 1 screwdriver as being responsible for the marks on the Item 3 paint can lid.

Release Date of Summary Report: 10-March-2015

Examination Results

Were the suspect toolmarks on either or both of the paint can lids (Items 2 and 3) produced by the questioned screwdriver (Item 1)?

TABLE 1

WebCode	Item 2	Item 3	WebCode	Item 2	Item 3
226L64	Yes	Yes	4G9GFV	Yes	Yes
26L6FT	Yes	Yes	4HLFN6	Yes	Yes
28DMQ8	Yes	Yes	4JFUJA	Yes	Yes
28RHNZ	Yes	Yes	4JGJCT	Yes	Yes
2C4X7J	Yes	Yes	4NBQ7F	Yes	Yes
2ECQLR	Yes	Yes	4P4E86	Yes	Yes
2F74W4	Yes	Yes	4QGQAF	Yes	Yes
2K2JGR	Yes	Yes	4T86HQ	Yes	Yes
2M7URA	Yes	Yes	634JQ3	Yes	Yes
2Q78BT	Yes	Yes	64WDQR	Yes	Yes
2X4WTH	Yes	Yes	66TEK3	Yes	Yes
2XL7KX	Yes	Yes	67MYC9	Yes	Yes
322VJ2	Yes	Yes	6AM4C9	Yes	Yes
36Z8LT	Yes	Yes	6MCZD7	Yes	Yes
37DMQT	Yes	Yes	6UPNU9	Yes	Yes
38L3WY	Yes	Yes	7BEWR7	Yes	Yes
3M4LXF	Yes	Yes	7EF39X	Yes	Yes
43PYY7	Yes	Yes	7F9V2V	Yes	Yes
446BM4	Yes	Yes	7GGQFD	Yes	Yes
49YGXY	Yes	Yes	7K6GX6	Yes	Yes
4CDP8Y	Inc	Inc	7LZ6CT	Inc	Yes
4FK7ZG	Yes	Yes	7MPJLP	Yes	Yes

TABLE 1

WebCode	Item 2	Item 3	WebCode	Item 2	Item 3
7PCEXW	Yes	Yes	AQF4VP	Yes	Yes
7UM9D2	Yes	Yes	AZ33LU	Yes	Yes
7WCPBF	Yes	Yes	AZ3ZYB	Yes	Yes
7ZWCAV	Yes	Yes	B3LCD8	Yes	Yes
87F4UT	Yes	Yes	B4G2CU	Yes	Yes
87GYFK	Yes	Yes	BG26PX	Yes	Yes
8AZUHC	Yes	Yes	BHHQD2	Yes	Yes
8CRDGA	Yes	Yes	BNA93Q	Yes	Yes
8PABDX	Yes	Yes	BPYTRV	Yes	Yes
9HBX22	Yes	Yes	BTZ98T	Yes	Yes
9HM8W3	Yes	Yes	BY769Y	Yes	Yes
9HT8QW	Yes	Yes	BYCKGT	Yes	Yes
9JZ2BH	Yes	Yes	C4BNHC	Yes	Yes
9JZ4ZL	Yes	Yes	C6A2GK	Yes	Yes
9REPAP	Yes	Yes	C6UAGU	Yes	Yes
9X38R8	Yes	Yes	C8BB48	Yes	Yes
9XHVKM	Yes	Yes	C8BDRQ	Yes	Yes
A6FVML	Yes	Yes	C8CB3M	Inc	Yes
A8KDVP	Yes	Yes	CCAPRX	Yes	Yes
A8PEUB	Yes	Yes	CEYGWT	Yes	Yes
A9VDWP	Yes	Yes	CK26EF	Yes	Yes
AELKH6	Yes	Yes	CNKK28	Yes	Yes
AMCB2Q	Yes	Yes	CY3GAF	Yes	Yes
AMVK2Y	Yes	Yes	CYGQV7	Yes	Yes

TABLE 1

WebCode	Item 2	Item 3	WebCode	Item 2	Item 3
D3LGZZ	Yes	Yes	GCU4ZH	Yes	Yes
D4URRX	Yes	Yes	GDNKJ7	Yes	Yes
D7VCKH	Yes	Yes	GHX4HY	Yes	Yes
DAXX8Z	Yes	Yes	GL239C	Yes	Yes
DBPF8V	Yes	Yes	GQBTHT	Yes	Yes
DDG8N8	Yes	Yes	GW4XCW	Yes	Yes
DHQVB3	Yes	Yes	GXAKMF	Yes	Yes
DLC83Z	Yes	Yes	GZHUED	Yes	Yes
E7WWYQ	Yes	Yes	HA2B2T	Yes	Yes
E9KMR9	Yes	Yes	HCPY67	Yes	Yes
EBL9ME	Yes	Yes	HJBV9V	Yes	Yes
EENEDY	Yes	Yes	HLV83C	Yes	Yes
ENUNV6	Yes	Yes	HLVXXF	Yes	Yes
EQJQMQ	Yes	Yes	JCJ62Q	Yes	Yes
ERVHJE	Yes	Yes	JFLG7J	Yes	Yes
EXYJMU	Yes	Yes	JH8P67	Yes	Yes
EYH97A	Yes	Yes	JTPGLN	Yes	Yes
F9XEKP	Yes	Yes	JVG6BB	Yes	Yes
FAAQ4A	Yes	Yes	JVGXVG	Yes	Yes
FJWPWZ	Yes	Yes	JZCY9C	Yes	Yes
FMKMGQ	Yes	Yes	JZTBPW	Yes	Yes
FTGQZT	Yes	Yes	K2YQKL	Yes	Yes
FXFAE9	Yes	Yes	K3UN2N	Yes	Yes
G7QVZG	Yes	Yes	K3W9X4	Yes	Yes

TABLE 1

WebCode	Item 2	Item 3	WebCode	Item 2	Item 3
K7Y89W	Yes	Yes	MVBD6J	Yes	Yes
K9KLLQ	Yes	Yes	MWHAGV	Yes	Yes
KNE9RH	Yes	Yes	NC9P27	Yes	Yes
KNWWDJ	Yes	Yes	NF7DA2	Yes	Yes
KP9MMN	Yes	Yes	NF8D9F	Yes	Yes
KW322U	Yes	Yes	NGY9T4	Yes	Yes
L6DXTZ	Inc	Inc	NHEU2X	Yes	Yes
L7TC4G	Inc	Inc	NK3Y4P	Yes	Yes
LH7GBC	Yes	Yes	NQAD49	Yes	Yes
LKCYA9	Yes	Yes	NVLE9C	Inc	Inc
LL38DH	Yes	Yes	NWGKHW	Yes	Yes
LNA4XR	Yes	Yes	NXRAZM	Yes	Yes
LNU2C8	Yes	Yes	PAHMCP	Yes	Yes
LRQTHJ	Yes	Yes	PK2RUM	Yes	Yes
LV8BHF	Yes	Yes	PMKNWZ	Yes	No
LXFNJ9	Yes	Yes	PPUY6H	Yes	Yes
MAALLX	Yes	Yes	PQPJVN	Yes	Yes
MCBZEC	Yes	Yes	PVDR8P	Yes	Yes
MG66MM	Yes	Yes	PXMNUE	Yes	Yes
MJUC8K	Yes	Yes	Q7ELW8	Yes	Yes
MN6MYE	Yes	Yes	QADK3B	Yes	Yes
MPXAYW	Yes	Yes	QBPPPV	Yes	Yes
MRKVPY	Yes	Yes	QF3CJZ	Inc	Inc
MUD6WZ	Yes	Yes	QH8Z3V	Yes	Yes

TABLE 1

WebCode	Item 2	Item 3	WebCode	Item 2	Item 3
QKTCQK	Yes	Yes	V8BK39	Yes	Yes
QNY6XK	Yes	Yes	VEWY3E	Yes	Yes
QP6PLL	Yes	Yes	VGD762	Yes	Yes
QQZYMV	Yes	Yes	VGWGUE	Yes	Yes
QRBBAL	Yes	Yes	VHBLTC	Inc	Inc
QZNP9M	Yes	Yes	VN2NMJ	Yes	Yes
RLLVHT	Yes	Yes	VULLDR	Yes	Yes
RLLX7C	Inc	Inc	VUNYRR	Yes	Yes
RNAR4J	Yes	Yes	WGT6WA	Yes	Yes
T4JT3Z	Yes	Yes	WRC3LA	Yes	Yes
TALTC3	Yes	Yes	WXHR8N	Yes	Yes
TD47V6	Yes	Yes	X38NAJ	Yes	Yes
TGLRYQ	Yes	Yes	XA9E23	Yes	Yes
THGGYD	Yes	Yes	XG8TTV	Yes	Yes
TMURZ3	Yes	Yes	XK6G4B	Yes	Yes
TWXCEA	Yes	Yes	XMFX8V	Yes	Yes
UGZMVH	Yes	Yes	XN8RA7	Yes	Yes
UKHC9M	Yes	Yes	YK6WXM	Yes	Yes
UUPRFV	Yes	Yes	YPF8C7	Yes	Yes
UUPU6Y	Yes	Yes	YRNELQ	Yes	Yes
UZVK86	Yes	Yes	YVK6KA	Yes	Yes
V27CN7	Yes	Yes	YZX4W4	Yes	Yes
V27EDB	Yes	Yes	ZECY36	Yes	Yes
V6JR2X	Yes	Yes	ZPEGD8	Yes	Yes

TABLE 1

WebCode	Item 2	Item 3	WebCode	Item 2	Item 3
ZUN66B	Yes	Yes			
ZUURRB	Yes	Yes			
ZW3XDC	Yes	Yes			
ZZX6H2	Yes	Yes			

Response Summary

Total Participants: 240

Were the suspect toolmarks on either or both of the paint can lids (Items 2 and 3) produced by the questioned screwdriver (Item 1)?

		ITEM 2	ITEM 3
Responses	Yes	**231** *(96.3%)*	**232** *(96.7%)*
	No	**0** *(0.0%)*	**1** *(0.4%)*
	Inc	**9** *(3.8%)*	**7** *(2.9%)*

Conclusions

TABLE 2

WebCode	Conclusions
226L64	Item 1 (a screwdriver) produced the toolmarks on Items 2 and 3 (paint can lids).
26L6FT	Examination of the two (2) paint can lids, submitted as items #2 and #3, revealed the presence on a single impressed tool mark in the center area of each of the lids. Microscopic comparisons of the impressed tool marks on the paint can lids, items #2 and #3, to test marks made by the flat bladed screwdriver, submitted as item #1, revealed matching class and individual characteristics. These findings confirm that the impressed tool marks on the paint can lids, items #2 and #3, were made by the submitted screwdriver, item #1. Test marks made on the blank paint can lids, also submitted in item #1, are being returned with the other items of evidence.
28DMQ8	The tool marks located on the Q-1 and Q-2 paint can lids were produced by the K- 1 screwdriver.
28RHNZ	Items 1, 2 and 3 were examined and analyzed using microscopy. Toolmarks present on items 2 and 3 were identified as having been produced by the item 1 screwdriver. Four (4) test marks were produced in laboratory stock material using the item 1 screwdriver. The test marks are being returned as item 1T in container 1 and should be maintained for possible future examinations.
2C4X7J	Test impressions were created using the slotted screwdriver, item 1, and microscopically compared with the impressed toolmarks exhibited on the paint can lids from Items 2 and 3. Based on agreement of discernible class characteristics and sufficient matching individual detail, the impressed toolmarks displayed on the paint can lids from Items 2 and 3 were identified as having been created using the slotted screwdriver, Item 1.
2ECQLR	Microscopic comparisons of the toolmarks from Items #2 and 3 with test marks produced by the screwdriver in Item #1 revealed matching individual characteristics. This finding confirms that the toolmarks in Items #2 and 3 were produced by the screwdriver from Item #1.
2F74W4	The paint can lids in Items 2 and 3 were examined and found to each exhibit an impressed toolmark. These toolmarks were determined to exhibit the same class characteristics as the tip of the screwdriver in Item 1. The toolmarks in the paint can lids in Items 2 and 3 were microscopically compared to test toolmarks made with the screwdriver in Item 1 and were determined to have been made by this screwdriver.
2K2JGR	The toolmarks on the paint can lids (items 1.2 and 1.3) were identified as having been produced by the screwdriver (item 1.1).
2M7URA	The marks on the paint can lids were produced by the screwdriver.
2Q78BT	The evidence in items 1, 2, and 3 was analyzed by physical and microscopic examination. The toolmarks present on the two (2) paint can lids in items 2 and 3 were determined to have been made by the screwdriver in item 1.

TABLE 2

WebCode	Conclusions
2X4WTH	3. On 2015-01-13 during the performance of my official duties I received a sealed evidence bag with number PA4002453517 from Case Administration of the Ballistics Section, containing the following exhibit: 3.1. One (1) Unknown manufactured CR-V 1/4 x 4" black and red screwdriver, marked by me "8677/15 Item 1". 3.2 Two (2) paint can lids marked by me, each "8677/15" and respectively "Item 2" and "Item 3". 4. The intention and scope of this forensic examination comprise of the following: 4.1 Microscopic individualization of toolmarks. 5. During my examination of the screwdriver and paint can lids mentioned in paragraphs 3.1 and 3.2 I made tests for microscopic comparison purposes marked by me 8677T1 and 8677T2. 6. I examined the paint can lids mentioned in paragraph 3.2 using a comparison microscope and found microscopic comparable marks which can possibly be utilized for individualization. 7. I compare the individual and class characteristic markings on the paint can lids mentioned in paragraph 3.2 marked each "8677/15" and respectively "item 2" and "item 3" and the tests mentioned in paragraph 5 using a comparison microscope and found: 7.1 The marks on the paint can lids mentioned in paragraph 3.2 marked each "8677/15" and respectively "item 2" and "item 3 " were produced by the screwdriver mentioned in paragraph 3.1 marked "8677/15 Item 1".
2XL7KX	The individual marks on the paintlids (item 2 and 3) were produce by the screwdriver marked item 1.
322VJ2	I compared the individual and class characteristic markings on the exhibit and test casts marked 247296/14 C2, C3 and 296 R1 - 296R4 using a comparison microscope and found: The marks on the paint can lids marked 247296/14 2 and 3 were produced by the screwdriver marked 247296/14 1.
36Z8LT	The toolmarks observed on submissions 2 and 3 were produced by the screwdriver in submission 1.
37DMQT	Item #1 (screwdriver) was examined and impression test marks were made on the provided media (item #4) being a small paint can type lid, similar to items #2 and #3. Microscopic examination and comparison identified the impression tool marks on items #2 and #3 as having been made by item #1 (screwdriver).
38L3WY	Item 1-1, the submitted screwdriver, was microscopically examined. A small piece of thin, metallic material was found adhering to the magnetic working edge of item 1-1 and was collected. A silicone cast was made of the working surface of the tip of the screwdriver. The screwdriver was subsequently used to make test impressions in a metal paint can lid. Item 1-2 and 1-3, metal paint can lids each bearing an apparent screwdriver tip impression, were examined. All class characteristics of these impressions agreed with those of item 1-1. A microscopic comparison of the silicone cast and test toolmarks produced by item 1-1 with the marks on items 1-2 and 1-3 revealed a sufficient amount of agreement of individual characteristics to establish that the marks on items 1-2 and 1-3 were made by item 1-1. This identification is made to the practical, not absolute, exclusion of all other tools.

TABLE 2

WebCode	Conclusions
3M4LXF	3. On 2014-12-04 during the performance of my official duties I received a sealed evidence bag with number PA4002453856 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) sealed box marked "test No. 14-529: Toolmarks Examination", containing the following: 3.1.1 One (1) screwdriver with a black and red handle marked "test No. 14-529 Item 1". 3.1.2 One (1) envelope marked "Test No. 14-529 Item 2", containing the following exhibit: 3.1.2.1 One (1) paint can lid marked with blue paint marked by me "247309/14 2". 3.1.3 One (1) envelope marked "Test No. 14-529 Item 3", containing the following exhibit: 3.1.3.1 One (1) paint can lid marked with red paint marked by me "247309/14 3". 3.1.4 One (1) unmarked paint can lid marked by me "247309/14 Test 1". 3.1.5 One (1) unmarked paint can lid marked by me "247309/14 Test 2". 4. The intention and scope of this forensic examination comprise of the following: 4.1 Examination of tools and toolmark related materials. 4.2 Microscopic individualization of toolmarks. 5. I examined the screwdriver mentioned in paragraph 3.1.1 and made replications for test purposes using the paint can lids mentioned in paragraphs 3.1.4 and 3.1.5 which were marked by me "247309/14 Test 1" and "247309/14 Test 2". 6. I compared the individual and class characteristic markings on the paint can lids mentioned in paragraphs 3.1.2.1, 3.1.3.1 and paragraph 5 using a comparison microscope and found: 6.1 The marks on the paint can lids mentioned in paragraph 3.1.2.1 and 3.1.3.1 were produced by the screwdriver mentioned in paragraph 3.1.1.
43PYY7	The Item 2 and Item 3 toolmarks were made by the Item 1 screwdriver.
446BM4	The tool marks on the submitted paint can lids (Items 2 and 3) were produced by the screwdriver (Item 1).
49YGXY	Items A1-1 and A1-2: The impression toolmark on the item A1-2 can lid is consistent in class characteristics with the item A1-1 submitted screwdriver. Item A1-3: The impression toolmark on the item A1-3 can lid is consistent in class characteristics with the item A1-1 submitted screwdriver. Item A1-1 was compared to items A1-2 and A1-3. The toolmark evidence in question was made with the suspect tool. The questioned toolmarks were compared to the item A1-1 submitted tool utilizing a Leica model FSC comparison microscope with serial # 274001.
4CDP8Y	Microscopic comparison conducted with the following results: PCL-1 and PCL-2, when compared against each other and SD-1, displayed insufficient individual microscopic markings to permit an identification.
4FK7ZG	1. A number of impact test using the exhibit screwdriver (item 1) were conducted using lead sheets and a test paint tin lid. 2.Comparative microscopic examinations between the test paint lid and the exhibit damaged paint tin lids, (items 2 and 3), revealed that the suspect toolmarks on the exhibit damaged paint tin lids, (items 2 and 3), were produced by the exhibit screwdriver, (item 1).
4G9GFV	The two paint can lids, Items 2 and 3, were stereoscopically examined and a single impressed toolmark was noted on the top surface of both lids. Based on agreement of class characteristics, the toolmarks were microscopically compared to each other and were identified based on individual characteristics as having been made by the same tool. Test impression marks were made utilizing the Item 1 tool. These exemplars revealed similar class characteristics and toolmarks from the tip of the screwdriver that were sufficient for comparison purposes. Based on a microscopic comparison of the test marks to Items 2 and 3, the Item 1 screwdriver was identified as having made the impressed toolmark on the two paint can lids during some point in time.

TABLE 2

WebCode	Conclusions
4HLFN6	Test toolmarks produced by Item #1 were microscopically examined in conjunction with the toolmarks on Items #2 and 3. Based on these comparative examinations, it was determined that the toolmarks on Items #2 and 3 were produced by Item #1.
4JFUJA	Exhibit 001 is a flat bladed screwdriver with a metal shaft and a red and black plastic handle. Test toolmarks were made with the Exhibit 001 screwdriver and designated as 001-T1 and 001-T2. The Exhibit 002 and 003 paint can lids were examined for the presence of toolmarks. Toolmarks of value found were produced by a compression action having a rectangular shape. These marks were microscopically compared to the test marks from Exhibit 001. There is agreement of all discernible class characteristics and sufficient agreement of individual characteristics to identify the Exhibit 001 screwdriver as having made the toolmarks on the Exhibit 002 and 003 paint can lids.
4JGJCT	I have found a match between the mark produced by the suspect's screwdriver (Item 1) and the marks found on both paint can lids (Items 2 and 3). This screwdriver is the tool used for producing these marks.
4NBQ7F	1) Exhibit 1 (Flat tip screwdriver) can be used as a puncture tool although that is not the purpose it was designed for. Exhibit 1.1 (Test Marks) was created and is being returned with Exhibit 1. 2) Damage on Exhibits 2 (Paint Can Lid) and 3 (Paint Can Lid) were visually and microscopically examined and compared to test toolmarks from Exhibit 1 (Screwdriver). a) The Exhibit 1 screwdriver caused the damage on the Exhibits 2 and 3 paint lids.
4P4E86	The two paint can lids marked 251107/14 item 2 and item 3 were struck by the screwdriver marked 251107/14 item 1 - there was a sufficient agreement of class and individual characteristics.
4QGQAF	On 2015-01-06 during the performance of my official duties I received a sealed evidence bag with number PAD000586502 from Case Administration of the Ballistics Section, containing the following exhibits: 3.1 One (1) Flat nose screw driver marked by me "1017/15". 3.2 Two (2) paint can lids marked by me "1017/15 A" and "1017/15 B" respectively. 4. The intention and scope of this forensic examination comprise the following: 4.1 Microscopic individualization of toolmarks. 4.2 Examination of tools and tool mark related materials. 5. I compared the individual and class characteristic markings on the paint can lids mentioned in paragraph 3.2 using the comparison microscope and found: 5.1 The marks on the paint can lids mentioned in paragraph 3.2 were produced by the screw driver mentioned in paragraph 3.1.
4T86HQ	Toolmarks found on Items 2 and 3 were identified as having been produced by Item 1A based on agreement of individual and class characteristics.
634JQ3	The marks on the paint can lids marked 248193/14 (2) and (3) were produced by the screwdriver marked 248193/14(1).
64WDQR	The suspect toolmarks on both of the paint can lids (Items 2 and 3) were produced by the questioned screwdriver (Item 1).

TABLE 2

WebCode	Conclusions
66TEK3	Examination of Items 2 and 3 revealed the presence of impressed toolmarks that had been produced by a flat-bladed tool. Using the screwdriver in Item 1, test toolmarks were produced. These test toolmarks were microscopically examined in conjunction with the toolmarks present on Items 2 and 3. Based on these comparative examinations, it was determined that the screwdriver in Item 1 was used to produce the impressed toolmarks present on Items 2 and 3.
67MYC9	Test marks made with the screwdriver in Item #1 were compared to the tool marks on items #2 and #3 and were found to match. Therefore Item #1 made the tool marks on Items #2 and #3.
6AM4C9	Toolmarks on Items 2 and 3 were identified as having been produced using the Item 1 screwdriver.
6MCZD7	The toolmarks on the paint can lids in items 2 and 3 were identified as having been made by the screwdriver in item 1. The test marks in item 1T will be returned to the contributor.
6UPNU9	The two paint can lids marked 251167/14-item 2 and item 3 were struck by the screwdriver marked 251167/14-item 1. There is sufficient agreement of combination of class and individual characteristics.
7BEWR7	There is sufficient agreement of class and individual characteristics of the marks between the test made from the item1 (screwdriver) and the paint can lids (item 2 and 3) that means the suspect tool was used on both paint can lids.
7EF39X	I compared the individual and class characteristic markings on the screw driver and the lids using a comparison microscope and found: The marks on the lids were produced by the screw driver.
7F9V2V	Microscopic comparison was conducted with the following results: Defect toolmarks noted on paint can lids (item #2 & 3) were produced by submitted screwdriver (item #1)
7GGQFD	The suspect toolmarks on both of the paint can lids (items 2 and 3) were produced by the questioned screwdriver (item 1).
7K6GX6	I compared individual and class characteristics markings on the screwdriver and paint can lids mentioned in 3.1 and 3.2 using the comparison microscope and found: The marks on the paint can lids mentioned in 3.2 were produced by the screwdriver mentioned in 3.1.
7LZ6CT	CONCLUSIONS: THE TOOL MARK IMPRESSION ON PAINT CAN LID ITEM 3 (MARKED WITH RED PAINT) WAS PRODUCED WITH SUSPECTED SCREWDRIVER ITEM 1.
7MPJLP	The impression marks in the items 2 and 3 matches with shape, size and accidental characteristics the screwdriver, Item 1. The marks in the items 2 and 3 are made with the screwdriver, item 1.
7PCEXW	Both of the suspect toolmarks on the paint can lids (item 2 and 3) were produced by the questioned screwdriver (item 1).
7UM9D2	I compared the individual and class characteristic markings on the Repliset casts of the exhibits and tests mentioned in 3.1 and 3.2 using a comparison microscope and found: 7.1 The marks on the exhibits mentioned in 3.2 were produced by the screwdriver mentioned in 3.1.

TABLE 2

WebCode	Conclusions
7WCPBF	Test toolmarks made by using the questioned screwdriver (Item 1) on paint can lid provided. Microscopic examination and comparison revealed that the toolmarks on Item 2 and Item 3 were produced by the questioned screwdriver (Item 1).
7ZWCAV	2.1 The can lid marked item 2 was punctured with the screwdriver marked item 1. 2.2 The can lid marked item 3 was punctured with the screwdriver marked item 1.
87F4UT	Toolmarks were observed on the metal lids of item #'s 2 and 3 that are consistent with being small rectangular impressed marks. The toolmarks on Item #'s 2 and 3 were microscopically compared to test marks produced by the submitted screwdriver (item #1). Upon microscopic examination the following results were obtained: Toolmarks observed on items #'s 2 and 3 were identified as having been produced by item #1.
87GYFK	Microscopic comparisons of the toolmarks observed on the paint can lids from Items #2 and 3 with test toolmarks generated using the screwdriver in Item #1 revealed matching individual characteristics. This finding confirms that the toolmarks from Items #2 and 3 were made by the submitted screwdriver, Item #1.
8AZUHC	3. On 2014-12-10 during the performance of my official duties I received a sealed evidence bag with number PA4002453845 from Case Administration of the Ballistics Section, containing the following exhibits: 3.1 One (1) screwdriver marked by me "252220/14 item 1". 3.2 Two (2) paint can lids marked by "252220/14" each and "item 2" and "item 3" individually. 4. The intention and scope of this forensic examination comprise of the following: 4.1 Examination of tools and toolmark related materials. 4.2 Microscopic individualization of toolmarks. 5. I examined the screwdriver mentioned in paragraph 3.1 and made replications for test purposes, which I marked "item1T1" and "item1T2" respectively. 6. I compared the individual and class characteristic markings on the paint can lids mentioned in paragraph 3.2 and the tests mentioned in paragraph 5 using a comparison microscope and found: 6.1 The marks on the paint can lids mentioned in paragraph 3.2 were produced by the screwdriver mentioned in paragraph 3.1.
8CRDGA	The toolmarks displayed on the Items 2 and 3 paint can lids were identified as having been made by the Item 1 screwdriver, based on the correspondence of individual characteristics.
8PABDX	Item: 1 One screwdriver recovered from suspect. RESULTS: Item 1 was physically and microscopically examined. The tip of Item 1's blade was used to produce test tool marks for microscopic comparison with Items 2 and 3. See Item 2 and 3 results. Item: 1.1- Test tool marks made by the Item 1 screwdriver. RESULTS: Test specimens were separately packaged for return in the container with Items 1, 2, and 3. Item: 2- First paint can lid (marked with blue paint). Item: 3- Second paint can lid (marked with red paint). RESULTS: Items 2 and 3 were physically examined and microscopically compared with each other and with test tool marks made by the Item 1 screwdriver's tip (Item 1.1). Matching individual marks were found and it was concluded that the tool marks on the Item 2 and Item 3 paint can lids were made by the tip of the Item 1 screwdriver.
9HBX22	The screwdriver in item 1 was identified as having made the toolmarks on the paint can lids in items 2 and 3.
9HM8W3	The marks on the paint can lids marked with blue and red paint were produced by the screwdriver recovered from the suspect (item 1).

TABLE 2

WebCode	Conclusions
9HT8QW	Exhibit 1 is a flat-bladed screwdriver with a rectangular-shaped tip. Test toolmarks were produced using the Exhibit 1 screwdriver and were designated as 1-T1 through 1-T4. Exhibits 2 and 3 were microscopically examined for the presence of comparable toolmarks. Rectangular-shaped impressed toolmarks of value were observed on each of the paint can lids. Microscopic comparisons were conducted between the toolmarks observed on Exhibits 2 and 3 and the Exhibit 1 test toolmarks. Based on agreement of all discernible class characteristics and sufficient correspondence of individual characteristics, the Exhibit 1 screwdriver was identified as having produced the toolmarks on the Exhibit 2 and Exhibit 3 paint can lids.
9JZ2BH	[No Conclusions Reported.]
9JZ4ZL	The tool mark observed on Items 2 and 3 were identified as being made by the Item 1 screwdriver.
9REPAP	Results of Examinations: Item 1 is a slotted screwdriver with a ¼ inch blade tip. Item 2 and item 3 contain impressed toolmarks. Toolmarks present on the Item 2 and Item 3 paint can lids were identified as having been produced by the item 1 screwdriver. [Participant included a Methods and Limitations Scale that could not be replicated within the report.]
9X38R8	The suspect toolmarks on both of the paint can lids (items 2 and 3) were produced by the questioned screwdriver (item 1).
9XHVKM	Item 1 is a ¼" x 4" slotted screwdriver of unknown manufacture, Items 2 and 3 are paint can lids, each bearing an impressed toolmark consistent in appearance with having been created by the tip of a slotted screwdriver. The toolmarks present on the item 2 and item 3 paint can lids were identified as having been produced by the item 1 screwdriver.
A6FVML	Tool marks observed on Items T2-MD2-1 and T2-MD2-2 (small metal can lids with impressed marks) are identified to test marks produced using item T2-MD2-c (screw driver).
A8KDVP	Using a comparison scope, microscopic examination and comparison of the submitted screwdriver, Exhibit 1, to the submitted paint can lids, Exhibits 2 and 3, revealed that Exhibit 1 marked Exhibit 2 and Exhibit 3. Punch marks were made on reference can lids submitted with case.
A8PEUB	There was an excellent correspondence of shape and microscopic detail seen between the toolmark in the first paint tin lid (item 2), the toolmark in the second paint tin lid (item 3) and test marks made with the screwdriver recovered from the suspect (item 1). In my opinion, this correspondence means that the screwdriver (item 1) made the toolmarks in both paint tin lids (items 2 and 3).
A9VDWP	As a result of the macroscopic and microscopic comparison it is certain that the questioned toolmarks present on both paint can lids (items 2 and 3) have been produced by the questioned screwdriver (item 1).
AELKH6	Two paints can lids marked Item 2 and Item 3 positive with each other.[sic] Made a two test marked 251117/14 test 1 and test 2 from the screwdriver marked item 1.[sic] Test marked 1 and 2 were positive with exhibit marked item 2 and 3. The individual marks on item 2 and item 3 were produced by the (tool) screwdriver marked item 1.
AMCB2Q	The toolmark impression present on items T2-GY-2 and T2-GY-3 (paint can lids) are identified as having been produced by the flat tip screwdriver: item T2-GY-1.

TABLE 2

WebCode	Conclusions
AMVK2Y	The toolmark on the Item 2 paint can lid was made by the Item 1 screwdriver. The toolmark on the Item 3 paint can lid was made by the Item 1 screwdriver.
AQF4VP	A MICROSCOPIC COMPARISON EXAMINATION OF EVIDENCE TOOL MARKS ON PAINT CAN LIDS ITEM 2 AND ITEM 3 AGAINST TEST TOOLMARKS MADE WITH ITEM 1 SCREWDRIVER HAS REVEALED THAT THE TOOLMARKS ON ITEM 2 AND ITEM 3 WERE MADE WITH ITEM 1 SCREWDRIVER.
AZ33LU	The suspected toolmarks observed on both items #2 and #3 have been produced by the screwdriver, item #1.
AZ3ZYB	CTS Item 1 suspect screwdriver is the tool that was used to make CTS items 2 and 3 evidence tool marks.
B3LCD8	3. On 2014-12-04 during the performance of my official duties I received a sealed evidence bag with number PA4002453855 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) screwdriver with a red and black handle marked by me "247355/14 1". 3.2 Two (2) silver paint can lids marked by me "247355/14" and also "2" and "3" respectively. 4. The intention and scope of this forensic examination comprise the following: 4.1 Microscopic individualization of toolmarks. 4.2 Examination of tools and tool mark related materials. 5. I examined the exhibits mentioned in paragraph 3.2 using a comparison microscope and found microscopic comparable marks which can possibly be utilized for individualization. 6. I examined the exhibit mentioned in paragraph 3.1 and made replications for test purposes marked by me Test 1 and Test 2 respectively. 7. I compared the individual and class characteristic markings on the exhibits mentioned in paragraph 3.2 and the tests mentioned in paragraph 6 using a comparison microscope and found: 7.1 The marks on the exhibits mentioned in paragraph 3.2 were produced by the exhibit mentioned in paragraph 3.1.
B4G2CU	The toolmarks left on the paint can are both punch toolmarks. The general characteristics (class characteristics) correspond to the edge of the recovered screwdriver. Test marks with this screwdriver (Item 1) were created and compared to the toolmarks (Item 2 and Item 3). The analysis and comparison of the specific characteristics (individual characteristics) draw us to the conclusion that the edge of the recovered screwdriver (Item 1) left both toolmarks (Item 2 and Item 3) on the damaged paint cans.
BG26PX	The toolmarks present on items 2 and 3 were made by the submitted screwdriver, item 1.
BHHQD2	The suspect tool marks on both of the paint can lids (items 2 and 3) were produced by the questioned screwdriver (item 1).
BNA93Q	Impression toolmarks on the Items 2 and 3 paint can lids were examined microscopically and identified as having been made with the item 1 screwdriver.
BPYTRV	Item 1 - A screwdriver. Item 2 - A paint can lid bearing a questioned toolmark. Item 3 - A paint can lid bearing a questioned toolmark. Analysis Result: The item 1 screwdriver was examined and test toolmarks were made for comparisons to the toolmarks on items 2 and 3. Sufficient agreements of class and individual characteristics confirmed the toolmarks on items 2 and 3 were both made by the item 1 screwdriver.
BTZ98T	The marks on the paint can lids marked as 247320/14 I2 and I3 were produced by the keystone tip screwdriver marked as 247320/14 I1.

TABLE 2

WebCode	Conclusions
BY769Y	The toolmarks on the lids in Items 2 and 3 were identified as having been created by the screwdriver in item 1.
BYCKGT	One of the two additional paint can lids provided with the exhibits was used to make a test mark with Exhibit 1. The test mark made was designated 1T1. The toolmarks on Exhibit 2 and 3 were microscopically compared to the test mark designated 1T1. There is agreement of all discernible class characteristics and sufficient agreement of individual characteristics to determine that the toolmarks on Exhibit 2 and 3 were made by Exhibit 1.
C4BNHC	It is the opinion of the examiner that the tool mark on Laboratory Item 001.B (Item 2) paint can lid is identified as being made by Laboratory Item 001.A (Item 1) Screwdriver recovered from suspect. For the purposes of this report, the term identification means that there is agreement between a combination of individualizing characteristics as well as all discernible class characteristics. The extent of this agreement exceeds any agreement of characteristics that may be made by different tools, and is consistent with characteristics that were made by the same tool. It is the opinion of the examiner that the tool mark on Laboratory Item 001.C (Item 3) paint can lid is identified as being made by Laboratory Item 001.A (Item 1) Screwdriver recovered from suspect. For the purposes of this report, the term identification means that there is agreement between a combination of individualizing characteristics as well as all discernible class characteristics. The extent of this agreement exceeds any agreement of characteristics that may be made by different tools, and is consistent with characteristics that were made by the same tool.
C6A2GK	Tests from Item 1 and 2 and 3 were compared microscopically with each other. There is agreement of all discernable class characteristics and sufficient agreement of individual characteristics for identification. This screwdriver made the toolmarks on items 2 and 3.
C6UAGU	Test impressions made from Item #1 were microscopically compared to Item # 2 and Item # 3. Item #1 was identified as having made the toolmark impression Item # 2 and Item # 3 due to sufficient correspondence of individual characteristics observed in the toolmark impression.
C8BB48	We conclude that the tool marks on item 2 and item 3 were produced by item 1 for the reasons following: The analogical overall shape and size of tool marks on item 2 and item 3 infer that these marks were made using tools similar in shape. Furthermore, the shape and location of distinguishing protrusions/depression marks on the tip surface of item 1 are recognized on item 2 and item 3, both, as mirror image. In addition, when we compared tool marks produced by item 1 on the extra paint can lid, we could reproduce the characteristics of the tool marks on item 2 and item 3.
C8BDRQ	Defect toolmarks noted on Items #1 & 2 were both produced by Item #3.[sic]
C8CB3M	MICROSCOPIC COMPARISON EXAMINATIONS OF TEST MARKS MADE WITH ITEM 1 SCREWDRIVER AND THE TOOL MARKS ON PAINT CAN LIDS ITEM 2 (BLUE) AND ITEM 3 (RED) REVEALED; THE TOOL MARK ON ITEM 2 (BLUE) PAINT CAN LID COULD NOT BE IDENTIFIED OR ELIMINATED AS HAVING BEEN MADE WITH ITEM 1 SCREWDRIVER DUE TO LACK OF MICROSCOPIC MARKINGS PRESENT ON Q1. Q1 DOES BEAR SIMILAR CLASS CHARACTERISTICS. THE TOOL MARK ON ITEM 3 (RED) PAINT CAN LID WAS MADE WITH K1 SCREWDRIVER.
CCAPRX	The paint can lids marked with the blue and red paint (item 2 and item 3) were produced by the screwdriver (item 1) recovered from the suspect.

TABLE 2

WebCode	Conclusions
CEYGWT	Items 2 and 3 were made by Item 1. These identifications are established by having sufficient surface contours that were in agreement.
CK26EF	Microscopic comparisons of Items #2 and 3 with the test marks made by Item #1 revealed matching individual detail. These findings confirm the submitted screwdriver, Item #1, made the tool mark impressions found on Items #2 and 3.
CNKK28	The toolmarks on the Item 2 and Item 3 paint can lids were caused, within the limits of Practical Certainty* by the Item 1 screwdriver.
CY3GAF	The marks on item 2 and 3 were caused by the screwdriver item 1. Item 2 and 3 were identified within the limits of practical certainty as being by the screwdriver item 1. The stamping traces are matching in every detail.
CYGQV7	Item #2: Test exemplars were obtained from the recovered screwdriver, Item #1, and were compared to the questioned tool mark. Sufficient corresponding individual tool mark signatures were observed to conclude that the tool mark on the paint can lid was made by the screwdriver. Item #3: Test exemplars were obtained from the recovered screwdriver, Item #1, and were compared to the questioned tool mark. Sufficient corresponding individual tool mark signatures were observed to conclude that the tool mark on the paint can lid was made by the screwdriver.
D3LGZZ	The Exhibit 2 and Exhibit 3 impressed marks were microscopically compared to the test impressed marks produced by the Exhibit 1 screwdriver. There is agreement of all discernible class characteristics and sufficient agreement of individual characteristics to determine that the Exhibit 1 screwdriver produced the impressed marks located on the Exhibit 2 and Exhibit 3 metal lids.
D4URRX	Item 1 was used to make the toolmarks observed on Items 2 and 3.
D7VCKH	The characteristic marks on both paint can lids (item 2 and Item 3) were found to match each other and also match with the characteristic marks on the test marks made from the recovered screwdriver (item 1). Hence, I am of the opinion that the toolmarks on item 2 and item 3 were produced by the screwdriver recovered from the suspect (item 1).
DAXX8Z	Test tool marks were made on the submitted additional paint lids using Exhibit 1. The test tool marks were labeled Exhibit 1.TI and were retained with the evidence. The test tool marks (Exhibit 1.T1) were microscopically compared to the tool marks on Exhibits 2 and 3. Based on an agreement of class characteristics and sufficient agreement of individual characteristics, the tool marks on Exhibits 2 and 3 were produced by Exhibit 1.
DBPF8V	The marks on the can lids (item 2 and item 3) were produced by the screwdriver (item 1) received.
DDG8N8	Test impressions were created using the slotted screwdriver, item 1, and microscopically compared to the impressed toolmarks exhibited on the paint can lids, items 2 and 3. Based on agreement of discernible class characteristics and sufficient matching individual detail, the impressed toolmarks exhibited on the paint can lids, items 2 and 3, were identified as having been created by the slotted screwdriver, item 1.
DHQVB3	Examinations showed that the toolmarks Item 2 and Item 3 were made by the Item 1 screwdriver.

TABLE 2

WebCode	Conclusions
DLC83Z	I compared individual and class characteristics markings on the screwdriver and paint can lids mentioned in 3.1 and 3.2 using the comparison microscope and found: The marks on the paint can lids mentioned in 3.2 were produced by the screwdriver mentioned in 3.1.
E7WWYQ	The screwdriver, Item 1, was identified as the source of the tool marks observed on the two paint can lids, Items 2 and 3.
E9KMR9	Item 1 was identified as having produced the toolmarks present on items 2 and 3 based on the sufficient agreement of class and individual characteristics. Lab generated evidence (casts and test toolmarks produced by item 1) were retained with item 001.
EBL9ME	There are sufficient individual markings present to identify item 1 (screwdriver) as the tool used to damage items 2 and 3 (paint can lids).
EENEDY	The tool mark in Item 2 was created by Item 1. The tool mark in Item 3 was created by Item 1.
ENUNV6	The marks on the paint can lids marked item 2 and item 3 mentioned in paragraphs 3.2 and 3.3 respectively were produced by the tool marked item 1 mentioned in paragraph 1.
EQJQMQ	Examinations showed that the impressed tool marks within Item 2 and Item 3 were created by Item 1.
ERVHJE	I conducted a comparative microscopic examination between the impressions (and silicon casts thereof) in the paint tin lids (Items 2 and 3) and test impressions (and silicon casts thereof) made in a similar paint tin lid, using the tip of the screwdriver (Item 1). This revealed that there was a good correspondence of distinctive microscopic features in the impressions which aligned in general shape, contour and spatial orientation to each other. An examination of the screwdriver revealed that the numerous features on the tip appeared to be randomly positioned; I would not expect to see such a close agreement of randomly placed features in the paint tin lids if another screwdriver was responsible for making the impressions in Items 2 and 3. From my examination, I formed the opinion that the tip of the screwdriver was responsible for creating the impressions in both Items 2 and 3.
EXYJMU	Item 1.1 is a red and black handled screwdriver. Items 1.2 and 1.3 consist of two paint can lids with one impressed defect in each lid. They were microscopically compared to the tests from Item 1.1. Item 1.1 was identified as having caused the damage to Items 1.2 and 1.3.
EYH97A	The screwdriver, Item 1, was determined to have produced the marks in both paint can lids, Items 2 and 3.
F9XEKP	Exhibit 1 is an unknown brand, flat head design screwdriver, capable of producing a compression tool action that contains toolmarks of value for comparison. Test impressions were obtained from Exhibit 1 and designated 1-T1 and 1-T2. Exhibits 2 and 3 each have an impression on the exterior side of the paint can lid, produced by a tool employing a compression tool action, which contains toolmarks of value for comparison. Test impressions from exhibit 1 were microscopically compared to Exhibits 2 and 3 with the following results noted: There is agreement of all discernible class characteristics and a sufficient agreement of individual characteristics to identify Exhibit 1 as having produced the impressions on Exhibits 2 and 3.
FAAQ4A	On examination, I found that the toolmarks on both of the paint can lids (Item 2 and Item 3) were produced by the questioned screwdriver (Item 1).

TABLE 2

WebCode	Conclusions
FJWPWZ	Item 1 was used to create the indentations on item 2 and item 3.
FMKMGQ	Tool impressions on Items 2 and 3 were compared microscopically with a Test impression of the submitted screwdriver, Item 1. These comparisons resulted in "Identifications" due to the sufficient quantity and quality of matching individual characteristics in the impressions. Thus, it is the opinion of this Examiner that the impressions on Items 2 and 3 were made by the submitted screwdriver, Item 1.
FTGQZT	The submitted screwdriver (item 1) made the impressed mark on the two submitted paint can lids (items 2 & 3).
FXFAE9	The questioned toolmarks on the paint lids, items 2 and 3, were produced by the screwdriver, item 1.
G7QVZG	Results of Examinations: Item 1 is a flathead screwdriver. The Item 1 screwdriver was identified as having created the toolmarks present on the item 2 and item 3 paint can lids. [Participant included a Methods and Limitations Scale that could not be replicated within the report.]
GCU4ZH	The toolmark on item 2 was produced by the questioned screw driver (identification of item 1). The toolmark on item 3 was produced by the questioned screw driver (identification of item 1).
GDNKJ7	I am of the opinion that: (i). The toolmarks on the first paint can lid 'Item 2' were produced by the screwdriver recovered from suspect (Item 1'). (ii). The toolmarks on the second paint can lid 'Item 3' were produced by the screwdriver recovered from suspect (Item 1').
GHX4HY	Each paint can lid has a single 1/4 inch long, narrow impressed mark. Comparison of each mark with test marks made by the submitted screwdriver reveals sufficient matching microscopic contours to identify that screwdriver #1 made the mark on both lid #2 and lid #3.
GL239C	Item 1 was used to produce the toolmarks on the exhibit paint can lids item 2 and item 3.
GQBTHT	I compared the class and individual characteristic of the tool marks on the paint can lids (marked item 2, item 3) and the test markings produced with the screwdriver (marked item 1) using a comparison microscope and found: The marks on the paint can lids marked items 2 and 3 were produced by the screwdriver marked item 1.
GW4XCW	The screwdriver item 1 produced the marks on the paint can lids item 2 and item 3 with blue and red paint.
GXAKMF	Item 1 is ¼" flat blade screwdriver with red and black handle. Item 2 and Item 3 are paint can lids each containing an impressed toolmark. The toolmarks on the Item 2 and Item 3 paint cans were identified as having been produced by the Item 1 screwdriver. [Participant included a Methods and Limitations Scale that could not be replicated within the report.]
GZHUED	The roughly rectangular impressed marks near the centre of the two metal lids marked "Item 2" and "Item 3" were compared with test marks made using the screwdriver marked "Item 1". Based on agreement of class characteristics and sufficient agreement of individual characteristics, the marks on the metal lids marked "Item 2" and "Item 3" were found to have been made using the screwdriver marked "Item 1".

TABLE 2

WebCode	Conclusions
HA2B2T	I compared the individual and class characteristics markings on the screw driver using a comparison microscope and found that the marks on the two paint can lids (exhibits items 2 and 3) were produced by the screw driver (item 1).
HCPY67	The exhibit screwdriver item 1 will[sic] used to punch the two paint cans marked item 2 and item 3.
HJBV9V	The marks on the paint can lids were produced by the screwdriver.
HLV83C	Test taken from the exhibit screwdriver (Item 1) were compared to the damage on the exhibit paint can lids (Items 2 and 3). My examinations showed that the exhibit screwdriver (item 1) had been used to cause the damage to both of the paint can lids (items 2 and 3).
HLVXXF	Upon microscopic comparison, the damage observed on items 2 and 3 are identified as having been produced by the Red and Black handled (CR-V 1/4 x 4") flat bladed, 8 inch screwdriver (item 1).
JCJ62Q	The marks on the paint can lids mentioned in 3.1.1 were produced by the screwdriver mentioned in 3.1.2.
JFLG7J	Items 1, 1T, 2 and 3 were examined and analyzed using microscopy. Toolmarks present on Items 2 and 3 were identified as having been produced by the Item 1 tool. Four (4) tests produced in laboratory stock material using the item 1 tool are being returned as Item 1T and should be maintained for possible future examinations.
JH8P67	Sufficient agreements of class and individual characteristics confirmed the toolmarks on items 2 and 3 were made by the item 1 screwdriver.
JTPGLN	6.1 The marks on the paint can lids mentioned in 3.2 and 3.3 were produced by the screwdriver mentioned in 3.1.
JVG6BB	The toolmarks present on the two (2) paint can lids in items 2 and 3 were determined to have been made by the screwdriver in item 1.
JVGXVG	Both submitted toolmarks (1-02-AA and 1-03-AA) were identified as having been created by the submitted screwdriver (1-01-AA) due to consistent and repeatable marks.
JZCY9C	It was determined utilizing stereo-microscopic and comparison microscopic examination that the questioned tool mark impressions from item 2 and item 3 were positively made by the item 1 tool.
JZTBPW	In my opinion:- 1) The findings provide conclusive evidence to show that the toolmark on item 3 has been made by the screwdriver item 1. 2) The findings provide conclusive evidence to show that the toolmark on item 2 has been made by the screwdriver item 1.
K2YQKL	The paint can lids in Items 2 and 3 were examined for the presence of toolmarks. The impressed toolmarks present on Items 2 and 3 were microscopically examined in conjunction with test toolmarks produced by Item 1. Based on these comparative examinations and observed class and individual characteristics, it was determined that the toolmarks present on Items 2 and 3 had been produced by Item 1 screwdriver.
K3UN2N	The markings on the paint can lids were produced by the screwdriver.

TABLE 2

WebCode	Conclusions
K3W9X4	There was sufficient agreement of class and individual characteristic markings to determine that the tool marks on the lids, Item 2 and Item 3, had been made by the screwdriver, Item 1.
K7Y89W	In my opinion, the impressions present on items 2 and 3 correspond in size and shape with the test impressions produced by the tip of the screwdriver, Item 1. In addition, there is characteristic detail in each of the considered impressions that corresponds with characteristic detail produced in the test impressions by the submitted screwdriver. I consider the likelihood of obtaining this level of correspondence between the items in question by a result of coincidence, had the submitted screwdriver not made the impressions in question, to be so remote as to be discounted as a practical possibility. It is therefore my opinion that the impressions present on items 2 and 3 have been made by the submitted screwdriver item 1. In my opinion, there is conclusive evidence that the impressions present on items 2 and 3 have been made by the screwdriver item 1.
K9KLLQ	The toolmarks located on the two submitted paint can lids (Items 2 and 3) were examined and microscopically compared to test toolmarks made by the submitted screwdriver (Item 1). Based on these microscopic exams, the toolmarks on both of the paint can lids were identified as having been made by the submitted screwdriver.
KNE9RH	Toolmarks present on items 2 and 3 were microscopically examined and identified as having been produced by item 1. Eight (8) tests produced using Item 1 are being returned as Item 1T and should be maintained for possible future examinations.
KNWWDJ	Toolmarks present on Items 2 and 3 were microscopically examined and identified as having been produced by Item 1. Four (4) tests produced using Item 1 are being returned as Item 1T and should be maintained for possible future examinations.
KP9MMN	Microscopic comparison between the Item 2 and Item 3 toolmarks revealed class and individual characteristic correspondence. It was concluded that the Item 2 and Item 3 toolmarks were made by the same tool. Test toolmarks from the Item 1 tool were microscopically compared to the Item 2 and Item 3 toolmarks, finding class and individual characteristic correspondence. It was concluded that the Item 1 tool made the Item 2 and Item 3 toolmarks.
KW322U	1) Examinations showed the tool mark on Item 2 was made by Item 1. 2) Examinations showed the tool mark on Item 3 was made by Item 1.
L6DXTZ	The characteristics observed in the suspect toolmarks on Items 2 and 3 are reflected in the test marks produced with Item 1. However, due to a lack of knowledge regarding the manufacturing process of Item 1, it cannot be determined with certainty whether the characteristics observed are group characteristics or individual characteristics. Therefore, the conclusion reached is that it is likely that Item 1 produced the suspect marks on Items 2 and 3.
L7TC4G	Struck paint can lid (blue paint) marked 247305/14 2 and struck paint can lid (red paint) marked 247305/14 3 are negative to each other. It cannot be determined if the marks on the struck paint can lids (blue and red) were produced or not produced by the screwdriver marked item 1.

TABLE 2

WebCode	Conclusions
LH7GBC	Results of Examinations: Item 1 is a slotted screwdriver with a ¼ inch blade tip. Item 2 and Item 3 contain impressed toolmarks. Toolmarks present on the Item 2 and Item 3 paint can lids were identified as having been produced by the Item1 screwdriver. [Participant included a Methods and Limitations Scale that could not be replicated within the report.]
LKCYA9	Visual examination of the screwdriver, item 1, failed to reveal the presence of wear and damage to the tip of the screwdriver consistent with use. Examination of the paint can lids, items 2 and 3, revealed toolmark damage consistent with having been made by a flat bladed tool. Microscopic comparisons of the areas of toolmark damage on the paint can lids, items 2 and 3, to the test toolmarks made by the submitted screwdriver, item 1, revealed matching class and individual characteristics. This finding confirms the toolmark damage present on the paint can lids, items 2 and 3, were made by the submitted screwdriver, item 1. Submitted paint can lids were used for test purposes and will be returned with the evidence.
LL38DH	A microscopic comparative examination of item #1 against items #2 and #3 disclosed that the toolmark impressions on items #2 and #3 were made by item #1 (screwdriver).
LNA4XR	Exhibits 2 and 3 each contains an impression produced by a bladed type tool with class characteristics similar to those contained in Exhibit 1, and bear toolmarks of value for comparison. Microscopic comparisons were conducted between the Exhibit 2 and 3 impressions and a test specimen taken of Exhibit 1. These comparisons identified Exhibit 1 as having produced the impressions contained in Exhibits 2 and 3 based on the agreement of all discernible class characteristics and the sufficient correspondence of individual characteristics.
LNU2C8	Microscopic examination and comparison disclosed that the paint can lids of items #2 and #3 were marked by the screwdriver of item #1.
LRQTHJ	Toolmarks on item 2 and item 3 were made with the screwdriver item 1.
LV8BHF	Conclusion: Microscopic comparison was conducted with the following results: Tool marks on L2 and L3 were produced by screwdriver S-1.
LXFNJ9	I conducted a microscopic examination of a toolmark produced using Item 1 (screwdriver) with the toolmarks presented as Items 2 (tin lid blue paint) & 3 (tin lid red paint). There was agreement of all discernable class characteristics and multiple regions displaying matching individual impressed features on both Items 2 & 3 when compared to Item 1. Items 2 & 3 are positively identified as a match to the toolmark created using Item 1 and in my opinion Item 1 (screwdriver) produced the toolmarks evident on both Items 2 & 3.
MAALLX	Tool Mark Analysis: Test marks were made with Item 1, the screwdriver, using submitted testing media. Item 1A, the test marks, were sealed in a manila envelope and will be retained in the laboratory for possible future analysis. Methodology - Comparison Microscopy: The tool marks on Items 2 and 3, the paint can lids, were made with Item 1, the screwdriver, based upon corresponding class and individual microscopic characteristics.
MCBZEC	7. I compared the individual and class characteristic markings in the punch marks found on the can lids as mentioned in 3.1.2 and 3.1.3 and the test marks I made as mentioned in paragraph 6 using a comparison microscope and found: 7.1 The marks in the exhibit lids marked "247266/14 2 and 247266/14 3" were produced by the screwdriver marked "247266/14 1".

TABLE 2

WebCode	Conclusions
MG66MM	I compared the individual and class characteristic markings on the screw driver mentioned in paragraph 3.1 using a comparison microscope and found the marked[sic] on the paint can lids mentioned in paragraphs 3.2 and 3.3 were produced by the screw driver mentioned in paragraph 3.1.
MJUC8K	The marks on the paint can lids marked Item 2 and Item 3 were produced by the screwdriver marked item 1.
MN6MYE	[No Conclusions Reported.]
MPXAYW	3. On 2014-12-15 during the performance of my official duties I received a sealed evidence bag with number PA4002453846 from Case Administration of the Ballistic Section, containing the following item: 3.1 One (1) sealed white cardboard box, marked "2014 CTS Forensic Testing Program Test No. 14-529: Toolmarks Examination Sample Pack: T2", containing the following exhibits: 3.1.1 One (1) red and black flat screwdriver marked "item 1". 3.1.2 Two (2) paint can lids marked "item 2" and "item 3" respectively. 4 The intention and scope of this forensic examination comprise the following: 4.1 Microscopic individualization of tools and toolmarks. 5. I examined the screwdriver mentioned in paragraph 3.1.1 and made replications for test purposes and marked them "212T1" and "212T2" respectively. 6. I compared the individual and class characteristic markings on the paint can lids mentioned in paragraph 3.1.2 with the tests mentioned in Paragraph 5 using comparison microscope and found: 6.1 The marks on the paint can lid marked "item 2" were produced by the screwdriver mentioned in paragraph 3.1.1. 6.2 The marks on the paint can lid marked "item 3" were not produced by the screwdriver mentioned in paragraph 3.1.1.[sic]
MRKVPY	At the first stage of analysis, visual and microscopic examinations have been conducted on the existing suspect toolmarks of the submitted can lids and on the questioned screwdriver. During these examinations, almost in the center of the surface of the can lids, longitudinal shape of the static toolmarks have been identified, which resemble to the questioned screwdriver's blade. Little experiment was conducted in order to identify if the suspect toolmarks on either or both of the paint can lids (Items 2 and 3) were produced by the questioned screwdriver, test marks have been produced on the similar can lids in different angles with different force and direction. Those toolmarks produced during the experiment have been compared to the suspect toolmarks produced on the submitted Item 2 and Item 3 using Comparison Microscope "LEICA DFC 495". During the comparison analysis, details of the toolmarks matched one to another, namely in size, shape, marks' inter-locations and micro relief, which enables us to conclude that the suspect toolmarks on submitted Items 2 and 3 were produced by the questioned screwdriver.
MUD6WZ	The toolmark impressions on the two paint can lids, Items 2 & 3 were produced by the submitted screwdriver, Item 1.
MVBD6J	Test marks were made with Exhibit 1 and were microscopically compared with the toolmarks on Exhibits 2 and 3. Based on similar class characteristics and sufficient correspondence of individual characteristics, the Exhibit 1 screwdriver was identified as the tool that made the toolmarks on Exhibits 2 and 3.
MWHAGV	The toolmarks on the paint can lids labeled as Item 2 and Item 3 were produced by the questioned screwdriver labeled as Item 1.

TABLE 2

WebCode	Conclusions
NC9P27	Test tool marks were produced with Item 1 (screwdriver) on the paint can lids provided for testing purposes. These tests and the suspect tool marks on Items 2 and 3 (evidence paint can lids) were casted using Accutrans casting material. The casts were used for microscopic identification purposes. After microscopic comparison it was determined that the tool marks on Items 2 and 3 (evidence paint can lids) were produced by Item 1(screwdriver).
NF7DA2	A testmark was made using the submitted screwdriver (Item # 1) and compared microscopically against the impressed marks which appear on the submitted can lids (Items # 2 and 3). The examination indicates that both lid impressions (Items # 2 and 3) were made by the submitted screwdriver (Item # 1).
NF8D9F	The item 1 screwdriver is identified with practical certainty as having created the tool marks on the item 2 and 3 paint can lids.
NGY9T4	Results: Class characteristics and individual characteristics were observed to be in agreement between the screwdriver, Exhibit 1, and the toolmarks on the paint can lids, Exhibits 2 and 3. Conclusions: There are toolmarks on the paint can lids, Exhibits 2 and 3, that were produced with the screwdriver, Exhibit 1.
NHEU2X	The results of the examination extremely strongly support that the toolmarks in Item 2 and Iten[sic] 3 were made by Item 1 (Level +4).
NK3Y4P	After I compared the individual and class characteristic markings on the screwdriver marked item 1 and on the paint can lids marked item 2 and item 3 using a comparison microscope I found that the paint can lids were produced by the screwdriver marked item 1.
NQAD49	Test marks were made on additional paint can lids, using the screwdriver, item 1. The test marks were microscopically examined and compared to the toolmarks on items 2 & 3. It was determined that the toolmarks on items 2 & 3 were made by the screwdriver, Item 1.
NVLE9C	The can lids marked 247289/14 item 1, 2 and tests 1,2 are inconclusive due to insufficient marks.
NWGKHW	Tool Marks Analysis: Methodology - Comparison Microscopy: Test marks were made with Item 1, the screwdriver, using laboratory testing media. Item 1A, the test marks, were sealed in a manila envelope and will be retained in the laboratory for possible future analysis. The tool mark on Item 2, the paint can lid, was made with Item 1, the screwdriver, based upon corresponding class and individual microscopic characteristics. The tool mark on Item 3, the paint can lid, was made with Item 1, the screwdriver, based upon corresponding class and individual microscopic characteristics.
NXRAZM	Standards were made using the CR-V ¼ X 4 inch screwdriver marked #1 and compared to the striations and impressions appearing upon the two paint can lids marked #2 and #3 with positive results. The striations and impressions appearing upon the two paint can lids marked #2 and #3 were caused by the blade of the CR-V ¼ X 4 inch screwdriver marked #1.
PAHMCP	Examinations showed that the toolmarks present on Item 2 and Item 3 (paint can lids) were made by Item 1 (screwdriver).

TABLE 2

WebCode	Conclusions
PK2RUM	Exhibit 1 is an unknown brand, slotted screwdriver. Exhibit 2 is a silver colored, 2 ½" diameter paint can lid with a ¼" impressed toolmark. Exhibit 3 is a silver colored, 2 ½" diameter paint can lid with a ¼" impressed toolmark. The toolmarks on Exhibits 2 and 3 were microscopically compared to each other. Based on an agreement of class characteristics and sufficient agreement of individual characteristics, Exhibits 2 and 3 were produced using the same tool. Test toolmarks were made using the screwdriver (Exhibit 1) and the provided exemplar lids. The test toolmarks were retained with the evidence as Exhibit 1.T1. A test toolmark from Exhibit 1.T1 was microscopically compared to Exhibit 3. Based on an agreement of class characteristics and sufficient agreement of individual characteristics, Exhibits 2 and 3 were produced using Exhibit 1.
PMKNWZ	There is a total coincidence of characteristics of classes and individualistics between the tool marks (item 1) and the first can lid (item 2).
PPUY6H	Microscopic examination and comparison of test toolmarks produced using the screwdriver in Item 1 and the toolmarks on Items 2 and 3 revealed that the toolmarks on Items 2 and 3 had both been produced by the screwdriver in Item 1.
PQPJVN	1) The screwdriver (Exhibit 1) made the tool marks on the two metal lids (Exhibit 2 and 3).
PVDR8P	The screwdriver marked item 1 was marked by me with a lab number 251119/14(1). The tin lid paint item 2 (blue paint) was marked as 251119/14(2) and the lid tin paint item 3 (red paint) was marked 251119/14(3). The two tin lids paint, one was unmarked and the other one was used as test purpose and marked as 251119/14 Test 1. Conclusion: both exhibits showed that their toolmarks were produced by the same tool and also produced by the received exhibit marked item 1 (screwdriver).
PXMNUE	[No Conclusions Reported.]
Q7ELW8	The toolmark on can lid marked blue and red were both compared to each other and to test marks made by the submitted screw driver.
QADK3B	The impressed mark made on each paint can lid (2, 3) was produced by the screwdriver (1).
QBPPPV	The evidence tool mark impressions on items 2 and 3 paint can lids were made by the item 1 screwdriver.
QF3CJZ	The impressed toolmarks on the paint can lids, Exhibits 2 and 3, were neither identified nor eliminated as having been produced with the screwdriver, Exhibit 1.
QH8Z3V	Test toolmarks produced with the screwdriver (item #1) in the supplied paint can lid (item #4) were compared microscopically with the questioned toolmarks on the evidence paint can lids (items # 2 & 3) with positive results. It is the conclusion of this examiner that the toolmarks on the paint can lids (items #2 & 3) were produced using the screwdriver (item #1).
QKTCQK	The toolmark impressions in Items 2 and 3 were found upon microscopic comparison to have been made by the flat head tip of the screwdriver in Item 1.
QNY6XK	The marks on the paint can lids marked 10669/15 B - C with blue and red colour respectively were produced by the one screwdriver marked 10669/15 A.
QP6PLL	The tool marks on items 2 and 3 were produced by the screwdriver in question.

TABLE 2

WebCode	Conclusions
QQZYMV	Methodology - Comparison Microscopy. Test marks were made with item 1, the screwdriver, using submitted testing media (lids). The tool mark on Item 2, the lid, was made with Item 1, the screwdriver, based upon corresponding class and individual microscopic characteristics. The tool mark on item 3, the lid, was made with Item 1, the screwdriver, based upon corresponding class and individual microscopic characteristics.
QRBBAL	The marks on paint can lids were produced by the screwdriver received.
QZNP9M	Exhibit #1 is a flat-blade slotted screwdriver, brand name CR-V. Tests impression toolmarks of the flat end of the blade were made using two (2) additional supplied paint can lids and designated as 1T1. Exhibit #2 is a metal paint can lid containing one impressed toolmark. Exhibit #3 is a metal paint can lid containing one impressed toolmark. Microscopic comparisons between the Exhibit #1 test toolmarks and the toolmarks on Exhibit #2 and #3 evidence lids revealed the following: Based on sufficient agreement of individual characteristics, it was concluded that the toolmarks on Exhibits #2 and #3 were produced by the Exhibit #1 screwdriver.
RLLVHT	Using the Microscope and Comparison Microscope, Inspection result are below. Item 2 and Item 3 are same each other.[sic] There's toolmarks are same size and matched characteristic pattern.[sic] In this lab we imprinted on the lids using Item 1 that is test mark. We made a comparison between test mark and Item 2, Item 3. Test mark is same with Item 2 and Item 3. So Item 2 and Item 3 were imprinted using Item 1.
RLLX7C	There were insufficient corresponding microscopic markings present to call a identification of item #2 & Item #3 when compared against each other, however item #2 & item #3 did show some vague gross marks when compared against the screwdriver (item #1)
RNAR4J	Toolmarks noted on Items 2 and 3 were produced by Item 1.
T4JT3Z	The toolmarks left on the item 2 and Item 3 paint can lids were made by the item 1 screwdriver.
TALTC3	Item #1 is consistent with a flat head screwdriver, with a black and red in color handel[sic] unknown brand, model consistent with CR-V 1/4 X 4 ". Items #2 and #3 consist of two (2) paint can lids which were identified as having been punched by the item #1 screwdriver.
TD47V6	There was a very highly significant degree of correspondence between test impressions made using the screwdriver item 1 and the damage on both of the lids in items 1[sic] and 2. There is no doubt that the damage on both lids in items 1[sic] and 2 was made by the screwdriver item 1.
TGLRYQ	1. Examination of Exhibit 1 (screwdriver) disclosed that it is a slotted screwdriver of undetermined brand. Test standards were created for comparison purposes and are being returned for accountability purposes. 2. Exhibits 2 and 3 (two paint can lids) were visually examined and microscopically compared to test standards from Exhibit 1 (screwdriver). a. Examination of Exhibits 2 and 3 disclosed an impression near the center of each lid consistent with being made by a flat-bladed tool, such as a screwdriver or similar type tool. b. Microscopic comparison disclosed that the questioned toolmarks on Exhibits 2 and 3 were produced by Exhibit 1.

TABLE 2

WebCode	Conclusions
THGGYD	Test toolmarks from the flathead screwdriver 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 the toolmarks on Items 2 and 3 had been produced by the flathead screwdriver in Item 1.
TMURZ3	Toolmarks present on Item 2 and 3 were made by Item 1
TWXCEA	The screwdriver from Item #1 was examined and tests were made into the submitted exemplar material. These tests were microscopically compared to the strike marks on the paint can lids, Items #2 and #3. The strike mark area on both of the paint can lids, Items #2 and #3 were identified as having been made by the screwdriver, Item #1.
UGZMVH	Item 1 is a standard screwdriver approximately 7 7/8 inches in length with a blade approximately 1/4 of an inch wide. Items 2 and 3 are paint can lids with apparent impressed tool marks. Using Item 1, test tool marks were made on the additional paint can lids then microscopically compared to the submitted items with the following results: - The tool marks on Item 2 and Item 3 were identified as having been made by the submitted screwdriver (Item 1).
UKHC9M	3. On 2014-12-10 during the performance of my official duties I received a sealed evidence bag with number PA4002453848 from Case Administration Section, containing the following exhibits: 3.1 One (1) screwdriver marked by me "251820/14 item 1". 3.2 One (1) paint can lid marked by me "251820/14 item 2". 3.3 One (1) paint can lid marked by me "251820/14 item 3". 3.3 Two (2) paint can lids for possible test mark purposes. 4 The intention and scope of the forensic examination comprise the following: 4.1 Examination of tools and toolmark related materials. 4.2 Microscopic individualization of toolmarks. 5. I examined the paint can lids mentioned in paragraphs 3.2 and 3.3 respectively, and made the marks on paint can lids mentioned in paragraph 3.3 and marked them 820T1 and 820T2, by using the tool mentioned in paragraph 3.1. 6. I compared the individual and class characteristics markings on the paint can lids and tests mentioned in paragraphs 3.2, 3.3 and 5 using a comparison microscope and found: 6.1 The marks on the paint can lids mentioned in paragraphs 3.2 and 3.3 respectively, were produced by the tool mentioned in paragraph 3.1.
UUPRFV	On the analysis and examination, I found that the marks on the[sic] both can lid which are Item 2 and Item 3 recovered were similar to the marks produced by the screwdriver recovered from the suspect. Hence, I am of the opinion that marks on Item 2 and Item 3 could have been made by the suspect.
UUPU6Y	The dimages[sic] found in the paint can lid, item 2, and the paint can lid, item 3, were caused by the screwdriver, item 1.
UZVK86	A microscopic examination and comparison of test produced marks using Item #1, the submitted screwdriver, to items #2 and 3, two submitted paint can lids both exhibiting impact/strike marks, revealed both paint can lids were struck by Item #1, the submitted screwdriver.
V27CN7	Toolmarks present on items 2 and 3 microscopically examined and identified as having been produced by item 1. Two (2) tests produced using Item 1 are being returned as Item 1T in container 1 and should be maintained for possible future examinations.

TABLE 2

WebCode	Conclusions
V27EDB	Examinations showed the suspect toolmarks on both paint can lids of Items 2 and 3 were produced from the screwdriver in item 1.
V6JR2X	There are toolmarks on the paint can lids, Exhibit 2 & 3, that were produced by the screwdriver, Exhibit 1.
V8BK39	Comparative examinations of toolmarks present on Items 2 and 3 (two paint can lids) against test toolmarks made with item 1 (screwdriver) showed the presence of matching features. This means that the toolmarks present on Items 2 and 3 were made with Item 1.
VEWY3E	The toolmarks on items 2 and 3 were made by the tool in Item 1.
VGD762	The indentation damage on the lids in Item #2 and Item #3 was caused by the tip of the screwdriver listed in Item #1.
VGWGUE	The questioned toolmarks on Items #2 and 3 (paint can lids) were positively identified as having been produced by Item #1 (screwdriver).
VHBLTC	Item 1 was physically and microscopically examined. Test tool marks were made using the Item 1 screwdriver. Items 2 and 3 were physically and microscopically examined and microscopically compared with each other and with test tool marks made by Item 1. Even though a high degree of similarity was noted in the tool marks, results of comparisons were inconclusive due to the unknown method of manufacture of Item 1 and the possibility of subclass characteristics. The tool marks on Items 2 and/or 3 could have been made by Item 1 or by another similar screwdriver(s).
VN2NMJ	I examined the screwdriver mentioned in 3.1.1 and pinned or punched the paint can lids with the screwdriver for test purposes. I compared the individual and class characteristics markings on the paint can lids mentioned in 3.1.2 and 3.1.3 using a comparison microscope and found: The marks on the paint can lids mentioned in 3.1.2 and 3.1.3 were produced by the screwdriver mentione[sic] in 3.1.1.
VULLDR	1. Shape, compression and the striation pattern of the toolmarks on the Item 2 paint can is similar to the shape and pattern of the toolmarks produced by Item 1 screwdriver. 2. Shape, compression and the striation pattern of the toolmarks on the Item 3 paint can is similar to the shape and pattern of the toolmarks produced by Item 1 screwdriver.
VUNYRR	In the opinion of the examiner Laboratory Item 001.B (item 2) toolmark on paint can lid marked with blue paint is identified as being made by Laboratory Item 001.A (item 1) screwdriver. In the opinion of the examiner Laboratory Item 001.C (item 3) toolmark on paint can lid marked with red paint is identified as being made by Laboratory Item 001.A (item 1) screwdriver. For the purposes of this report, the term identification means that there is agreement of a combination of individual characteristics and all discernible class characteristics where the extent of agreement exceeds that which can occur in the comparison of toolmarks made by different tools and is consistent with the agreement demonstrated by toolmarks known to have been produced by the same tool.
WGT6WA	Test marks obtained from item #1 were microscopically compared to the tool mark impressions on item #2 and item #3. Item #1 was identified as having damaged items 2 & 3 based upon a significant agreement of individual characteristics.

TABLE 2

WebCode	Conclusions
WRC3LA	I compared the individual and class characteristics markings on the paint can lids and screwdriver mentioned in 31 and 32 using a comparison microscope and found: The marks on the paint can lids mentioned in 3.2 were produced by the screwdriver mentioned in 3.1
WXHR8N	The impressed toolmarks on the items 2 and item 3 paint can lids were made by the item 1 screwdriver.
X38NAJ	3. On 2014-12-10 during the performance of my official duties I received a sealed evidence bag with number PA4002453847 from Case Administration of the Ballistics Section containing the following exhibits: 3.1 One (1) screwdriver marked by me "251810/14 item 1". 3.2 One (1) paint can lid, marked with blue paint, marked by me "251810/14 item 2". 3.3 One (1) paint can lid, marked with red paint, marked by me "251810/14 item 3". 4. The intention and scope of this forensic examination comprise the following: 4.1 Examination of tools and toolmarks related materials. 4.2 Microscopic individualization of toolmarks. 5. I examined the screwdriver mentioned in paragraph 3.1 and made replications for test purposes which were marked "item 1T1" and "item 1T2". 6. I compared the individual and class characteristics markings [sic] paint can lids mentioned in paragraphs 3.2 and 3.3 as well as the tests mentioned in paragraph 5 and found: 6.1 The marks on the paint lids mentioned in paragraphs 3.2 and 3.3 were produced by the screwdriver mentioned in paragraph 3.1.
XA9E23	The slotted screwdriver (item 01-01) produced the toolmarks on both of the paint can lids (item 01-02 and 01-03).
XG8TTV	As a result of comparing the damage present in both items 2 and 3 with test impressions it was determined that the damage present had been caused by the blade of the screwdriver (item 1) in both items 2 and 3.
XK6G4B	Test toolmarks produced by Item 1 were microscopically examined in conjunction with Items 2 and 3. Based on these comparative examinations, it was determined that the toolmarks on Items 2 and 3 had been made by the screwdriver in Item 1.
XMFX8V	Toolmarks present on the item #2 and #3 paint can lids were identified as having been produced by the item #1 screwdriver.
XN8RA7	Findings: (The findings below are based upon standard firearms identification and examination procedures). Examination of the two (2) paint can lids, Items 1[sic] and 2 revealed the presence of an impressed tool mark approximately centered on each of the submitted paint can lids. Microscopic comparisons of these marks with each other and with test marks made with the submitted screwdriver, item 1, revealed corresponding tip widths and matching individual impressed characteristics. One (1) of the two (2) paint can lids, submitted with #1, was used for test purposes and will be returned with the evidence. Opinions: The tool marks found on the two (2) paint can lids, item 1[sic] and 2, were made by the screwdriver, item 1.
YK6WXM	The screwdriver (Item 1) was examined. The paint can lids (Item 2 and Item 3) were examined. One impressed mark on each lid was observed. The screwdriver was used to make test marks in lead. The test marks were microscopically compared to the two impressed marks. The impressed marks (Item 2 and Item 3) on the paint can lids were made by the screwdriver (Item 1).

TABLE 2

WebCode	Conclusions
YPF8C7	Tools, like the submitted screwdriver (e.g. frontface), 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 shows 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 and item 3 were caused by the screwdriver item 1.
YRNELQ	The toolmark characteristics of Item 2 and Item 3 are similar to toolmark characteristics produced by Item 1. Therefore, the toolmark characteristics on Item 2 and Item 3 could be originated from Item 1.
YVK6KA	I compared the individual and class characteristic markings on the exhibit and tests casts using a comparison microscope and found: The marks on the paint can lids (marked 248222/14 '2' and '3') were produced by the screwdriver (marked 248222/14 '1').
YZX4W4	"Microscopic comparison was conducted with the following results"- Item #2 and Item #3 were produced by Item #1
ZECY36	The Impressed toolmarks observed on the paint can lids (Items 2 & 3) were created by the screwdriver (Item 1), good matching individual characteristics.
ZPEGD8	Item 1: One screwdriver described as “recovered from suspect”. RESULTS: Item 1 was physically and microscopically examined. Item 1.1: Test specimens produced by the Item 1 screwdriver. RESULTS: Test specimens will be stored with the Item 1 screwdriver. Item 2: One paint can lid with toolmark described as “marked with blue paint”. Item 3: One paint can lid with toolmark described as “marked with red paint”. RESULTS: Items 2 and 3 were physically examined. The toolmarks were microscopically compared with each other and with test toolmarks produced by the Item 1 screwdriver. Matching individual identifying characteristics were found, and it was concluded that both the Item 2 and 3 toolmarks were produced by the Item 1 screwdriver.
ZUN66B	3. On 2015-01-16 during the performance of my official duties I received a sealed evidence bag with number PA4002447386 from Case Administration of the Ballistics Section, containing the following: 3.1. One (1) Unknown manufactured screwdriver, marked by me "11699/15 Item 1". 3.2 Two (2) paint can lids marked by me "11699/15" each and "Item 2" and "Item 3" respectively. 4. The intention and scope of this forensic examination comprise of the following: 4.1 The examination of tools and tool mark related materials. 4.2 Microscopic individualization of toolmarks. 5. I examined the paint can lids mentioned in paragraphs 3.2 using a comparison microscope and found microscopic comparable marks which can possibly be utilized for individualization. 5.1 I examined the paint lids mentioned in paragraph 3.2 and made replications for test purposes which I marked 11699/15 T1 and 11699/15 T2 respectively. 6. I compared the individual and class characteristics markings on the paint lids mentioned in paragraph 3.2 with the replications mentioned in paragraph 5.1 using a comparison microscope and found: 6.1 The marks on the paint lids mentioned in paragraph 3.2 were produced by the screwdriver mentioned in paragraph 3.1.
ZUURRB	Test toolmarks made using the tip of the submitted screwdriver (Item 1) were microscopically compared to the impressed toolmarks present on the lids of the submitted paint cans (Items 2 and 3). Based on these comparisons, the screwdriver was identified as having made the impressions on both of the paint can lids.

TABLE 2

WebCode	Conclusions
ZW3XDC	Exhibits 2 and 3 are silver colored paint can lids approximately 2 1/2" in diameter with an impressed toolmark in the center of each one. The impressed marks in Exhibits 2 and 3 were microscopically compared against each other. Based on agreement of class and sufficient agreement of individual characteristics, the marks were made with the same tool. Exhibit 1 was used to make test impression marks in a supplied paint can lid. The lid was retained and marked "I.TM1". A microscopic comparison was made of the test impressions against Exhibits 2 and 3. Based on agreement of class and sufficient agreement of individual characteristics, the impressions in Exhibits 2 and 3 were made using the tip of Exhibit 1.
ZZX6H2	The macroscopic examination reveal that the toolmark on the two paint can lids made by tool like screwdriver has the same size edge. The comparative microscopic examination between the tool mark on the two paint can lids submitted in item no. 2 and item no. 3 reveal that they has[sic] the same marking and one screwdriver used in making the suspect toolmarks. The comparative microscopic examination between the toolmarks on the two can lids recovered and the toolmark tested from screwdriver submitted in item no. 1 reveal that the screwdriver submitted used in making the tool marks on the two paint can lids submitted.

Additional Comments

TABLE 3

WebCode	Additional Comments
38L3WY	Strength of Associations Made in the Identification of Toolmarks: Identifications of toolmarks with a specific tool are made to the practical, not absolute, exclusion of all other tools. This is because it is not possible to examine all tools in the world, a prerequisite for absolute certainty. The conclusion that sufficient agreement for identification exists between two toolmarks means that the likelihood another firearm or tool could have made the questioned mark is so remote as to be considered a practical impossibility.
43PYY7	The Item 3 toolmark was identified to the Item 1 screwdriver using the T1 test toolmark. The item 2 toolmark could not be identified to the item 1 screwdriver using either the T1 or T2 test toolmark. However, upon further inspection, the T2 toolmark could be identified to the T3 toolmark, which was made by the item 1 screwdriver. Therefore, the item 2 toolmark was made by the item 1 screwdriver.
4CDP8Y	SD-1 = Screwdriver 1, PCL 1 = Paint can lid 1, PCL 2 = Paint can lid 2
4G9GFV	The above items, along with the Item 1.1 test toolmarks, will be returned to the submitting agency.
4P4E86	Tool marks are scratches or impressions that are left on an object that is softer than the object or tool that caused the marks. Harder objects (screw driver) leaves markings on the surface of the paint can lid (softer object) is an example of a toolmark. The unique and individual imperfections on the tool surfaces that are transferred to the softer surface of the damaged object was used to make a positive identification.
6UPNU9	There is sufficient agreement of microscopic marks for identification.
7LZ6CT	THE TOOL MARK IMPRESSION ON PAINT CAN LID ITEM #2 (MARKED WITH BLUE PAINT), CANNOT BE IDENTIFIED OR ELIMINATED AS BEING PRODUCED WITH SUSPECTED SCREWDRIVER ITEM #1,DUE TO THE LACK OF SUFFICIENT INDIVIDUAL CHARACTERISTIC MARKINGS ON PAINT CAN LID ITEM #2.
7UM9D2	I examined the screwdriver mentioned in 3.1 and made replications marked 248182/14 T1 and 248182/14 T2 for test purposes. 5.1 I made Repliset casts of the marks produced for comparison purposes. 6. I examined the paint can lids mentioned in 3.2 and found: 6.1 The exhibits were damaged by a screwdriver or similar type tool. 6.2 I made Repliset casts of the marks for comparison purposes.
7ZWCAV	Due to the poor reproducibility of the thin can metal, Repliset cast were made of the exhibit puncture marks and tests puncture marks and compared.
A8KDVP	Three punch marks in all were made, two one on lid.[sic]
A9VDWP	The toolmarks for comparison have been produced in our lab using the screwdriver item 1 and both lead and the test material provided (can lids). The toolmarks produced with the known tool item 1 and the questioned toolmarks (items 2 and 3) have been moulded using a suitable moulding material (AccuTrans). The comparison has been performed with a comparative macrosope[sic]. The method "Toolmarks examination" is accreditated[sic] according to ISO 17025.

TABLE 3

WebCode	Additional Comments
C6A2GK	I think the tool should have had some wear on it rather than just the build up of finish material at the edges. Also the manufacturing marks on the paint can lids came through even with casting because they were quite prominent. I had to use a lot of force to get suitable tests in metal for comparison purposes, I think using a worn tool would have made this less problematic.
CNKK28	*Practical Certainty: Since it is not possible to collect and examine samples of all tools, it is not possible to make an identification with absolute certainty. However all scientific research and testing to date and the continuous inability to disprove the principles of toolmark analysis have demonstrated that tools produce unique, identifiable characteristics which allow examiners to reliably make identifications. Firearms/Toolmark Identification is an empirical science that relies on objective observations and a subjective interpretation of microscopic marks of value.
HCPY67	Class and individual characteristics of item 2 and 3 were identified as matching to item 1. Therefore that item 2 and 3 have been punched by same screwdriver marked item 1.
L7TC4G	Screwdriver marked item 1 produced insufficient marks on both the test paint can lids marked 247305/14 T1 & T2.
LV8BHF	(Item #1) one (1) red and black screwdriver approximately 8" in length, commercially marked "CR-V". (Item #2) one (1) paint can lid approximately 2 3/4" in diameter marked with blue paint. Scribed L1 and 14529. Item #3) one (1) paint can lid approximately 2 3/4" in diameter marked with red paint. Scribed L2 and 14529.
NK3Y4P	Screwdriver leaves impression marks as it slides across a softer surface.
NVLE9C	The marks on the exhibits marked 247289/14 item 1,2 and tests 1,2 are not convincing enough to conclude on positive or negative (insufficient marks).
PVDR8P	The screwdriver leaves the same marks that was on the exhibits, (item 2 and item 3), it showed the same characteristic and individual comparable marks of the same type of tool.
QF3CJZ	Agreement of surface contour features can be observed microscopically between the toolmarks on Ex. 2 and 3 when compared to the toolmark created by Ex. 1 (screwdriver). The significance of the agreement of these microscopic features cannot be determined in the absence of information regarding manufacturing techniques used to produce the screwdriver head (specifically, the techniques applied to the tip of the head prior to plating). It is unknown if the microscopic characteristics are individual in nature. Class characteristics of Ex. 1,2 and 3 are in agreement.
RLLX7C	The screwdriver toolmarks were produced in the same direction as the toolmarks producing the marks in both paint can lids (#2 & 3), causing the conclusion to be insufficient and not a positive identification beyond a reasonable degree of scientific certainty.
VHBLTC	Physical and microscopic examination of the tip of the Item 1 screwdriver did not reveal any striated markings indicative of the grinding/sanding process that many manufacturers use to produce a tip that is square with sharp shoulders. The grinding/sanding process imparts individual characteristics that can be used for identification/individualization. The tip was consistent with having gone through the stamping process that flattens the tip and then trims the

TABLE 3

WebCode	Additional Comments
	tip to the rough blade shape. This process could impart subclass characteristics on the tip of the screwdriver that may be found on a number of other screwdrivers. Examination also revealed that the screwdriver appeared to be in new or near new condition and did not bear an appreciable number, if any, nicks or scratches from use/abuse that could be used for identification/individualization.
VN2NMJ	The conclusions arrived at were based on facts established by means of an examination and process which require a knowledge and skill in forensic ballistics.

Appendix

Collaborative Testing Services ~ Forensic Testing Program *****

Test No. 14-529: Toolmarks Examination

DATA MUST BE RECEIVED BY *January 26, 2015* TO BE INCLUDED IN THE REPORT

Participant Code: WebCode:

Accreditation Release Section

CTS submits external proficiency test data directly to ASCLD/LAB and ANSI-ASQ NAB/FQS. 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 and/or ANSI-ASQ NAB/FQS. **(Accreditation Release section on the last page must be completed and submitted.)**

☐ This participant's data is NOT intended for submission to ASCLD/LAB or ANSI-ASQ NAB/FQS.

Online Data Entry

Visit www.cts-portal.com to enter your proficiency test results online. If you have any questions please do not hesitate to contact CTS.

Scenario:

Police are investigating the vandalism of a homeowner's garage. Paint cans were found strewn around the garage leaking paint from holes that appeared to have been punched in the lid. A suspect was apprehended near the garage shortly after the incident occurred and police seized a screwdriver from his possession. During the investigation two paint cans were recovered where the lids had been struck but not punctured. Investigators are submitting the screwdriver along with the two damaged paint can lids for your examination.

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.
-Two additional paint can lids have been included for possible test mark purposes.

Items Submitted (Sample Pack T2):

Item 1: Screwdriver recovered from suspect.

Item 2: First paint can lid (marked with blue paint).

Item 3: Second paint can lid (marked with red paint).

1.) Were the suspect toolmarks on either or both of the paint can lids (Items 2 and 3) produced by the questioned screwdriver (Item 1)?

Item 2	Yes	☐	No	☐	Inconclusive*	☐
Item 3	Yes	☐	No	☐	Inconclusive*	☐

*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.

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

3.) Additional Comments

Return Instructions: Data must be received via online data entry, fax (please include a cover sheet), or mail by *January 26, 2015* to be included in the report.

QUESTIONS?
TEL: +1-571-434-1925 (8 am - 4:30 pm EST)
EMAIL: forensics@cts-interlab.com
www.ctsforensics.com

Participant Code:

ONLINE DATA ENTRY: www.cts-portal.com

FAX: +1-571-434-1937
or Toll-Free: 1-866-FAX-2CTS (329-2287)

MAIL: Collaborative Testing Services, Inc.
P.O. Box 650820
Sterling, VA 20165-0820 USA

Please return all pages of this data sheet.

RELEASE OF DATA TO ACCREDITATION BODIES

The following Accreditation Releases will apply only to:

Participant Code: WebCode:

for Test No. **14-529: Toolmarks Examination**

This release page must be completed and received by ***January 26, 2015*** to have this participant's submitted data included in the reports forwarded to the respective Accreditation Bodies.

ASCLD/LAB RELEASE

If your lab has been accredited by ASCLD/LAB and you are submitting this data as part of their external proficiency test requirements, have the laboratory's designated individual complete the following.
The information below must be completed in its entirety for the results to be submitted to ASCLD/LAB.

ASCLD/LAB Legacy Certificate No. _____ ASCLD/LAB International Certificate No. _____

Signature _____ Date _____

Laboratory Name _____

Location (City/State) _____

ANSI-ASQ NAB/FQS RELEASE

If your laboratory maintains its accreditation through ANSI-ASQ NAB/FQS, please complete the following form in its entirety to have your results forwarded.

ANSI-ASQ NAB/FQS Certificate No. _____

Signature and Title _____ Date _____

Laboratory Name _____

Location (City/State) _____

Accreditation Release

Return Instructions

Please submit the completed Accreditation Release at the same time as your full data sheet. See Data Sheet Return Instructions on the previous page.

Questions? Contact us 8 am-4:30 pm EST
Telephone: +1-571-434-1925
email: forensics@cts-interlab.com

Please return all pages of this data sheet.