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FORENSIC TESTING PROGRAM

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Firearms Examination
Test No. 23-5261 Summary Report

Each sample set consisted of three known expended cartridge cases test-fired from a suspect weapon (Item 1) and four questioned expended cartridge cases (Items 2-5). Participants were requested to examine these items and report their findings. Data were returned from 328 participants and are compiled into the following tables:

Report Contents:

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 five items: Item 1 consisted of three cartridge cases discharged from the suspect's gun. Items 2, 3, 4, and 5 each consisted of one cartridge case recovered from a crime scene. PMC Bronze .40 Smith & Wesson (S&W) 180 Grain FMJ-FP was used for all five items. Participants were requested to determine if any of the recovered questioned cartridge cases (Items 2-5) were discharged from the same firearm as the known cartridge cases (Item 1).

ITEMS 1 AND 5 (IDENTIFICATION): The cartridge cases in Items 1 and 5 were discharged from a CZ 40B (SN: A6172). Multiple magazines were loaded with PMC Bronze ammunition for firing with the CZ 40B handgun. After the ammunition was expended, the cartridge cases were collected and packaged together as a batch. This process was repeated until the required number was produced. Out of each batch, the necessary number of cartridge cases were selected and marked with a "1" (three cartridge cases) and "5" (one cartridge case), then sealed into their respective boxes.

ITEMS 2, 3, AND 4 (ELIMINATION): Items 2, 3, and 4 were discharged from a CZ 75 P-07 (SN: A758963). Multiple magazines were loaded with PMC Bronze ammunition for firing with the CZ 75 P-07 handgun. After the ammunition was expended, the cartridge cases were collected. This process was repeated until the required number was produced. From each batch, the necessary number of cartridge cases was selected and marked with a "2" (one cartridge case), "3" (one cartridge case), and "4" (one cartridge case), then sealed into their respective boxes.

SAMPLE SET ASSEMBLY: For each sample set, the individual Items 1-5 boxes were placed in a pre-labeled sample set box.

VERIFICATION: During test production, 10% of the cartridge cases from each batch were selected and intercompared to confirm that markings were consistent. All predistribution laboratories reported the expected responses.

Summary Comments

This test was designed to allow participants to assess their proficiency in a comparison of expended cartridge cases. Participants were provided with four questioned expended PMC Bronze .40 Smith & Wesson (S&W) 180 Grain FMJ-FP cartridge cases (Items 2, 3, 4, and 5). Participants were requested to compare these with three known expended cartridge cases (Item 1) that were discharged from the suspect's weapon, a CZ 40B (SN: A6172). For each sample set, the Item 5 cartridge case was discharged from the same firearm as the Item 1 known cartridge cases. The Items 2, 3, and 4 cartridge cases were discharged from a second firearm that was different from the Items 1 and 5 cartridge cases. (Refer to Manufacturer's Information for preparation details).

In Table 1 Examination Results, 324 of the 328 responding participants (99%) identified Item 5 and either eliminated or reported inconclusive for Items 2, 3, and 4 as having been discharged from the same gun as the Item 1 cartridge cases. Of the four remaining participants, three identified Item 5 and left no response for Items 2, 3, and 4 but explained in Table 2: Conclusions as not having been discharged from the same gun as the Item 1 cartridge cases, and the last participant identified Items 2, 3, 4, and 5 as having been discharged from the same gun as the Item 1 cartridge cases.

CTS is aware that many labs will not, as a matter of policy, report an elimination without access to the firearm or when class characteristics match. Thus, responses of "Inconclusive" are not indicated as outliers for elimination items.

Examination Results

Were any of the questioned expended cartridge cases (Items 2-5) discharged from the same firearm as the known expended cartridge cases (Item 1)?

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
24UXVT	No	No	No	Yes	4YHX2J	No	No	No	Yes
24ZJXL	No	No	No	Yes	63AMY3	No	No	No	Yes
26PFBY	No	No	No	Yes	643HH6	No	No	No	Yes
28JGLC	Inc	Inc	Inc	Yes	6AWCJC	No	No	No	Yes
2A7388	No	No	No	Yes	6C862J	No	No	No	Yes
2XAEDB	No	No	No	Yes	6CLJ4A	No	No	No	Yes
2XTHLB	No	No	No	Yes	6E393C	No	No	No	Yes
36PAF6	No	No	No	Yes	6GJ4FX	No	No	No	Yes
399UEY	No	No	No	Yes	6LZFCE	No	No	No	Yes
3BCVPD	No	No	No	Yes	6N6BFJ	Yes	Yes	Yes	Yes
3PQ64N	No	No	No	Yes	6NVGN4	No	No	No	Yes
3PVPVB	No	No	No	Yes	6RPQR6	No	No	No	Yes
3YFY7X	No	No	No	Yes	73PVCG	No	No	No	Yes
42CXY2	No	No	No	Yes	78FBNJ	No	No	No	Yes
43XLJV	No	No	No	Yes	78LWL6	Inc	Inc	Inc	Yes
44QG3X	No	No	No	Yes	79977K	No	No	No	Yes
464RGP	No	No	No	Yes	79XWXK	No	No	No	Yes
4B7KYT	No	No	No	Yes	7AHNCN	No	No	No	Yes
4D7GD8	No	No	No	Yes	7ARDZN	No	No	No	Yes
4EVAVX	No	No	No	Yes	7CP79Y	No	No	No	Yes
4HKLZN	No	No	No	Yes	7ELMF9	No	No	No	Yes
4HML8W	No	No	No	Yes	7G7TFW	No	No	No	Yes
4J46L7	No	No	No	Yes	7PVWDT	No	No	No	Yes
4KWLMP	No	No	No	Yes	7R2H6Y	No	No	No	Yes
4KXCZY	No	No	No	Yes	7TT7CF	No	No	No	Yes
4LQG7Q	No	No	No	Yes	7VT79E	No	No	No	Yes
4RZXWL	No	No	No	Yes	7XF633	No	No	No	Yes
4XH42Z	No	No	No	Yes	7ZE2DJ	No	No	No	Yes
4Y2P9J	No	No	No	Yes	8A7QQP	No	No	No	Yes

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
8CTKY7	Inc	Inc	Inc	Yes	AZCTAN	No	No	No	Yes
8EGCQ4	No	No	No	Yes	AZMAUA	No	No	No	Yes
8FB6GF	No	No	No	Yes	B6DYUD	No	No	No	Yes
8J826G	No	No	No	Yes	B7AEJF	No	No	No	Yes
8KW3UG	No	No	No	Yes	BJZKL6	No	No	No	Yes
8LJ73J	No	No	No	Yes	BMJLNL	No	No	No	Yes
8MMWHT	No	No	No	Yes	BMUAFC	No	No	No	Yes
8NGHD6	No	No	No	Yes	BMXP93	No	No	No	Yes
8RVMWD	No	No	No	Yes	BRUQE7	No	No	No	Yes
8UKUGA	No	No	No	Yes	BW7HLY	No	No	No	Yes
97EWCA	No	No	No	Yes	BXFAPE	No	No	No	Yes
98NG6W	No	No	No	Yes	BZY72Z	No	No	No	Yes
9BLPZE	No	No	No	Yes	C2D6TD	No	No	No	Yes
9DRJ8C	No	No	No	Yes	C7JL8H	No	No	No	Yes
9KYCGV	Inc	Inc	Inc	Yes	C9U3J2	No	No	No	Yes
9QU2ED	No	No	No	Yes	CEKVQF	No	No	No	Yes
9RD3WZ				Yes	CETM9P	No	No	No	Yes
9UJQE6	No	No	No	Yes	CK9YKY	No	No	No	Yes
9ZLPFZ	No	No	No	Yes	CMEHPL	No	No	No	Yes
A3FAKC	No	No	No	Yes	CTVLEU				Yes
A4K3WX	No	No	No	Yes	CVGZMH	No	No	No	Yes
A9WJFG	No	No	No	Yes	CWKH6E	No	No	No	Yes
AA6VWJ	No	No	No	Yes	CXEBVR	No	No	No	Yes
AF6ABE	No	No	No	Yes	D4G3WE	No	No	No	Yes
AFJVM3	No	No	No	Yes	DAPV3Q	No	No	No	Yes
AJ2L2Q	No	No	No	Yes	DDE6KX	No	No	No	Yes
AKG9QE	No	No	No	Yes	DPQDHJ	No	No	No	Yes
AKWNTU	No	No	No	Yes	DQ74VE	No	No	No	Yes
ARV4KM	No	No	No	Yes	DR8RK6	No	No	No	Yes
AVDEKD	No	No	No	Yes	DUKA8A	No	No	No	Yes
AVTD84	No	No	No	Yes	E2QQNF	No	No	No	Yes
AWQXHN	No	No	No	Yes	E2RPKA	No	No	No	Yes

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
E8R8VF	No	No	No	Yes	GQLHZU	No	No	No	Yes
E9LYLR	No	No	No	Yes	GQMPBF	No	No	No	Yes
EB4MY8	No	No	No	Yes	GV8JP9	No	No	No	Yes
EPP6M4	No	No	No	Yes	GVXA7M	No	No	No	Yes
EQKJHA	No	No	No	Yes	GYFZJP	No	No	No	Yes
EQXA8K	No	No	No	Yes	H6HYKL	No	No	No	Yes
ER9PLX	No	No	No	Yes	H6WKT3	No	No	No	Yes
ETMUGB	No	No	No	Yes	HDRZQZ	No	No	No	Yes
EU2TLF	No	No	No	Yes	HMDVCF	No	No	No	Yes
EZAA2V	No	No	No	Yes	HYCCMQ	No	No	No	Yes
EZEV3N	No	No	No	Yes	HYCUJ8	No	No	No	Yes
EZXXTW	No	No	No	Yes	J3PKC3	No	No	No	Yes
F4MAXM	No	No	No	Yes	J3PMYL	No	No	No	Yes
F9DDB4	No	No	No	Yes	J68VXK	No	No	No	Yes
FBANNK	No	No	No	Yes	J6UHX9	No	No	No	Yes
FBVZRY	No	No	No	Yes	J7GYEP	No	No	No	Yes
FEMD4M	No	No	No	Yes	JAJRRM	No	No	No	Yes
FGEHQT	No	No	No	Yes	JD2X34	No	No	No	Yes
FJ24DN	No	No	No	Yes	JEWEK7	No	No	No	Yes
FJMFEH	No	No	No	Yes	JGXNDU	No	No	No	Yes
FQGDEK	No	No	No	Yes	JJRWPP	No	No	No	Yes
FR8N7D	No	No	No	Yes	JT4TX3	No	No	No	Yes
FVHP4C	No	No	No	Yes	JUKV9B	No	No	No	Yes
FZ8WA6	No	No	No	Yes	JZQN37	No	No	No	Yes
G22H8M	No	No	No	Yes	JZUGCU	No	No	No	Yes
G2E7P3	No	No	No	Yes	K2Y2K8	No	No	No	Yes
G42PDT	No	No	No	Yes	K3BVZ8	No	No	No	Yes
G4RHPR	No	No	No	Yes	K3ZF2J	No	No	No	Yes
G7P2CY	No	No	No	Yes	K8DQ8F	No	No	No	Yes
G92VAC	No	No	No	Yes	KA3VZM	No	No	No	Yes
GCGTRD	No	No	No	Yes	KCQGMH	No	No	No	Yes
GN9UD9	No	No	No	Yes	KLAQX6	No	No	No	Yes

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
KQ2KQJ	No	No	No	Yes	QDD66Y	No	No	No	Yes
KQU49Y	No	No	No	Yes	QDL24P	No	No	No	Yes
KUAXMB	No	No	No	Yes	QFNT6B	No	No	No	Yes
KYM743	No	No	No	Yes	QHD7WU	No	No	No	Yes
L4CDAV	No	No	No	Yes	QKUAXQ	No	No	No	Yes
LAFGVM	No	No	No	Yes	QRYECB	No	No	No	Yes
LP8QRK	No	No	No	Yes	QTJZER	No	No	No	Yes
LU3KPL	No	No	No	Yes	QYVNC3	No	No	No	Yes
LYVMPF	No	No	No	Yes	R8BCW2	No	No	No	Yes
M3JC64	No	No	No	Yes	RCYZCF	No	No	No	Yes
M6AHJA	No	No	No	Yes	RKH3WN	No	No	No	Yes
M6JMPT	No	No	No	Yes	RRHF2Y				Yes
MFXLFU	No	No	No	Yes	RT6Q6Q	No	No	No	Yes
MGQ6WG	No	No	No	Yes	RW4CQ3	No	No	No	Yes
MHZKBU	No	No	No	Yes	RX72PC	No	No	No	Yes
MR9KZJ	No	No	No	Yes	RXMEA3	No	No	No	Yes
MVKUQR	No	No	No	Yes	RYRBXQ	No	No	No	Yes
MZL3JN	No	No	No	Yes	RYZX9E	No	No	No	Yes
N822TT	No	No	No	Yes	RZCKUZ	No	No	No	Yes
NAKXNR	No	No	No	Yes	T2T74U	No	No	No	Yes
NLWVGE	No	No	No	Yes	T6BYPU	No	No	No	Yes
NN3JB7	No	No	No	Yes	T6JNX8	No	No	No	Yes
NV9MM6	No	No	No	Yes	T77U26	No	No	No	Yes
PAXMR4	No	No	No	Yes	TFAAZ3	No	No	No	Yes
PF69J8	No	No	No	Yes	TFCRUE	No	No	No	Yes
PJB7CU	No	No	No	Yes	TJ2C3B	No	No	No	Yes
PJVAXU	No	No	No	Yes	TJ2KWF	No	No	No	Yes
PTGYRF	No	No	No	Yes	TJTN44	No	No	No	Yes
PYMUCF	No	No	No	Yes	TPZHF8	No	No	No	Yes
Q7RL3Q	No	No	No	Yes	TRPPZ4	No	No	No	Yes
Q8GZ6G	No	No	No	Yes	TRPRL2	No	No	No	Yes
QBDJQT	No	No	No	Yes	TRU9YQ	No	No	No	Yes

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
TRWTQZ	No	No	No	Yes	W24E96	No	No	No	Yes
TTFMYF	No	No	No	Yes	W8EH8K	No	No	No	Yes
TW7GH4	No	No	No	Yes	WAF4NJ	No	No	No	Yes
TZ2ML8	No	No	No	Yes	WEAYQR	No	No	No	Yes
U266X3	No	No	No	Yes	WEYLC2	No	No	No	Yes
U6H3Z7	No	No	No	Yes	WF22BL	No	No	No	Yes
U7HDET	No	No	No	Yes	WKTVYR	No	No	No	Yes
U8TFZQ	No	No	No	Yes	WKWF49	No	No	No	Yes
UA9GK7	No	No	No	Yes	WWQ6XG	No	No	No	Yes
UAXDHU	No	No	No	Yes	WXQPT3	No	No	No	Yes
UFUAUK	No	No	No	Yes	X7WTGC	No	No	No	Yes
UFVPZB	No	No	No	Yes	X8DRUA	No	No	No	Yes
UKYZAQ	No	No	No	Yes	X8J6MQ	No	No	No	Yes
UNNHEC	No	No	No	Yes	X9LZ2A	No	No	No	Yes
UQFYN6	No	No	No	Yes	XCXHRK	No	No	No	Yes
UT437X	No	No	No	Yes	XD8U4U	No	No	No	Yes
UXE9MP	No	No	No	Yes	XDFWNE	No	No	No	Yes
V3QGQF	No	No	No	Yes	XQDDUE	No	No	No	Yes
V46TRJ	No	No	No	Yes	XVA87H	No	No	No	Yes
V68TG4	No	No	No	Yes	XVP2TP	No	No	No	Yes
V8KCMA	No	No	No	Yes	XZM839	No	No	No	Yes
VAV8GQ	No	No	No	Yes	Y2CBD8	No	No	No	Yes
VETZZ2	No	No	No	Yes	Y3Q3JQ	No	No	No	Yes
VH2XXG	No	No	No	Yes	Y7XEYQ	No	No	No	Yes
VH8UHJ	No	No	No	Yes	YBX3WY	No	No	No	Yes
VJRXJC	No	No	No	Yes	YFHCG3	No	No	No	Yes
VLHE3F	No	No	No	Yes	YGDAVH	No	No	No	Yes
VRKG92	No	No	No	Yes	YHT4MY	No	No	No	Yes
VTE9ZD	No	No	No	Yes	YMEAZY	No	No	No	Yes
VUVT2G	No	No	No	Yes	YMZUNJ	No	No	No	Yes
VY3U7E	No	No	No	Yes	YNDPLP	No	No	No	Yes
VYPBBA	No	No	No	Yes	YQR3TK	No	No	No	Yes

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
YXXQQK	No	No	No	Yes					
YYP8UW	No	No	No	Yes					
YZGDXT	No	No	No	Yes					
Z3NK3C	No	No	No	Yes					
Z9Y96U	No	No	No	Yes					
ZCG4TY	No	No	No	Yes					
ZG8FPG	No	No	No	Yes					
ZHWLFZ	No	No	No	Yes					
ZQQQ92	No	No	No	Yes					
ZR92WF	No	No	No	Yes					
ZW3VUG	No	No	No	Yes					
ZY6ZUW	No	No	No	Yes					
ZZV782	No	No	No	Yes					
ZZVEL9	No	No	No	Yes					

Response Summary

Participants: **328**

Were any of the questioned expended cartridge cases (Items 2-5) discharged from the same firearm as the known expended cartridge cases (Item 1)?

		Item 2	Item 3	Item 4	Item 5
Responses	Yes	**1** ***(0.3%)***	**1** ***(0.3%)***	**1** ***(0.3%)***	**328** ***(100.0%)***
	No	**320** ***(97.6%)***	**320** ***(97.6%)***	**320** ***(97.6%)***	**0** ***(0.0%)***
	Inc	**4** ***(1.2%)***	**4** ***(1.2%)***	**4** ***(1.2%)***	**0** ***(0.0%)***

The sum of the responses may be less than the total number of participants, if a participant did not report a response.

Conclusions

TABLE 2

WebCode	Conclusions
24UXVT	Item 2, item 3, and item 4 were microscopically compared and identified as being discharge by the same firearm. Item 5 was compared microscopically to items 2 through items 4 and was eliminated from those casings due to class characteristics (item 2 through items 4 have a circular firing pin with screw machine toolmarks while item 5 has a circular smooth/granular firing pin impression. Items 2 through item 4 were compared microscopically to the test standards marked item 1 and eliminated as having been discharged in the submitted firearm due to class characteristics i.e. firing pin impression. Item 5 was compared microscopically to the test standards mark item 1 and identified as being discharged by the submitted firearm.
24ZJXL	Item 5 was identified as having been fired in the firearm represented by Item 1, based on corresponding class and individual characteristics. Due to differences in class characteristics, Items 2, 3 and 4 were eliminated as having been fired in the firearm represented by Item 1. Items 2, 3 and 4 were identified as having been fired in one firearm, based on corresponding class and individual characteristics. Items 1 through 5 were microscopically examined.
26PFBY	In my opinion, the exhibit fired cartridge case (Item 5) was discharged in the exhibit .40 S&W calibre, CZ manufactured, Model 40B semi-automatic pistol. Further, in my opinion, the other exhibit fired cartridge cases (Items 2 to 4) were all discharged in the same, unknown firearm.
28JGLC	Items 1B through 1D are identified as having been fired in the same firearm. Item 1E is identified as having been fired in the same firearm as Items 1A1 through 1A3 (test shots reportedly from the CZ pistol). Items 1B through 1D are inconclusive as having been fired in the same firearm as Items 1A1 through 1A3 (test shots reportedly from the CZ pistol). These items share agreement of class characteristics, but disagreement of the individual characteristics observed in the breechface and firing pin aperture shear marks. The disagreement observed suggests Items 1B through 1D were fired in a different firearm. Submission of that firearm is necessary for further examination. Item 1C and 1A1 were entered into the National Integrated Ballistic Information Network (NIBIN) database. An investigative lead will be sent for all possible associations. Items entered in the database are searched in [States] only unless requested otherwise and will remain in the database unless a request to remove the entry is received.
2A7388	The below listed spent cartridge case was macroscopically and microscopically examined and compared with test fires (Lab Evidence# 001-A1) from the CZ 40 S&W firearm. It is my opinion that the below listed item was fired from this firearm (identification). Lab Evidence# Item# Description 001-A5 5 spent PMC 40 S&W cartridge case The below listed spent cartridge cases were macroscopically and microscopically examined and compared with test fires (Lab Evidence# 001-A1) from the CZ 40 S&W firearm. It is my opinion that these items were not fired from this firearm (elimination). The below listed spent cartridge cases were further compared with each other. It is my opinion that these items were fired from the same unknown firearm (identification). Lab Evidence# Item# Description 001-A2 2 spent PMC 40 S&W cartridge case 001-A3 3 spent PMC 40 S&W cartridge case 001-A4 4 spent PMC 40 S&W cartridge case
2XAEDB	Cartridge Case Analysis: Methodology: Physical (Visual Examination). Microscopy (Comparison Microscope). Item 5, the cartridge case, was fired in Item 1, the CZ pistol, based upon corresponding class and individual microscopic characteristics. Items 2, 3, and 4, the cartridge cases, were fired in the same firearm based upon corresponding class and individual microscopic characteristics. Items 2, 3, and 4, the cartridge cases, were not fired in Item 1, the CZ pistol, based upon different class characteristics.

TABLE 2

WebCode	Conclusions
2XTHLB	Cartridge Case Analysis: Methodology: Physical (Visual Examination). Microscopy (Comparison Microscope). Items 1A, 1B, 1C, and 5, the cartridge cases, were fired in the same firearm based upon corresponding class and individual microscopic characteristics. Items 2, 3, and 4, the cartridge cases, were fired in the same firearm based upon corresponding class and individual microscopic characteristics. Items 1A, 1B, 1C, and 5, the cartridge cases, were not fired in the same firearm as Items 2, 3, and 4, the cartridge cases, based upon different class characteristics.
36PAF6	Microscopic examination and comparison of the PMC cartridge cases (Items 1, 1A, 1B and 5) revealed sufficient agreement of individual characteristics to conclude that they were identified as having been fired in the same firearm. Microscopic examination and comparison of the PMC cartridge cases (Items 2, 3 and 4) revealed sufficient agreement of individual characteristics to conclude that they were identified as having been fired in the same firearm. Microscopic examination and comparison of the PMC cartridge cases (Items 1, 1A, 1B and 5) revealed they can be eliminated as having been fired in the same firearm as the PMC cartridge cases (Items 2, 3 and 4) based on differences in class and individual characteristics.
399UEY	As a result of the comparison, I formed the opinion that the exhibit fired cartridge cases (Items 2 to 4) had been discharged by the same, unknown firearm. Further, as a result of the comparison, I formed the opinion that the exhibit fired cartridge case (Item 5) had been discharged by the exhibit firearm (Item 1).
3BCVPD	The fired cartridge case, item 1.5, was identified as having been fired in the CZ pistol, item 1.1, based on the agreement of all discernable class characteristics and agreement of corresponding individual microscopic markings. The three (3) fired cartridge cases, items 1.2, 1.3, and 1.4, were each eliminated as having been fired in the CZ pistol, item 1.1, based on a difference in class characteristics (firing pin aperture (irregular vs round) and firing pin impression (circular vs smooth). The three (3) fired cartridge cases, items 1.2, 1.3, and 1.4, were each identified as having been fired in the same firearm based on the agreement of all discernable class characteristics and agreement of corresponding individual microscopic markings.
3PQ64N	Items 2 through 4 were compared to each other and they have the same class of firearm produced marks and sufficient corresponding individual microscopic marks to conclude that they were fired in a single firearm. I then compared Item 2 to Item 5 and found differences in class and individual marks. These cartridge cases were fired in different firearms. Item 5 was compared to the Item 1 test-fires and they have the same class of firearm produced marks and sufficient corresponding individual microscopic marks to conclude that Item 5 was fired in the same firearm as Item 1.
3PVPVB	Items 1 and 5: The cartridge cases were Identified as having been fired in the same firearm. Items 2, 3, and 4: The cartridge cases were identified as having been fired in the same firearm. The cartridge cases were Eliminated from the cartridge cases Items 1 and 5.
3YFY7X	The three comparison cartridge cases, item 1, show among themselves stably recurring traces of weapon parts with individual surface structures. Cartridge case Item 5 shows the same traces of weapon parts with individual surface structures as the three cartridge cases Item 1. Cartridge case Item 5 was detonated in the same Weapon as the cartridge cases Item 1 The cartridge cases Item 2, Item 3 and Item 4 show clear differences in the systematic and individual traces of weapon parts compared to the cartridge cases Item 1 and Item 5. It is excluded that the cartridge cases item 2, item 3 and item 4 were fired in the same weapon as the cartridge cases Item 1 and item 5. The three cartridge cases Item 2, Item 3 and Item 4 show among themselves the same systematic and individual traces of weapon parts with individual surface

TABLE 2

WebCode	Conclusions
	structures. They were detonated in one gun.
42CXY2	The cartridges cases marked as item 2,3 and 4 provided with the mentioned test (23-5261), weren't discharged from the same weapon of the expended cartridges cases of the item 1. The cartridge case marked as item 5 provided with the mentioned test (23-5261), was discharged from the same weapon of the expended cartridges cases of the item 1
43XLJV	This report refers to exhibits by Lab Number. The following results only apply to the items tested. The Exhibits 1 and 5 cartridge cases were identified as having been fired in the same firearm. The Exhibits 2, 3 and 4 cartridge cases were identified as having been fired in the same firearm. The Exhibits 1 and 5 cartridge cases were excluded as having been fired in the same firearm as the Exhibits 2, 3 and 4 cartridge cases. See the Appendix of this report for further context regarding the conclusions listed above. [Appendix not provided]
44QG3X	The four .40 S&W caliber cartridge cases (Items 2-5) were microscopically compared to test fired cartridge cases from the pistol (Item 01). Based on agreement of discernable class characteristics and sufficient corresponding individual markings observed, the cartridge case (Item 05) was identified as having been fired in the same pistol as the cartridge cases in Item 01.
464RGP	Examination of Exhibits 1 to 5 revealed .40 S&W cartridge cases produced by PMC that are suitable for comparison. Microscopic comparison concluded that the cartridge case in Exhibit 5 was fired in the same firearm as Exhibit 1 due to a sufficient agreement of individual characteristics. Microscopic comparison concluded that the cartridge cases in Exhibits 2, 3, and 4 were fired in the same firearm due to a sufficient agreement of individual characteristics. Microscopic comparison concluded the cartridge cases in Exhibits 1 and 5 were not fired in the same firearm as Exhibits 2, 3, and 4 due to an agreement of class characteristics and a sufficient disagreement of individual characteristics.
4B7KYT	Examinations showed Item 5 was discharged within the CZ 40B. Examinations showed Items 2, 3 and 4 were discharged within the same unknown firearm. Examinations showed Items 2, 3 and 4 were not discharged within the CZ 40B due to differences in class characteristics.
4D7GD8	Microscopic examination and comparison of the test fired 40 S&W caliber cartridge cases Item 1.1 to the one (1) fired 40 S&W caliber cartridge case Item 1.5 reveals agreement of all class characteristics along with corresponding individual characteristics establishing that Item 1.5 and was fired by the same firearm that fired the cartridge cases in Item 1.1. (Identification) Microscopic examination and comparison of the test fired 40 S&W caliber cartridge cases Item 1.1 to the three (3) fired 40 S&W caliber cartridge case Item 1.2, 1.3 and 1.4 reveals disagreement of individual characteristics establishing that Items 1.2, 1.3 and 1.4 were not fired by the same firearm that fired the cartridge cases in Item 1.1. (Elimination) Microscopic examination and comparison of the three (3) fired 40 S&W caliber cartridge case Items 1.2, 1.3 and 1.4 to each other reveals agreement of all class characteristics along with corresponding individual characteristics establishing that the three (3) fired 40 S&W caliber cartridge case Items 1.2, 1.3 and 1.4 were fired by the same unknown 40 caliber firearm. (Identification)
4EVAVX	Items 1 and 5 were identified as having been fired in the same firearm based on agreement in class and individual characteristics. Items 2 - 4 were identified as having been fired in the same firearm based on agreement in class and individual characteristics. Items 2 - 4 were excluded as having been fired in the same firearm as Items 1 and 5 based on differences in class characteristics.
4HKLZN	The cartridge case marked #5 was compared microscopically to test standards (#1) and was

TABLE 2

WebCode	Conclusions
	identified as having been discharged in the same firearm. The three cartridge cases marked #2, #3, and #4, were compared microscopically and were identified as having been discharged in the same firearm. The test standards (#1) and the cartridge case marked #5 were compared microscopically to the three cartridge cases marked #2, #3, and #4, and were eliminated as having been discharged in the same firearm.
4HML8W	The seven (7) cartridge cases (Items 1-5) were received in the Sample Pack: F1 - CTS 23-5261 - ([Lab] 2023-0090). The "PMC 40 S&W" cartridge case (Item 5) was identified as having been fired in the CZ 40B 40 S&W pistol (Item 1 - Per CTS, test fires from the CZ 40B pistol). Agreement of the characteristics is sufficient to determine that the firearm is the source of the cartridge case. The three (3) "PMC 40 S&W" cartridge cases (Items 2, 3 & 4) were identified as having been fired in the same firearm. Agreement of the characteristics is sufficient to determine that the three (3) cartridge cases were fired in the same firearm. The three (3) "PMC 40 S&W" cartridge cases (Items 2, 3 & 4) were excluded as having been fired in the CZ 40B 40 S&W pistol (Item 1 - Per CTS, test fires from the CZ 40B pistol). Differences were found in characteristics sufficient to eliminate the firearm as the source of the cartridge cases.
4J46L7	CONCLUSION : 1. Item 5 was identified within the limits of practical certainty as having been discharged in the exhibit CZ make, Model 40B, 40 S&W calibre, self loading pistol. 2. Items 2, 3 & 4 were not discharged in the exhibit CZ make, Model 40B, 40 S&W calibre, self loading pistol. 3. Items 2, 3 & 4 were identified within the limits of practical certainty as having been discharged in the same unidentified firearm.
4KWLMP	Items 2-5 were examined and microscopically compared to tests submitted as Item 1. Items 2-4 were fired in the same firearm based on the sufficient agreement of individual characteristics. Items 2-4 were not fired in the same firearm as the tests submitted as Item 1 based on different class characteristics. Item 3 will be compared to the open case file (IBIS/NIBIN). Item 5 was fired in the same firearm as the tests submitted as Item 1 based on the sufficient agreement of individual characteristics. The above analysis began on 06/07/2023.
4KXCZY	Items 2, 3 and 4 were all fired by the same unknown weapon capable of chambering and discharging .40 S&W caliber live ammunition, not the weapon that fired the test fires in Item 1. Item 5 was fired by the weapon used to create the test fires in Item 1.
4LQG7Q	Item 5 was identified as having been fired by the same firearm that fired Item 1. This identification is based on the agreement of class characteristics, and individual characteristics observed in the breechface impression marks and firing pin impression marks. Items 2 through 4 were eliminated as having been fired by the same firearm that fired Item 1. This elimination is based on the disagreement of individual characteristics observed in the breechface impression marks and firing pin impression marks. Items 2 through 4 were identified as having been fired by the same unknown firearm. This identification is based on the agreement of class characteristics, and individual characteristics observed in the breechface impression marks and firing pin aperture shear marks.
4RZXWL	The cartridge cases, Items 2, 3, and 4, were microscopically identified as having been fired in the same firearm. The cartridge case Item 5 was microscopically identified as having been fired in the same firearm as Item 1a (test). The cartridge case Item 2 was not fired in the same firearm as Item 1a (test).
4XH42Z	As a product of the comparison of the vanillas collected in boxes marked as item 2,3,4 and 5, reason for study, in relation to the reference samples collected in item 1, obatined from the CZ40B pistol type firearm, caliber .40 s&w found on the suspect, it is extended that the one identified as iten 5, described in Id EMP 5, presents a single source, that is, it was struck by the

TABLE 2

WebCode	Conclusions
	mentioned firearm
4Y2P9J	Item #1 and Item #5 were microscopically compared, and an identification was made. Item #1 and Item #5 were fired in the same firearm.
4YHX2J	The fired cartridge case, item 1.5, was identified as having been fired in the CZ pistol, item 1.1, based on the agreement of all discernable class characteristics and agreement of corresponding individual microscopic markings. The three (3) fired cartridge cases, items 1.2, 1.3, and 1.4, were identified as having been fired in the same firearm, based on the agreement of all discernable class characteristics and agreement of corresponding individual microscopic markings. The three (3) fired cartridge cases, items 1.2, 1.3, and 1.4, were each eliminated as having been fired in the CZ pistol, item 1.1, based on a difference in class characteristics (aperture shape (irregular vs circular) and firing pin impression marks (circular vs granular/irregular).
63AMY3	Item 5 was identified microscopically as having been fired in the same firearm that reportedly fired the Item 1 test fires based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 2-4 were microscopically eliminated as having been fired in the same firearm that reportedly fired the Item 1 test fires due to disagreement of discernible class characteristics. Items 2-4 were identified microscopically as having been fired in the same unknown firearm based on agreement of the combination of individual characteristics and all discernible class characteristics.
643HH6	Items 1A1, 1A2, 1A3 [1], and 1E [5] (fired cartridge cases) are identified as having been fired in the same firearm. Items 1B [2], 1C [3], and 1D [4] (fired cartridge cases) are identified as having been fired in the same firearm. Items 1B [2], 1C [3], and 1D [4] (fired cartridge cases) are eliminated as having been fired in the same firearm as Items 1A1, 1A2, 1A3 [1], and 1E [5]. There are differences in class characteristics (firing pin impression machining marks).
6AWCJC	1. The three 40 S&W cartridge cases (item 01-01) were identified as having been fired in a single firearm, reportedly a CZ model 40B pistol. 2. The 40S&W cartridge case (item 01-05) was identified as having been fired in the same firearm as the three 40S&W cartridge cases (items 01-01), reportedly a CZ model 40B pistol. 3. The three 40S&W cartridge cases (items 01-02, 01-03, and 01-04) were identified as having been fired in a single unknown firearm. They were eliminated from having been fired in the same firearm represented by the three test fired cartridge cases (item 01-01), reportedly a CZ pistol, due to significant differences in potential subclass characteristics and individual characteristics.
6C862J	The cartridge case (Item 5) discharged from the same firearm as the known expended cartridge cases (Item 1). Cartridge case Items (Items 2-4) were not discharged from the same firearm as the known expended cartridge cases (Item 1).
6CLJ4A	The submitted fired cartridge case, Item 5, and the submitted test fired cartridge cases, Items 1A, 1B, and 1C, were fired in the same firearm. The submitted fired cartridge cases, Items 2, 3, and 4, were fired in the same firearm. The submitted fired cartridge cases, Items 2, 3, and 4, were not fired in the same firearm as the submitted test fired cartridge cases, Items 1A, 1B, or 1C, or the submitted fired cartridge case, Item 5.
6E393C	The four 40 Smith & Wesson caliber cartridge cases (1, 5) were identified as having been fired in the same unknown firearm. The four 40 Smith & Wesson caliber cartridge cases (1, 5) were eliminated as having been fired in the same unknown firearm as the three 40 Smith & Wesson caliber cartridge cases (2 to 4). The three 40 Smith & Wesson caliber cartridge cases (2 to 4) were identified as having been fired in the same unknown firearm.

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6GJ4FX	Due to sufficient agreement of both class and individual characteristics, it was determined that the Item 5 fired cartridge case was fired in the same firearm as the Item 1 test fires (suspect weapon). Due to differences in class characteristics (firing pin), Items 2, 3, and 4 could not have been fired in the suspect weapon. Due to sufficient agreement of both class and individual characteristics, it was determined that Items 2, 3, and 4 were fired in the same unknown firearm.
6LZFCE	ITEM 5 WAS SHOCKED BY THE FIREARM DESCRIBED AS ITEM 1. ITEMS 2, 3 AND 4 WERE NOT SHOCKED BY THE FIREARM DESCRIBED AS ITEM 1.
6N6BFJ	After microscopic comparison, it was determined that Case #23-5261 Items #2,3,4,5, four (4) expended cartridge casings, WERE FIRED from the CZ 40B Cal .40 S&W firearm based on sufficient agreement of class and individual characteristics of the aperture shear marks and parallel breach face markings. There was sufficient quality and quantity of corresponding individual microscopic markings for identification.
6NVGN4	The Items 01-02, 01-03, and 01-04 cartridge cases were eliminated as having been fired in the same firearm as the Items 01-01 and 01-05 cartridge cases. The Items 01-02, 01-03, and 01-04 cartridge cases were identified as having been fired in the same unknown firearm capable of chambering and firing a 40 S&W caliber cartridge. The Item 01-05 cartridge case was identified as having been fired in the same firearm as the Item 01-01 cartridge cases.
6RPQR6	The following item contained sufficient microscopic individual characteristics and was identified as having been fired in item 1 (.40 Smith & Wesson caliber/Ceska Zbrojovka/model CZ-40B). Item 5: (1) .40 Smith & Wesson caliber fired cartridge case. The following items contained sufficient but different microscopic individual characteristics and were eliminated as having been fired in item 1 (.40 Smith & Wesson caliber/Ceska Zbrojovka/model CZ-40B). Item 2: (1) .40 Smith & Wesson caliber fired cartridge case. Item 3: (1) .40 Smith & Wesson caliber fired cartridge case. Item 4: (1) .40 Smith & Wesson caliber fired cartridge case. The following items exhibited the same class characteristics and contained sufficient microscopic individual characteristics and were identified as having been fired in the same unknown firearm. Item 2: (1) .40 Smith & Wesson caliber fired cartridge case. Item 3: (1) .40 Smith & Wesson caliber fired cartridge case. Item 4: (1) .40 Smith & Wesson caliber fired cartridge case.
73PVCG	Items 1, 5 : Item 5 was microscopically identified as having been fired in the Item 1 pistol. Items 2, 3, 4 : The three cartridge cases were microscopically identified as having been fired in the same unknown firearm; however, they were not fired in the Item 1 pistol.
78FBNJ	After comparison under the microscope it was found that item 1 (known) matches with the item 5 (questioned). They contain similar breech face markings and firing pin marks.
78LWL6	Item 5 (fired cartridge case) is identified as having been fired in the same firearm as test shots submitted by the investigating agency (Items 1A, 1B and 1C). Items 2, 3 and 4 (fired cartridge case) are identified as having been fired in the same firearm. Items 2, 3 and 4 (fired cartridge cases) are inconclusive as having been fired in the same firearm as test shots submitted by the investigating agency (Items 1A, 1B and 1C). These items share agreement of class characteristics, but disagreement of the individual characteristics observed in the breech face marks on the primer. Items 2 and 1B were entered into the National Integrated Ballistic Information Network (NIBIN) database. An investigative lead will be sent for all possible associations. Items entered in the database are searched in [State] only unless requested otherwise and will remain in the database unless a request to remove the entry is received. Conclusion Scale for Microscopic Comparisons: The following descriptions are meant to provide context to the levels of opinions reached in this report. Identification: This is the

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	strongest statement of association that can be expressed. An identification is made to a degree of practical certainty when there is agreement of all discernible class characteristics and sufficient agreement of the individual characteristics of toolmarks. When sufficient agreement exists, in part, this means the likelihood of another tool producing the same marks is so remote it is considered a practical impossibility. Elimination: This is the strongest statement of non-association that can be expressed. An elimination is made when it is physically impossible (i.e., there is a clear, demonstrable incompatibility in class characteristics) for the items to have been marked by the same tool/fired in the same firearm. Inconclusive: An inconclusive is made when one of the following situations is true. Agreement of all discernible class characteristics and some agreement of individual characteristics, but insufficient for identification. Agreement of all discernible class characteristics without agreement or disagreement of individual characteristics due to an absence, insufficiency, or lack of reproducibility. Agreement of all discernible class characteristics and disagreement of individual characteristics. Agreement of all discernible class and subclass characteristics. The individuality of the characteristics is not discernible; therefore, the items may have been fired from the same firearm or from another firearm that was machined with the same tool in the approximate same state of wear. Unsuitable: An item is considered unsuitable for comparison. The interpretation of the data and authorization of the results was performed by the undersigned forensic analyst. Other staff members may have performed laboratory activities concerning evidence associated with this report. For a complete listing of all staff members who performed laboratory activities in this case, please contact the laboratory via the telephone number above. [Telephone number not provided]
79977K	Examined the three specimens marked #1A, #1B, and #1C. They are test standards discharged in the seized firearm, a 40 S&W caliber CZ semiautomatic pistol, not submitted for examination. They are 40 S&W caliber discharged cartridge cases, headstamped PMC. Examined the four specimens marked #2 through #5. They are 40 S&W caliber discharged cartridge cases, headstamped PMC. The three cartridge cases marked #2 through #4 were compared microscopically and identified as having been discharged in the same firearm. The cartridge case marked #5 was compared microscopically against the submitted test standards and identified as having been discharged in the CZ pistol. The three cartridge cases marked #2 through #4 were compared microscopically against the test standards and were eliminated as having been discharged in the CZ pistol.
79XWXK	Items 1, 2, 3, 4 and 5: Items 1 and 5 were Identified to each other. Items 2, 3 and 4 were Identified to each other. Items 2, 3 and 4 were Eliminated from Items 1 and 5.
7AHNCN	Items 2, 3, and 4 were Identified to each other. Items 2, 3, and 4 were Eliminated to the Item 1 pistol. Item 5 was Identified to the Item 1 pistol.
7ARDZN	Based on an agreement of class and individual characteristics, Item 5 was identified as having been fired by the same firearm that fired Item 1 (test shots). Based on an agreement of class and individual characteristics, Items 2, 3 and 4 were identified as having been fired in the same unknown firearm. Items 2, 3 and 4 were eliminated as having been fired in the same firearm as Item 1 (test shots) based on differences in class characteristics.
7CP79Y	Items 2, 3, & 4 were Identified to each other. Items 2, 3, & 4 were Eliminated to Item 1. Item 5 was Identified to Item 1.
7ELMF9	Cartridge Case Analysis: Methodology: Physical (Visual Examination). Microscopy (Comparison Microscopy). Item 5, the cartridge case, was fired in the same firearm as Item 1, the test fired cartridge cases, based upon corresponding class and individual microscopic characteristics. Items 2, 3 and 4, the cartridge cases, were not fired in the same firearm as Item 1, the test

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	fired cartridge cases, based upon different class characteristics. Items 2, 3 and 4, the cartridge cases, were fired in the same firearm based upon corresponding class and individual microscopic characteristics. A reference from this group will be entered into NIBIN.
7G7TFW	All four questioned FCC's (Items 2 - 5), and the exhibit firearm (Item 1), all displayed discernible class characteristics. Items 2, 3 and 4 all displayed sufficient agreement in a combination of individual/random characteristics showing that they were fired in the same firearm, however, not the exhibit firearm (Item 1) - Elimination. The known FCC's (Item 1) and questioned FCC (Items 5) showed strong correspondence in irregular/random characteristics showing that the questioned FCC (Item 5) was fired in the exhibit firearm (Item 1) - Identification.
7PVWDT	The Item 5 cartridge case was Identified to the Item 1 cartridge cases. The Item 2, 3 and 4 cartridge cases were Identified to each other. The Item 2, 3 and 4 cartridge cases were Eliminated to the Item 1 cartridge cases and the Item 5 cartridge case.
7R2H6Y	The questioned vainilla described in ID EMP5 (item 5) was compared with the standard vainillas described in the correspondin ID EMP 1 (item 1), finding consistent identifying charactteristics between the; which means that a single source was found and that it was percussed by the same firearm that percussed the pattern vainillas item 1
7TT7CF	1. The cartridge cases marked E-1 to E-3, described in Item 1, and the cartridge case marked E-7, described in Item 5, are .40 S&W caliber, and were fired by the same firearm (Identification). [Examiner initials/date] 2. The cartridge case marked E-4, described in Items 2, the cartridge case marked E-5, described in Item 3, and the cartridge case marked E-6, described in the Item 4, are .40 S&W caliber, and were fired by the same firearm (Identification). [Examiner initials/date]
7VT79E	Exhibit 1 contains three .40 S&W fired cartridges cases suitable for comparison. Exhibits 2 through 5 each contain one .40 S&W fired cartridge case suitable for comparison. Microscopic examinations revealed the following: a. Exhibits 1 and 5 were fired in the same firearm due to sufficient agreement of individual characteristics. b. Exhibits 2, 3, and 4 were fired in the same firearm due to sufficient agreement of individual characteristics. c. Exhibits 1 and 5 were not fired in the same firearm as Exhibits 2, 3, and 4 due to sufficient disagreement of individual characteristics.
7XF633	Items 2, 3, 4, 5: A microscopic comparison was conducted between Test Cartridge Case 1, Item 1 that was fired in the recovered firearm and Items 2, 3, 4 and 5. The examinations determined Item 5 was fired in the recovered firearm due to a sufficient agreement between the firing pin and breech face markings. The examinations determined Items 2, 3 and 4 were not fired in the recovered firearm, due to a disagreement of individual characteristics. A microscopic comparison was conducted between Items 2, 3 and 4. The examinations determined Items 2, 3 and 4 were fired in the same firearm due to a sufficient agreement between the firing pin and breech face markings. Disposition: The above listed evidence will be forwarded to the Property Custody Section.
7ZE2DJ	Examined the three specimens marked #1A, #1B, and #1C. They are test standards discharged in the seized firearm, a 40 S&W caliber CZ semiautomatic pistol, not submitted for examination. They are 40 S&W caliber discharged cartridge cases, headstamped PMC. Examined the four specimens marked #2 through #5. They are 40 S&W caliber discharged cartridge cases, headstamped PMC. The three cartridge cases marked #2 through #4 were compared microscopically and identified as having been discharged in the same firearm. The cartridge case marked #5 was compared microscopically against the submitted test standards

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WebCode	Conclusions
	and identified as having been discharged in the CZ pistol. The three cartridge cases marked #2 through #4 were compared microscopically against the test standards and were eliminated as having been discharged in the CZ pistol.
8A7QQP	Exhibit 5 (fired .40 S&W casing) was identified as having been fired in the same firearm as Exhibit 1 (test fired casings). Exhibits 2 through 4 (fired .40 S&W casings) were identified as having been fired in a second .40 S&W firearm. Suspect weapons are unknown, however, any suspect weapon should be submitted to the laboratory for analysis.
8CTKY7	Item 5 is identified as having been in the same firearm as item 1. Items 2, 3 and 4 are identified as having been fired in the same firearm. Items 2, 3 and 4 are inconclusive as having been fired in the same firearm as item 1. These items share agreement of class characteristics, but disagreement of the individual characteristics observed in the firing pin and firing pin aperture. The disagreement suggests these items were fired in different firearms. Submission of that firearm is necessary for further examination.
8EGCQ4	The Items 01-01 and 01-05 cartridge cases were identified as having been fired in the same firearm. The Items 01-02 to 01-04 cartridge cases were eliminated as having been fired in the same firearm as the Items 01-01 and 01-05 cartridge cases. The Items 01-02 to 01-04 cartridge cases were identified as having been fired in the same unknown firearm that is capable of chambering and firing a 40 S&W caliber cartridge.
8FB6GF	Item #5 was microscopically compared to firearm, Item #1(Known) and an identification was made. Item #5 was fired in firearm, Item #1(Known). Item #2,#3 & #4 were microscopically compared to each other and were identified as having been fired in the same firearm.
8J826G	[No Conclusions Reported.]
8KW3UG	RESULTS: CARTRIDGE CASES: Items 1B and 5: The cartridge cases were Identified to each other. The cartridge cases were Eliminated to the Item 2, 3 and 4 cartridge cases. Items 2, 3 and 4: The cartridge cases were Identified to each other.
8LJ73J	Item 5 had been discharged in the same firearm as the known cartidge cases (Item 1). Items 2,3 and 4 had been discharged in a the same firearm but different firearm than the know cartidges cases (Item 1).
8MMWHT	[Lab] received the following inventory under the above Incident/Records Division Number (RD#). Items received: Item 1: Three (3) PMC 40 S&W cartridge cases (known test fires from CZ 40B Cal. 40 S&W firearm), labeled Exhibits 1A1, 1A2, and 1A3. Item 2: One (1) PMC 40 S&W cartridge case, labeled Exhibit A1. Item 3: One (1) PMC 40 S&W cartridge case, labeled Exhibit A2. Item 4: One (1) PMC 40 S&W cartridge case, labeled Exhibit A3. Item 5: One (1) PMC 40 S&W cartridge case, labeled Exhibit A4. FINDINGS Item 1 through Item 5 were microscopically examined and based on these examinations it was determined that: Item 5 was identified as having been fired in the CZ 40B Cal. 40 S&W firearm. Items 2, 3, and 4 were identified as having been fired in the same firearm. Items 2, 3, and 4 were eliminated as having been fired in the CZ 40B Cal. 40 S&W firearm based on differences in individual characteristics.
8NGHD6	One of the test fired shell casings (Ex.1) was compared to the evidence shell casings (Ex.2,3,4,5). Based on the agreement of individual characteristics and all discernible class characteristics, it was determined that one of the shell casings (Ex.5) was fired in the CZ pistol (Ex.1). (Identification). Based on significant disagreement of individual characteristics, it was determined that three of the shell casings (Ex.2,3,4) could not have been fired in the CZ pistol (Ex.1). (Elimination). The three shell casings (Ex.2,3,4) were compared to each other. Based on

TABLE 2

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	the agreement of individual characteristics and all discernible class characteristics, it was determined that all three shell casings (Ex.2,3,4) were all fired in the same gun. (Identification).
8RVMWD	Item 5 and Item 1 (test fired cartridge cases) were microscopically examined and compared. Based on observed agreement of class characteristics and sufficient agreement of individual characteristics, Item 5 was identified as having been fired in the same firearm that fired Item 1 (CZ 40 B pistol). Items 2, 3, and 4 were microscopically examined and compared. Based on observed agreement of class characteristics and sufficient agreement of individual characteristics, the cartridge cases were identified as having been fired in the same firearm. Item 1 (test fired cartridge cases) and Item 5 were microscopically examined and compared to Items 2, 3, and 4. Based on observed disagreement of individual characteristics, Items 2, 3, and 4 were eliminated as having been fired in the same firearm that fired Item 5 and Item 1 (CZ 40B pistol).
8UKUGA	Item 1: 03 - test fired cartridge casings from the recovered gun (40 S&W caliber, CZ 40B pistol): 40 S&W caliber, PMC, BP, marked: (23-0242h1, h2, h3) Items 2, 3, 4, 5: 04 - discharged cartridge casings: 40 S&W caliber, PMC, BP, marked: (23-0242ch2, ch3, ch4, ch5) Microscopic Examination: The above listed evidence was examined and compared to each other with the following results: Identification: Cartridge casing (item 5) is identified as having been fired by the recovered gun (40 S&W caliber, CZ 40B pistol) based on the observed agreement of class characteristics and sufficient agreement of individual characteristics, when compared to test fired cartridge casings (item 1 - marked 23-0242h1, h2, h3). Cartridge casings (items 2, 3, 4) are all identified as having been fired by a second gun based on the observed agreement of class characteristics and sufficient agreement of individual characteristics. Elimination: Cartridge casings (items 2, 3, 4) are eliminated as having been fired by the recovered gun (40 S&W caliber, CZ 40B pistol) based on the disagreement of individual characteristics, when compared to test fired cartridge casings / cartridge casing (item 1 - marked 23-0242h1, h2, h3) / (item 5).
97EWCA	1. The cartridge casings marked E-1 to E-3 (item 1) and E-7 (item 5), described in item 1, are .40 S&W caliber and were fired from the same firearm (identification). 2. The cartridge casings marked E-4 to E-6 (items 2, 3 and 4), described in item 1, are .40 S&W caliber and were fired from the same firearm (identification).
98NG6W	Item 1, Item 5 : Item 1 was Identified to Item 5. Items 2, 3, and 4: The items were Identified to each other. The items were Eliminated to Item 1 and Item 5 based on a difference in class characteristics.
9BLPZE	The suspect's firearm was identified as having fired one of the cartridge cases (5) from the scene. The suspect's firearm was eliminated as having fired the other three cartridge cases (2 - 4) from the scene. These three cartridge cases (2 - 4) were identified as having been fired from the same unknown firearm.
9DRJ8C	The four 40 S&W caliber cartridge cases recovered from the scene (Items 2, 3, 4, and 5) were examined and found to have been fired by two firearms. I compared the test fired cartridge cases from the CZ 40B pistol (Item 1) to the cartridge case (Item 5) and the same class of firearm produced marks and sufficient corresponding individual microscopic marks were found. The CZ pistol (Item 1) fired the cartridge case (Item 5). Items 2, 3, and 4 had the same class of firearm produced marks and sufficient corresponding individual microscopic marks to conclude that they were fired by a single firearm, but eliminated from having been fired by the CZ pistol (Item 1).
9KYCGV	Based upon agreement of all class characteristics and a sufficient quality and quantity of

TABLE 2

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	individual characteristics item 5 can be identified to the test fires from item 1. Based upon agreement of all class characteristics and some agreement of individual characteristics but an insufficient quantity of unique inconsistent individual characteristics my opinion as to items 2,3,4 is inconclusive as to an identification to the test fires from item 1.
9QU2ED	Item 2, 3, 4: The cartridge cases were all microscopically identified as having been fired in the same unknown firearm. The cartridge cases were not fired in the Item 1 pistol. Item 5: The cartridge case was microscopically identified as having been fired in the Item 1 pistol.
9RD3WZ	Case 1 and case 5 were fired with the same weapon (Item 1) Cases Items 2, 3, and 4 were fired by a second unknown weapon.
9UJQE6	One of the 40 S&W cartridge cases (Item 5) recovered from the crime scene was fired in the same firearm as the three test-fired cartridge cases (Item 1) from the suspect's firearm. The three remaining 40 S&W cartridge cases (items 2 through 4) recovered at the crime scene were fired in the same firearm, but were not fired in the same firearm as the three test-fired cartridge cases (Item 1) from the suspect's firearm.
9ZLPFZ	[Lab] Case: 2023-004107 Agency Case: 23-5261-[Lab] The submitted cartridge cases were physically, visually and microscopically examined and their characteristics noted. Microscopic examination and comparison of the test fired cartridge cases from the 40 S&W caliber CZ pistol Item 1.1 to the one (1) fired 40 S&W caliber cartridge case Item 1.5 reveals agreement of all class characteristics along with sufficient corresponding individual characteristics establishing that Item 1.5 was fired by the 40 S&W caliber CZ pistol Item 1.1. (IDENTIFICATION) Microscopic examination and comparison of the test fired cartridge cases from the 40 S&W caliber CZ pistol Item 1.1 to the three (3) fired 40 S&W caliber cartridge cases Items 1.2 through 1.4 reveals disagreement of class and individual characteristics establishing that Items 1.2 through 1.4 were not fired by the 40 S&W caliber CZ pistol Item 1.1. (ELIMINATION) Microscopic examination and comparison of the three (3) fired 40 S&W caliber cartridge cases Items 1.2 through 1.4 reveals agreement of all class characteristics along with sufficient corresponding individual characteristics establishing that Items 1.2 through 1.4 were fired by the same unknown 40 S&W caliber firearm. (IDENTIFICATION) All evidence shall be forwarded to the [Lab] evidence section for return. The firearm conclusions formulated from the listed examinations and the findings/results/opinions expressed in this document have been based upon the AFTE Theory of Identification, its Range of Conclusions and general standard identification practices commonly employed within the field of Firearm and Toolmark Identification.
A3FAKC	Items 1 to 5--Seven (7) fired cartridge cases in caliber 40 Smith & Wesson bearing a hemispherical firing pin impression. Items 1 & 5 were microscopically compared to each other and were identified as having been fired in the same firearm. Items 2, 3, and 4 were microscopically compared to each other and were identified as having been fired in the same firearm. Items 1 & 5 were eliminated from fired cartridge case(s), Items 2, 3, and 4 due to differences in individual characteristics.
A4K3WX	Items 1-(T1, T2, T3) and 5: Item 1-T1 was Identified to Item 5. Items 1 and 5 were Eliminated to Items 2, 3 and 4 based on a difference in class characteristics. Items 2, 3 and 4: The cartridge cases were Identified to each other. Items 2, 3, and 4 were Eliminated to Items 1 and 5 based on a difference in class characteristics.
A9WJFG	Results of Examinations: Item 1 consists of three cartridge cases reported to be test fires from a .40 S&W caliber CZ pistol, Model 40B. Items 2 through 5 are .40 S&W caliber cartridge cases which bear the headstamp of PMC ammunition. The Item 5 cartridge case was identified as

TABLE 2

WebCode	Conclusions
	having been fired in the same firearm as the Item 1 test fires. The Item 2, 3, and 4 cartridge cases were identified as having been fired in the same firearm and were eliminated from having been fired in the same firearm as the Item 1 test fires and Item 5 cartridge case, due to a difference in class characteristics.
AA6VWJ	Results of Examinations: Items 1 through 5 are .40 S&W caliber cartridge cases bearing the headstamp of PMC ammunition. The Item 1 and Item 5 cartridge cases were identified as having been fired in the same firearm. The Item 2, 3 and 4 cartridge cases were identified as having been fired in the same firearm, but excluded from having been fired in the same firearm as Item 1.
AF6ABE	Item's #1 and #5 were compared against each other and were identified as having been fired in the same firearm. Items' #2,3,4 were compared against each other and were identified as having been fired in the same firearm.
AFJVM3	Items 2, 3 and 4 (fired cartridge cases) are identified as having been fired in the same firearm. Item 5 (fired cartridge case) is identified as having been fired in the same firearm as Items 1A, 1B and 1C (reported test shots). Items 2, 3 and 4 (fired cartridge cases) are eliminated as having been fired in the same firearm as Items 1A, 1B and 1C (reported test shots). There are differences in the class characteristics (differences in firing pin impression concentric circles vs no concentric circles). Items 1A and 2 were entered into the National Integrated Ballistic Information Network (NIBIN) database. An investigative lead will be sent for all possible associations. Items entered in the database are searched in [State] only unless requested otherwise and will remain in the database unless a request to remove the entry is received.
AJ2L2Q	As a result of these observations (normally detailed in a preceding paragraph), I formed the following opinions: Three of the exhibit fired cartridge cases (Items 2, 3 & 4) were not discharged in the seized CZ, Model 40B, semi-automatic pistol. The fourth exhibit fired cartridge case (Item 5) was discharged in the CZ, Model 40B, semi-automatic pistol.
AKG9QE	1. Exhibit 1 contains three fired .40 S&W cartridge cases consistent with those marketed by PMC. These are all indicated as test standards from a suspect weapon. 2. Exhibits 2, 3, 4, and 5 each contain one fired .40 S&W cartridge case consistent with those marketed by PMC. 3. Microscopic comparison of Exhibits 1 through 5 revealed the following. a. Exhibit 5 was fired from the same firearm as Exhibit 1 due to a sufficient agreement of individual characteristics. b. Exhibits 2, 3, and 4 were fired from the same firearm due to a sufficient agreement of individual characteristics. Exhibits 2, 3, and 4 were not fired from the same firearm as Exhibit 1 due to a sufficient disagreement of individual characteristics.
AKWNTU	Test fired cartridge cases from Item 1-1 were microscopically compared to Item 1-5 and found to have areas of corresponding individual characteristics. Item 1-5 was identified as having been fired in the same firearm as Item 1-1. Items 1-2, 1-3, and 1-4 were microscopically compared to each other and found to have areas of corresponding individual characteristics. They were identified as having been fired in the same firearm. Items 1-2, 1-3, and 1-4 were microscopically compared to the test fired cartridge cases in Item 1-1 and found to have different class characteristics. They were eliminated as having been fired in the same firearm as Item 1-1.
ARV4KM	The cartridge case in Item 5 was fired in the same gun that fired the cartridge cases in Item 1, based on agreement observed in individual characteristics. The cartridge cases in Items 2, 3 and 4 were not fired in the same gun that fired the cartridge cases in Item 1, based on differences observed in class characteristics. The cartridge cases in Items 2, 3 and 4 were fired in the same gun, based on agreement observed in individual characteristics.

TABLE 2

WebCode	Conclusions
AVDEKD	1. Exhibit 1.5 was fired from the known firearm that fired Exhibit 1.1 based on sufficient agreement of individual characteristics. 2. Exhibits 1.2, 1.3, 1.4 were fired from the same unknown .40 S&W caliber firearm based on sufficient agreement of individual characteristics.
AVTD84	Examinations showed that Item 5 was discharged from the same firearm as the Item 1 test fired cartridge case. Examination showed that Item 2, Item 3 and Item 4 were not discharged from the same firearm as the Item 1 fired cartridge cases.
AWQXHN	The cartridge case in Item 5 was fired in the same gun that fired the cartridge cases in Item 1, based on agreement observed in individual characteristics. The cartridge cases in Items 2, 3 and 4 were not fired in the same gun that fired the cartridge cases in Item 1, based on differences observed in class characteristics.
AZCTAN	The Exhibit 1.1 – 1.3 and 5 cartridge cases were identified as having been fired in the same firearm. The Exhibit 2 - 4 cartridge cases were identified as having been fired in the same firearm. The Exhibit 1.1 – 1.3 and 5 cartridge cases were excluded as having been fired in the same firearm as the Exhibit 2 - 4 cartridge cases.
AZMAUA	A. The cartridges cases described in the Item 1 and the cartridge case described in the Item 5 are .40 S&W caliber and were fired by the same firearm (Identification). B. The cartridges cases described in the Items: 2, 3 and 4, are .40 &W caliber and were fired by the same firearm (Identification).
B6DYUD	Item 5 cartridge case was fired as the Item 1 cartridge case. Item 2, 3, 4 cartridge cases were different from the firearm used to fire Item 1 cartridge case.
B7AEJF	RESULTS: Items 1, 2, 3, 4 and 5 Items 1 and 5 were Identified to each other. Items 2, 3 and 4 were Identified to each other. Items 2, 3 and 4 were Eliminated from Items 1 and 5.
BJZKL6	A test fired cartridge case from Item 1 was microscopically examined and compared with a recovered fired cartridge case, Item 5. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Item 5 is identified as having been fired in the same firearm as Item 1. The test fired cartridge cases from Item 1 were microscopically examined and compared with the recovered fired cartridge cases, Items 2, 3, and 4. There is observed agreement of some class characteristics. However, based on the observed disagreement of individual characteristics, Items 2, 3, and 4 were not identified as having been fired in the same firearm as Item 1.
BMJLNL	I made a comparatrive microscopic examination of the three test fired cartridge cases (1) using a comparison microscope. This type of examination allows two objects to be viewed simultaneously so that microscopic marks left behind on the fired cartrdige cases during discharge can be compared and assessed. This was done to determine which marks on the test fired cartridge cases replicates. I then performed a similar comparison between these test fired cartridge cases and the question fired cartridge cases, Item 2 to Item 5. As a result of this examination I formed the following opinion: Item 5 were discharged by the same firearm that discharged the test fired cartridge cases, Item 1. Items 2-4 were discharged in a second firearm.
BMUAFC	I microscopically compared the test-fired cartridge cases, item 1, to the four unknown cartridge cases, items 2 through 5. I found differences in the class characteristics between a test-fired cartridge case and items 2, 3, and 4, based on firing pin impression marks and firing pin aperture marks. I concluded that items 2, 3, and 4 were not fired in the same firearm as the test-fired cartridge cases. I found sufficient agreement for identification between a test-fired cartridge case and item 5, based on firing pin impression marks. I concluded that item 5 was

TABLE 2

WebCode	Conclusions
	fired in the same firearm as the test-fired cartridge cases.
BMXP93	Laboratory Items 001.B (Item 2), 001.C (Item 3), and 001.D (Item 4) three spent brass PMC 40 S&W cartridge cases are identified as being fired by the same firearm. Laboratory Items 001.B (Item 2), 001.C (Item 3), and 001.D (Item 4) three spent brass PMC 40 S&W cartridge cases are eliminated as being fired by the same firearm as Laboratory Item 001.A (Item 1) test fires from CZ model 40B, 40 S&W caliber firearm. Laboratory Item 001.E (Item 5) spent brass PMC 40 S&W cartridge case is identified as being fired by the same firearm as Laboratory Item 001.A (Item 1) test fires from CZ model 40B, 40 S&W caliber firearm.
BRUQE7	The fired cartridge cases of items #2, #3 and #4 were microscopically identified as having been fired in the same unknown firearm. The fired cartridge case of item #5 was microscopically identified as having been fired in the CZ pistol that fired items #1(T1-T3).
BW7HLY	Based on microscopic comparisons, in the opinion of the laboratory: Item 1-5-1 cartridge case was identified as having been fired by the same firearm that fired item 1-1-1 "test fired" cartridge cases. Items 1-2-1, 1-3-1, and 1-4-1 cartridge cases were all identified as having been fired by the same unknown firearm. Based on differences in class characteristics, items 1-2-1, 1-3-1, and 1-4-1 cartridge cases were eliminated as having been fired by the firearm that fired item 1-1-1 "test fired" cartridge cases.
BXFAPE	Exhibit 5 (fired .40 S&W casing) was identified as having been fired in the same firearm that fired exhibit 1 (test fired casings). Exhibits 2 through 4 (fired .40 S&W casings) were identified as having been fired in a second .40 S&W firearm. Suspect weapons are unknown at this time; however, any suspect weapon should be submitted for analysis.
BZY72Z	A comparison of Item 5 to Item 1 was performed. Based on the agreement of individual characteristics and all discernible class characteristics, it was determined that the shell casing from Item 5 was fired in Item 1. (Identification) Items 2, 3 and 4 were compared to Item 1. Items 2, 3 and 4 have the same class characteristics as Item 1 but lacked corresponding individual characteristics. (Elimination) Items 2, 3 and 4 were compared to each other. Based on the agreement of individual characteristics and all discernible class characteristics, it was determined that Items 2, 3 and 4 were fired in the same firearm. (Identification)
C2D6TD	The fired cartridge cases listed as items 2, 3, 4 and 5 were compared to the test fired cartridge cases listed as item 1. The test fired cartridge cases were said to have been fired in a .40 Smith and Wesson calibre CZ model 40B handgun that was identified as being seized from the suspect. As a result of this comparison, I formed the following opinions: Item 5 was fired in the CZ model 40B handgun. Items 2, 3 and 4 were not fired in the CZ model 40B handgun.
C7JL8H	Item 5 was short frome the same pistol as the Item 1. Item 2, 3 and 4 were shot from the same one pistol, diffrent then the Item 1.
C9U3J2	CARTRIDGE CASES : Items 1 and 5: The cartridge case Item 5 was Identified as having been fired in the same firearm as the cartridge cases Item 1, which were said to have been test fired in the suspect's firearm. Items 2, 3, and 4: The cartridge cases Items 2, 3, and 4 were Identified as having been fired in a single firearm. However, these cartridge cases were Eliminated from the cartridge cases Items 1 and 5.
CEKVQF	Item 001-5 was fired in the recovered pistol. Items 001-2 through 001-4 were fired from the same firearm, but they were not fired in the recovered pistol.
CETM9P	Visual and microscopic analyses of the evidence cartridge cases Q1 through Q4 (Items 2 through 5) and test fired cartridge cases from K1 CZ pistol TF1 through TF3 (Item 1) were initiated on 7/17/2023 and the results of the comparisons and evaluations are as follow:

TABLE 2

WebCode	Conclusions
	Based on agreement of discernible class characteristics and sufficient agreement of individual characteristics. Q4 (Item 5) can be identified as having been fired with K1 CZ pistol suspect firearm (Item 1). Q1 through Q3 (Items 2 through 4) can be identified as having been fired with the same unknown firearm, and excluded as having been fired with K1 CZ suspect pistol (Item 1) due to differences in individual characteristics present.
CK9YKY	Fired cartridge case Item 1 and Item 5 were identified as having been fired in the same firearm based on agreement of class characteristics and sufficient agreement of individual characteristics within the firing pin impression marks and breechface marks. Fired cartridge case Item 2, Item 3, and Item 4 were identified as having been fired in the same firearm based on agreement of class characteristics and sufficient agreement of individual characteristics within the breechface marks and aperture shear. Fired cartridge case Item 1 and Item 5 were eliminated from having been fired in the same firearm as fired cartridge case Item 2, Item 3, and Item 4 based on disagreement of class characteristics.
CMEHPL	The cartridge case in Item 5 was fired in the gun that fired the cartridge cases in Item 1, based on agreement observed in individual characteristics. The cartridge cases in Items 2 through 4 were not fired in the gun that fired the cartridge cases in Item 1, based on differences observed in class characteristics.
CTVLEU	The cartridge cases (experimental samples) placed in Object No. 1 and the cartridge case in Object No. 5 were fired from the gun recovered from the crime scene/suspect. (CZ 40B cal) The cartridge cases placed in Object No. 2, Object No. 3 and Object No. 4 were fired from one and the same unknown gun (not recovered from the crime scene)
CVGZMH	QC-4 (Item 5) was fired in K-1. This conclusion was based on an agreement of all discernible class characteristics and sufficient agreement of individual characteristics. QC-1 (item 2), QC-2 (item 3), and QC-3 (item 4) were fired in the same unknown firearm. This conclusion was based on an agreement of all discernible class characteristics and sufficient agreement of individual characteristics. QC-1 (item 2), QC-2 (item 3), and QC-3 (item 4) were not fired in K-1. This conclusion was based on a difference in class characteristics.
CWKH6E	Results, Opinions, and Interpretations: Comparisons: The evidence cartridge cases were examined and microscopically compared to the test fired cartridge cases reportedly fired from the CZ pistol with the following results: One cartridge case (Lab Item 5) was identified as having been fired in the CZ pistol. Three cartridge cases (Lab Items 2-4) were identified as having been fired in a single firearm, however they were eliminated as having been fired in the CZ pistol due to differences in individual characteristics.
CXEBVR	After a microscopic evaluation, Item 5 was identified as having been fired in the suspect's CZ 40B 40 S&W caliber firearm based on a sufficient agreement of individual characteristics in the breechface marks. Items 2, 3, and 4 were eliminated as having been fired in the suspect's firearm based on a significant disagreement of individual characteristics in the breechface marks. Items 2, 3, and 4 were identified as having been fired in the same firearm based on a sufficient agreement of individual characteristics in the breechface marks.
D4G3WE	Submissions 2 through 5 were microscopically compared. Based on similar class characteristics and sufficient agreement of individual characteristics, submissions 2 through 4 are concluded to have originated from the same source. Due to a difference in class characteristics submission 5 was excluded as having originated from the same source as 2 through 4. Submissions 5 and 2 were microscopically compared to 1 test fires (reported as being test fired from a CZ model 40B .40S&W caliber pistol). Based on similar class characteristics and sufficient agreement of individual characteristics, submission 5 is concluded to have originated

TABLE 2

WebCode	Conclusions
	from the same source that produced 1 test fires (reported as being test fired from a CZ model 40B .40S&W caliber pistol). Due to a difference in class characteristics submissions 2 through 4 were excluded as having originated from the same source as 1 test fires (reported as being test fired from a CZ model 40B .40S&W caliber pistol).
DAPV3Q	Item 5 was identified microscopically as having been fired in the same firearm that reportedly fired the Item 1 test fires based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 2-4 were microscopically eliminated as having been fired in the same firearm that reportedly fired the Item 1 test fires due to disagreement of discernible individual characteristics. Items 2-4 were identified microscopically as having been fired in the same unknown firearm based on agreement of the combination of individual characteristics and all discernible class characteristics.
DDE6KX	The following item contained sufficient microscopic individual characteristics and was identified as having been fired in Item 1 (.40 Smith & Wesson caliber/Ceska Zbrojovka, model 40B, semiautomatic pistol). Item 5: (1) .40 Smith & Wesson caliber fired cartridge case. The following item contained different class characteristics than Item 1 (.40 Smith & Wesson caliber/Ceska Zbrojovka, model 40B, semiautomatic pistol) and was eliminated as having been fired in this firearm. Item 2: (1) .40 Smith & Wesson caliber fired cartridge case. The following items exhibited the same class characteristics and contained sufficient microscopic individual characteristics and were identified as having been fired in the same unknown firearm. Item 2: (1) .40 Smith & Wesson caliber fired cartridge case. Item 3: (1) .40 Smith & Wesson caliber fired cartridge case. Item 4: (1) .40 Smith & Wesson caliber fired cartridge case.
DPQDHJ	Casings item 1 and item 5 were percussion from the same firearm. Casings item 2, item 3 and item 4 were percussed by a different firearm than item 1.
DQ74VE	Comparisons performed between the test fired cartridge cases (Item 1) and cartridge case (Item 5) resulted in an identification. The spent cartridge case (Item 5) has been identified as having been fired in the listed firearm. Comparisons performed between the test fired cartridge cases (Item 1) and cartridge cases (Items 2-4) resulted in an exclusion. The spent cartridge cases (Items 2-4) were NOT fired in the listed firearm. Comparisons performed between cartridge cases (Items 2-4) resulted in an identification.
DR8RK6	Item 1 (test fire) and item 5 are an identification. Item 1 (test fire) and items 2-4 are an elimination.
DUKA8A	the case No. 5 whas shot from the same weapon as the three expended cartridge cases discharged from the suspect's weapon (No. 1). cases No. 2,3,4 where shot from the same weapon but other weapon than cartridge cases No. 1& No. 5.
E2QQNF	Items 2 through 4 were identified as having been fired by the same unknown firearm based on the agreement of class and individual characteristics. Item 5 was identified as having been fired by the firearm that fired Item 1 (A - C) tests based on the agreement of class and individual characteristics. Items 2 through 4 were not fired by the firearm that fired Item 1 (A - C) tests based on differences in class characteristics.
E2RPKA	The Item 1 through 5 PMC caliber 40 Smith & Wesson cartridge cases were examined microscopically. Items 1 and 5 were identified as having been fired in the same firearm based on corresponding class and individual characteristics. Items 2, 3, and 4 were identified as having been fired in the same firearm based on corresponding class and individual characteristics. Items 2, 3, and 4 were eliminated as having been fired in the same firearm as Items 1 and 5 based on a difference in class characteristics.

TABLE 2

WebCode	Conclusions
E8R8VF	Item 001-05 was identified as having been fired from the CZ model 40B, .40 S&W caliber pistol that fired Item 001-01 based on the agreement of class characteristics and individual characteristics observed in the breechface impression marks. Items 001-02 through 001-04 were identified as having been fired from the same unknown firearm based on the agreement of class characteristics and individual characteristics observed in the breechface impression marks.
E9LYLR	Similarities have been observed between marks in Item 5 and Item 1. The class characteristics in the items 2, 3 and 4 differ from those in item 1. Due to this difference these items cannot have been fired by the same firearm as the test fired cartridge cases Item 1. Similarities have been observed between the marks in Item 2, 3 and 4. Using the Bayesian approach in casework we view our findings under two hypotheses. In this test we used the following two hypotheses for Items 1 and 5 H1: The questioned cartridge case is fired by the submitted firearm H2: The questioned cartridge case is fired by another firearm of the same caliber and with the same class characteristics as the submitted firearm. The findings are extremely more probable when H1 is true than when H2 is true In this test we used the following two hypotheses for Items 2, 3 and 4 H3: The questioned cartridge cases are fired by one firearm H4: The questioned cartridge cases are fired by two or more firearms of the same caliber and with the same class characteristics. The findings are extremely more probable when H3 is true than when H4 is true The likelihood ratio (LR) of the findings is expressed in the following verbale scale: Approximately equally probable (LR = 1-2) Slightly more probable (LR = 2-10) More probable (LR = 10-100) Much more probable (LR = 100-10,000) Very much more probable (LR = 10,000-1,000,000) Extremely more probable (LR >1,000,000)
EB4MY8	1. The cartridges cases marked E-1 to E-3, described in Item 1 and the cartridge case marked E-7, described in Item 5 are .40 S&W caliber and were fired by the same firearm (Identification). [Examiner initials/date] 2. The cartridges cases marked E-4, described in Item 2, the cartridge case marked E-5, described in Item 3 and the cartridge case marked E-6, described in Item 4 are .40 S&W caliber and were fired by the same firearm (Identification). [Examiner initials/date]
EPP6M4	Results of Examinations: The Item 5 cartridge case was identified as having been fired in the Item 1 firearm. The Item 2 through 4 cartridge cases were identified as having been fired in the same firearm and were eliminated as having been fired in the Item 1 firearm.
EQKJHA	Microscopic examination determine that Item 5 was fired from the same firearm as the submitted Item 1 test fires. Items 2, 3, 4 were fired from a single firearm different from Item 1.
EQXA8K	The fired cartridge cases in items 001-02 through 001-05 were microscopically compared with the test fired cartridge cases in item 001-01 with the following results: Items 001-02, 001-03 and 001-04 were eliminated as having been fired in the same firearm as the items in 001-01. Item 001-05 was identified as having been fired in the same firearm as the items in 001-01.
ER9PLX	ITEM 5 WAS DISCHARGED FROM THE SUSPECT'S PISTOL-ITEM 1 ITEM 2, 3 AND 4 WERE DISCHARGED FROM A SAME PISTOL, DIFFERENT FROM SUSPECT'S FIREARM.
ETMUGB	RESULTS: Items 1A, 1B, 1C, and 5: Items 1B and 5 were Identified to each other. Items 2, 3, and 4 were Identified to each other. Items 1(A, B, & C), and 5 were Eliminated to Items 2, 3, and 4. REMARKS: The method of testing for ammunition components (that have results that fall into the range of conclusions defined below) included physical examination and microscopic comparison. Elimination results that are reported as based on a difference in class characteristics include only physical examination. Identified: Agreement of all discernible class characteristics and sufficient agreement of individual characteristics where the extent of

TABLE 2

WebCode	Conclusions
	agreement leads to the conclusion that the items were fired in/from the same firearm. Inconclusive (+): Agreement of all discernible class characteristics and some agreement of individual characteristics but insufficient for an identification. Inconclusive: Agreement of all discernible class characteristics without significant agreement or disagreement of individual characteristics; therefore, the items could neither be identified nor eliminated as having been fired in/from the same firearm. Inconclusive (-): Agreement of all discernible class characteristics and some disagreement of individual characteristics, but insufficient for an elimination. Eliminated: Significant disagreement of discernible class characteristics and/or individual characteristics leading to the conclusion that the items were not fired in/from the same firearm.
EU2TLF	There is sufficient agreement of a combination of individual characteristics and some detectable class characteristics between item 1 and item 5 suggesting a possible common origin. Impressions on Items 2, 3 and 4 did not match with those on the known item 1 suggesting a possible uncommon origin.
EZAA2V	The Item 1 cartridge cases (listed as having been discharged within a CZ 40B caliber .40 S&W firearm) and the Item 5 cartridge case were identified as having been discharged within the same firearm. The Item 2, 3, and 4 cartridge cases were identified as having been discharged within a second firearm. They were eliminated as having been discharged within the same firearm as Items 1 and 5 due to sufficient differences in individual characteristics. THE FOLLOWING DEFINITIONS RELATE TO THE FINDINGS PROVIDED BY THE EXAMINER IN THIS REPORT: Identification is an examiner's conclusion that two (2) or more items were marked by the same firearm. The class characteristics and individual characteristics left on the items by the firearm are in sufficient agreement such that it is the examiner's opinion that it is extremely unlikely any firearms other than those identified are capable of producing marks exhibiting sufficient agreement for identification. Elimination is an examiner's conclusion that two (2) or more items were marked by different firearms. The class characteristics and/or the individual characteristics left on the evidence by the firearm are in sufficient disagreement to conclude that the items were discharged by different firearms.
EZEV3N	1) Examinations showed that Item 2, Item 3 and Item 4 were not discharged within the same firearm as Item 1. 3) Examinations showed that Item 5 was discharged within the same firearm as Item 1.
EZXXTW	Items 1, 2, 3, 4, 5: A microscopic comparison was conducted between Test Cartridge Case # 1A, Item 1 that was fired in the recovered firearm and Items 2, 3, 4 and 5. The examinations determined that Item 5 was fired in the recovered firearm, due to a sufficient agreement between firing pin and breech face markings. The examinations determined that Items 2, 3 and 4 were not fired in the firearm, Item 1, due to a disagreement of individual characteristics. A microscopic comparison was conducted between Items 2, 3 and 4. The examinations determined that Items 2, 3 and 4 were fired in the same firearm due to a sufficient agreement between firing pin and breech face markings. Disposition: The above listed evidence will be forwarded to the Property Custody Section. All firearm comparison examinations were conducted using the AFTE's (Association of Firearm & Tool Mark Examiners) Theory of Identification. Identifications are the opinion of a qualified examiner that two tool marks were made by the same tool based on sufficient agreement of individual characteristics. The agreement of individual characteristics is of a quantity and quality that the likelihood another (different) tool could have made the mark is so remote as to be considered a practical impossibility. All exclusions and inconclusive findings were based upon exemplars available at the time of the examinations.

TABLE 2

WebCode	Conclusions
F4MAXM	The four 40 S&W caliber fired cartridge cases (Exhibits ITEM 2 - ITEM 5) were microscopically compared to the cartridge cases test fired in the CZ pistol (Exhibit ITEM 1). The 40 S&W caliber fired cartridge case (Exhibit ITEM 5) bears the same class characteristics and sufficient reproducing individual characteristics for an identification as having been fired in the CZ pistol. Three of the 40 S&W caliber fired cartridge case (Exhibits ITEM 2 - ITEM 4) bear different reproducing individual characteristics than the CZ pistol and could not have been fired in this pistol; however, they bear the same class characteristics and sufficient reproducing individual characteristics for an identification as having been fired in the same unknown firearm.
F9DDB4	Item 5 and Item 1 (the test fired cartridge cases) were microscopically examined and compared. Based on observed agreement of class characteristics and sufficient agreement of individual characteristics, the cartridge case was identified as having been fired in the same firearm that fired Item 1 (CZ semiautomatic pistol). Items 2, 3, and 4 were microscopically examined and compared. Based on observed agreement of class characteristics and sufficient agreement of individual characteristics, the cartridge cases were identified as having been fired in the same firearm. Items 2 and 1 (the test fired cartridge cases) were microscopically examined and compared. Based on observed disagreement of class and individual characteristics, the cartridge cases were eliminated as having been fired in the same firearm.
FBANNK	Examinations showed Item #5 was discharged within the same firearm as Item #1. Examinations showed Items #2, #3 and #4 were not discharged within the same firearm as Item #1.
FBVZRY	The 40 Smith & Wesson caliber cartridge case (5) was identified as being fired in the CZ model 40B pistol (1). The 40 Smith & Wesson caliber cartridge case (5) was eliminated as being fired in the same unknown firearm as the three 40 Smith & Wesson caliber cartridge cases (2 – 4). The three 40 Smith & Wesson caliber cartridge cases (2 – 4) were identified as being fired in the same unknown firearm. The three 40 Smith & Wesson caliber cartridge cases (2 – 4) were eliminated as being fired in the CZ model 40B pistol (1).
FEMD4M	Item 5 was identified as having been fired in the same firearm as the known Item 1 cartridge cases based on sufficient agreement of individual characteristics seen in breechface marks and agreement of all discernible class characteristics. Items 2, 3 and 4 were identified as having been fired in the same unknown firearm based on sufficient agreement of individual characteristics seen in breechface marks and agreement of all discernible class characteristics.
FGEHQT	Items 1, 2, 3, 4, and 5: A microscopic comparison was conducted between Test cartridge cases (A through C) that were fired in Item 1 and Items 2, 3, 4, and 5. The examinations determined that Item 5 was fired in the firearm, Item 1 due to a sufficient agreement between the firing pin and breech face markings. The examinations determined Items 2, 3, and 4 were not fired in the firearm, Item 1 due to a disagreement of individual characteristics. The examinations determined that Items 2, 3, and 4 were fired in the same firearm due to a sufficient agreement between the firing pin and breech face markings. Disposition: Items 1 (A through C), 2, 3, 4, and 5 will be forwarded to the Property Custody Section.
FJ24DN	Item 001-05 was fired in the same firearm as Item 001-01 (identification). This is also the opinion of Firearms Examiner (Name). Items 001-02 -- 001-04 were not fired in the same firearm as Items 001-01 and 001-05 (elimination). This is also the opinion of Firearms Examiner (Name). Items 001-02 -- 001-04 were fired in the same firearm (identification). This is also the opinion of Firearms Examiner (Name). Items 001-02 -- 001-04 could have been fired in a 40 S&W firearm produced or marketed by manufacturers listed in Appendix 01. [Appendix included in Table 3: Additional Comments]

TABLE 2

WebCode	Conclusions
FJMFEH	Items 1, 2, 3, 4 and 5 were microscopically compared to each other. Item 5 was identified as having been fired in the Item 1 (known) firearm. Items 2, 3, and 4 were identified as having been fired in the same unknown firearm as each other. They were eliminated as having fired in the Item 1 (known) firearm due to a significant disagreement of class and individual characteristics.
FQGDEK	ITEM: SUMMARY OF RESULTS AND INTERPRETATIONS: 1.1-1.5 : The expended casings were originally components of PMC brand .40 S&W caliber cartridges. A Microscopic examination and comparison revealed the following: Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Item 1.5 are identified as having been fired in the same firearm as Item 1.1. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items 1.2, 1.3 & 1.4 are identified as having been fired in a second unknown firearm.
FR8N7D	The impressed marks on the firing pin impressions of Items 1appeared to be similar in general class characteristics with item 5 . The striations on the breech face aligned when placed side by side on the comparison macroscope suggesting a common origin The striations on Items 2,3 and 4 did not align with any of the striation on items 1 when placed side by side on a comparison macroscope thereby excluding as having a common origin with those on items 1
FVHP4C	1. Exhibit 1 consists of three .40 S&W fired cartridge cases. 2. Exhibits 2 through 5 each consist of one .40 S&W fired cartridge cases. 3. Exhibits 1 through 5 are suitable for microscopic comparison. Exhibits were compared to each other. 4. Exhibit 5 was fired in the same firearm as Exhibit 1 based on sufficient agreement of individual characteristics. 5. Exhibits 2, 3 and 4 were fired in the same firearm based on sufficient agreement of individual characteristics. 6. Exhibits 2, 3, and 4 were not fired in the same firearm as Exhibit 1 and 5 based on sufficient agreement of class characteristics and sufficient disagreement of individual characteristics. Technical Notes: Class characteristics are defined as measurable features of a firearm/tool which indicate a restricted group source. They result from design features and are determined prior to manufacture of the firearm/tool. Individual characteristics are defined as marks produced by the random imperfections or irregularities of firearm/tool surfaces. These random imperfections or irregularities are produced incidental to manufacture and/or caused by use, corrosion, or damage, and are unique to that specific tool. Any conclusions indicating that a toolmark was made by a specific firearm/tool are not to the absolute exclusion of all other firearms/tools because it is not feasible to examine all possible firearms/tools. However, observing this amount of agreement from a different source is considered extremely remote.
FZ8WA6	Item 001-01 are three test-fired cartridge cases reportedly fired from a CZ brand, model 40B, 40 S&W caliber firearm. Items 001-02 through 001-05 are four fired PMC brand 40 S&W caliber cartridge cases reportedly recovered from the scene. I microscopically compared one of the test-fired cartridge cases from Item 001-01 to Items 001-02 through 001-05. I observed differences in some of their class characteristics and individual characteristics to conclude that Items 001-02 through 001-04 were not fired in the same firearm that produced the test fires, Item 001-01. I then microscopically compared Items 001-02 through 001-04 to each other. I observed agreement of all discernable class characteristics with sufficient agreement of their individual characteristics to conclude that Items 001-02 through 001-04 were fired in a single firearm. I microscopically compared one of the test-fired cartridge cases from Item 001-01 to Item 001-05. I observed agreement of all discernable class characteristics with sufficient agreement of their individual characteristics to conclude that Item 001-05 was fired in the same firearm that produced the test fires, Item 001-01.

TABLE 2

WebCode	Conclusions
G22H8M	After a microscopic examination, the fired cartridge case (Item 5) was identified as having been fired in the suspect's CZ 40B 40 S&W caliber firearm based on sufficient agreement of individual characteristics in the breechface and firing pin impression marks. Three fired cartridge cases (Items 2, 3, and 4) were identified as having been fired in the same, at this time unknown, firearm based on sufficient agreement of individual characteristics in the breechface and firing pin impression marks.
G2E7P3	The Item 5 fired cartridge case was fired in the same firearm that fired the Items 1.1, 1.2, and 1.3 test fired cartridge cases, indicated by the submitting agency as being a CZ model 40B. This identification is based on sufficient agreement of the combination of individual characteristics and all discernible class characteristics. The Items 2, 3, and 4 fired cartridge cases were fired in the same unknown firearm. These identifications are based on sufficient agreement of the combination of individual characteristics and all discernible class characteristics. The Items 2, 3, and 4 fired cartridge cases were not fired in the same firearm that fired the Items 1.1, 1.2, 1.3, and 5 fired cartridge cases. These eliminations are based on differences in class characteristics (different firing pin textures and different shape firing pin aperture flowback).
G42PDT	Microscopic examination and comparison of the test fired 40 S&W caliber cartridge cases Item 1.1 to the one (1) fired 40 S&W caliber cartridge case Item 1.5 reveals agreement of all class characteristics along with corresponding individual characteristics establishing that Item 1.5 and was fired by the same firearm that fired the cartridge cases in Item 1.1. (Identification) Microscopic examination and comparison of the test fired 40 S&W caliber cartridge cases Item 1.1 to the three (3) fired 40 S&W caliber cartridge case Item 1.2, 1.3 and 1.4 reveals disagreement of individual characteristics establishing that Items 1.2, 1.3 and 1.4 were not fired by the same firearm that fired the cartridge cases in Item 1.1. (Elimination) Microscopic examination and comparison of the three (3) fired 40 S&W caliber cartridge case Items 1.2, 1.3 and 1.4 to each other reveals agreement of all class characteristics along with corresponding individual characteristics establishing that the three (3) fired 40 S&W caliber cartridge case Items 1.2, 1.3 and 1.4 were fired by the same unknown 40 caliber firearm. (Identification)
G4RHPR	Examinations showed Item 5 (T-4) was discharged within the same firearm as represented by Item 1 (TF-1 through TF-3). Examinations showed Items 2 (T-1) through 4 (T-3) were not discharged within the same firearm as represented by Item 1 (TF-1 through TF-3).
G7P2CY	After microscopic comparison, it was determined that Item #5 was fired from the same firearm as Item #1 (CZ model 40B, 40 S&W semi-auto pistol) based on sufficient agreement of class and individual characteristics of the breech face marks. After microscopic comparison, it was determined that Items# 2, 3, and 4 were not fired from the same firearm as Item #1 (CZ model 40B, 40 S&W semi-auto pistol), based on differences of individual characteristics of the firing pin marks and the breech face marks. After microscopic comparison, it was determined that Items# 2, 3, and 4 were fired from the same unrecovered 40 S&W caliber firearm based on sufficient agreement of class and individual characteristics of the breech face marks.
G92VAC	The cartridge case in exhibit F1 Item 5 was examined and found upon microscopic comparison to have been discharged in the .40 S&W pistol that provided the test fired cartridge cases in exhibit F1 Item 1. This identification is based on an agreement of both class and individual characteristics. The cartridge cases in exhibit F1 Items 2, 3, and 4 were examined and found upon microscopic comparison to have been discharged in a second .40 S&W pistol. These identifications are based on agreement of both class and individual characteristics. Exhibit F1 Items 2, 3, and 4 were not fired in the .40 S&W pistol that provided the test fires in exhibit F1

TABLE 2

WebCode	Conclusions
	Item 1 based on differences in class characteristics.
GCGTRD	Comparison microscope examinations were conducted on the evidence submitted. The findings of this examiner are the following: Exhibits 1.2 (Item 2) through 1.4 (Item 4) were fired in the same unknown .40 S&W caliber firearm based on sufficient agreement of individual characteristics. Exhibit 1.5 (Item 5) was fired in the same firearm as exhibit 1.1 (Item 1, knowns) based on sufficient agreement of individual characteristics.
GN9UD9	The Item 2, 3 and 4 cartridge cases are all identified as having been fired in the same unknown firearm. The Item 5 cartridge case is identified as having been fired in the same firearm that fired the Item 1 cartridge cases. The Item 2, 3 and 4 cartridge cases are eliminated as having been fired in the same firearm that fired the Item 1 and 5 cartridge cases.
GQLHZU	A microscopic comparison was conducted between Test cartridge case #1 through #3, Item #1 and Items #2, #3, #4 and #5. The examinations determined that Item #5 was fired from the same firearm as Item #1 due to a sufficient agreement firing pin and breech face impressions. The examinations determined that Items #2, #3 and #4 were not fired in the same firearm as Item #1 due to a disagreement of firing pin and breech face impressions. A microscopic comparison was conducted between Items #2, #3 and #4. The examinations determined that Items #2, #3 and #4 were fired in the same firearm due to a sufficient agreement between firing pin and breech face impressions.
GQMPBF	Exhibit 5 (fired .40 S&W casing) was identified as having been fired in the same firearm as exhibit 1 (test fired casings). Exhibits 2 through 4 (fired .40 S&W casings) were identified as having been fired in a second .40 S&W firearm. Suspect weapons are unknown at this time; however, any suspect weapon should be submitted for examination.
GV8JP9	RESULTS: CARTRIDGE CASES: Item 5 The cartridge case was Identified to the Item 1 test fires. Items 2, 3 and 4 The cartridge cases were Eliminated to the Item 1 test fires. REMARKS: The method of testing for ammunition components (that have results that fall into the range of conclusions defined below) included physical examination and microscopic comparison. Elimination results that are reported as based on a difference in class characteristics include only physical examination. Identified: Agreement of all discernible class characteristics and sufficient agreement of individual characteristics where the extent of agreement leads to the conclusion that the items were fired in/from the same firearm. Inconclusive: Agreement of all discernible class characteristics without significant agreement or disagreement of individual characteristics; therefore, the items could neither be identified nor eliminated as having been fired in/from the same firearm. Eliminated: Significant disagreement of discernible class characteristics and/or individual characteristics leading to the conclusion that the items were not fired in/from the same firearm.
GVXA7M	Items 001-02 through 001-04 were identified as having been fired by the same unknown firearm based on the agreement of class characteristics and individual characteristics observed in the breechface impression marks. Items 001-02 through 001-04 were eliminated as having been fired by the same firearm that fired Item 001-01 based on disagreement of individual characteristics observed in the breechface impression marks and the firing pin impression marks. Item 001-05 was identified as having been fired by the same firearm that fired Item 001-01 based on the agreement of class characteristics and individual characteristics observed in the breechface impression marks and firing pin impression marks.
GYFZJP	The marks on the three reference cartridge cases left by the suspected firearm (CZ 40B Cal. 40 S&W) have been observed and compared. Similitudes have been observed mainly on the firing pin mark and the breech face mark. The questioned cartridge cases (Item 2,3,4,5) have been

TABLE 2

WebCode	Conclusions
	compared to the references (Item 1). The class characteristics didn't show clear discrepancy. Therefore, each mark has been compared at macroscopical level. No particular similitude has been observed between the questioned cartridge cases Item 2,3,4 and the references. Several differences have been highlighted in the firing pin marks, the firing pin aperture and the breech face marks comparison. To the other hand, the comparison between the Item 5 and the references highlighted a high level of correspondance, mainly between the firing pin marks, the firing pin aperture and the breech face marks.These observations support extremely strongly the hypothesis of a common source between the observed marks on the Item 5 and the reference samples.
H6HYKL	Item 5 was identified as having been fired by the firearm that fired Item 1 based on the agreement of class and individual characteristics. Items 2, 3 and 4 were identified as having been fired by the same firearm based on the agreement of class and individual characteristics. Items 2, 3 and 4 were not fired by the firearm that fired Items 1 and 5 based on differences in class characteristics.
H6WKT3	Items – Description/Visual Examination: Item 1: Three (3) reported test fired cartridge cases, 40 caliber. Items 2 thru 5: Four (4) fired 40 caliber cartridge cases. Microscopic Comparison Conclusions: Identification: Based upon the reproducibility of class characteristics and microscopic individual characteristics, the following identifications were made: Lab Item Evidence Type Conclusion 5 (1) cartridge case Fired in the same firearm as Item 1 2, 3 & 4 (4) cartridge cases Fired in the same firearm Elimination Based upon the difference in individual characteristics, the following eliminations were made: Lab Item Evidence Type Conclusion
HDRZQZ	The fired 40 S&W caliber cartridge case, item 5, was identified as having been fired in the firearm used to produce the three test fired 40 S&W caliber cartridge cases, item 1. The three fired 40 S&W caliber cartridge cases, items 2 through 4, were identified as having been fired in a second firearm.
HMDVCF	By means of microscopic comparison, the cartridge cases, (items 1 and 5) were identified as having been fired from the same firearm. This qualitative Identification is based on the agreement of all discernible class and sufficient agreement of individual characteristics. By means of microscopic comparison, the cartridge cases, (items 2, 3 and 4) were all identified as having been fired from a second firearm. This qualitative Identification is based on the agreement of all discernible class and sufficient agreement of individual characteristics.
HYCCMQ	The cartridge case Item 5 was dischardged from the suspect's firearm (Item 1). The suspect's firearm (Item 1) didn't dischardge three cartridge cases Item 2, Item 3 and Item 4. Three cartridge cases Item 2, Item 3 and Item 4 were dischardged from same firearm.
HYCUJ8	Exhibit 5 (fired .40 S&W casing) was identified as having been fired in the same firearm as the exhibit 1 (test fired casings). Exhibits 2 through 4 (fired .40 S&W casings) were identified as having been fired in a second .40 S&W firearm. Suspect weapons are unknown at this time; however, any suspect weapon should be submitted for examination.
J3PKC3	SUBMISSION 001: The pistol was identified to the submission 005 cartridge case. SUBMISSION 002, 003, and 004: These cartridge cases were identified to an unsubmitted firearm. These cartridge cases were eliminated from the submission 001 pistol.
J3PMYL	Lab Items #1 (three test-fired PMC .40 S&W cartridge cases), #2 (one PMC .40 S&W fired cartridge case), #3 (one PMC .40 S&W fired cartridge case), #4 (one PMC .40 S&W fired cartridge case), and #5 (one PMC .40 S&W fired cartridge case) were examined and microscopically compared on 7/6/2023. Based on agreement of all discernable class characteristics and sufficient agreement of individual characteristics, Lab Item #5 (fired

TABLE 2

WebCode	Conclusions
	cartridge case) was positively identified as having been fired in the same firearm as Lab Item #1 (three test-fired PMC .40 S&W cartridge cases). Based on agreement of all discernable class characteristics and sufficient agreement of individual characteristics, Lab Items #2, #3, and #4 (three PMC .40 S&W fired cartridge cases) were positively identified as having been fired in the same firearm. No firearm was submitted. Based on disagreement of class characteristics, Lab Items #2, #3, and #4 (three PMC .40 S&W fired cartridge cases) were eliminated as having been fired in the same firearm as Lab Items #1 (test-fired cartridge cases) and #5 (fired cartridge case).
J68VXK	The item 1A, 1B, 1C, and 5 cartridge cases are identified as having been fired in the same firearm. The item 2, 3, and 4 cartridge cases are eliminated as having been fired in the same firearm as the item 1A, 1B, and 1C cartridge cases. The item 2, 3, and 4 cartridge cases are identified as having been fired in an unknown firearm.
J6UHX9	A comparative microscopic examination between the exhibit fired cartridge case, (Item 5), and the test fired cartridge cases, (Item 1), revealed that they had been discharged in the same firearm. A comparative microscopic examination between the exhibit fired cartridge cases, (Items 2, 3 and 4), revealed that they had been discharged in a second firearm.
J7GYEP	The test fired cartridge cases contained in Item 1 were microscopically compared to the cartridge cases identified above as Items 2, 3, 4, and 5 with the following results: Item 5 was fired in the same firearm that generated the test fired cartridge cases contained in Item 1 based on agreement of all discernable class characteristics and individual characteristic agreement. Items 2, 3, and 4 were eliminated from having been firearm by the same firearm that fired the test fired cartridge cases contained in Item 1 based on class characteristic differences and a lack of individual detail agreement. Items 2, 3, and 4 were microscopically intercompared. The comparisons disclosed that Items 2, 3, and 4 were fired in the same unknown firearm based on agreement of all discernable class characteristics and individual characteristic agreement.
JAJRRM	Item 5 was identified microscopically as having been fired in the same firearm that reportedly fired Items 1A - 1C based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 2 - 4 were identified microscopically as having been fired in the same unknown firearm based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 2 - 4 were microscopically eliminated as having been fired in the same firearm that reportedly fired Items 1A - 1C, due to disagreement of discernible individual characteristics. Items 1A and 3 were imaged into the Integrated Ballistics Identification System (IBIS) / BrassTRAX database and any potential leads made from these entries will result in a notification. All evidence items are being retuned.
JD2X34	Property Items 1A and 5 The cartridge cases were Identified to each other. Property Items 2, 3, and 4 The cartridge cases were Identified to each other. The cartridge cases were Eliminated to the Property Item 1A, 1B, 1C, and 5 cartridge cases. Property Items 1B and 1C The cartridge cases were not further examined.
JEWEK7	The item 5 cartridge case is identified as having been fired in the same firearm that fired the item 1A, 1B and 1C cartridge cases. The item 2, 3 and 4 cartridge cases are eliminated as having been fired in the same firearm that fired the item 1A, 1B, 1C and the item 5 cartridge cases. The item 2, 3 and 4 cartridge cases are identified as having been fired in a second unknown firearm.
JGXNDU	After examining Items# 2, 3, 4, and 5, I certify that this evidence is AMMUNITION as defined by the [State General Law and Chapter/Section]. After microscopic comparison, it was determined that Item# 5 was fired in Item# 1 based on sufficient agreement of class and

TABLE 2

WebCode	Conclusions
	individual characteristics of the breech face marks. After microscopic comparison, it was determined that Items# 2, 3 and 4 were fired in the same firearm (unrecovered 40 S&W caliber firearm) based on sufficient agreement of class and individual characteristics of the breech face marks.
JJRWPP	Item 5 was identified as having been fired in the same firearm as Item 1 test fired cartridge cases. Items 2, 3, and 4 were identified as having been fired in the same unknown firearm.
JT4TX3	The Item 5 cartridge case was fired from the Item 1 pistol. The Items 2 to 4 cartridge cases were fired from the same unknown firearm.
JUKV9B	Item1, Test fired cartridge cases From CZ 40B pistol were microscopically compared to items 2, 3, 4, and 5. Item1 was matched to item 5. Items 2, 3 and 4 did not match item 1. Items 2, 3 and 4 matched each other and were fired in a different gun. Item 5 was fired in the recovered CZ 40B, the other cartridges were fired in an additional different unknown gun.
JZQN37	Items 1A & 5: The cartridge cases were Identified to each other. The cartridge cases were Eliminated to Items 2, 3, and 4, based on a difference in class characteristics. Items 1B & 1C: The cartridge cases were not further examined. Items 2, 3, & 4: The cartridge cases were Identified to each other.
JZUGCU	[No Conclusions Reported.]
K2Y2K8	On examination, I found: i) the characteristic marks on the questioned expended cartridge case (Item 5) to be similar to the characteristic marks on the known expended cartridge cases (Item 1). ii) the characteristic marks on the questioned expended cartridge cases (Item 2), (Item 3) and (Item 4) to be dissimilar to the characteristic marks on the known expended cartridge cases (Item 1). Therefore, I am of the opinion that: i) the questioned expended cartridge case (Item 5) was fired from the same firearm as the known expended cartridge cases (Item 1). ii) the questioned expended cartridge cases (Item 2), (Item 3) and (Item 4) were not fired from the same firearm as the known expended cartridge cases (Item 1).
K3BVZ8	The hypothesis that expended cartridge cases items 1, and item 5 were discharged from the same firearm is very strongly supported.
K3ZF2J	Cartridge Case Analysis: Methodology: Physical (Visual Examination). Microscopy (Comparison Microscopy). Item 5, the cartridge case, was fired in the same firearm as Item 1, the test fired cartridge cases, based upon corresponding class and individual microscopic characteristics. Items 2, 3, and 4, the cartridge cases, were fired in the same firearm based upon corresponding class and individual microscopic characteristics. Items 2, 3, and 4, the cartridge cases, were not fired in the same firearm as Item 1, the test fired cartridge cases, and Item 5, the cartridge case, based upon different class and individual microscopic characteristics.
K8DQ8F	[No Conclusions Reported.]
KA3VZM	Item 5 was identified microscopically as having been fired in the same firearm that fired the test fires, Item 1, based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 2 - 4 were microscopically eliminated as having been fired in the same firearm that fired the test fires, Item 1, due to disagreement of individual characteristics. Items 2 - 4 were identified microscopically as having been fired in the same unknown firearm based on agreement of the combination of individual characteristics and all discernible class characteristics. Item 2 and the test fires, Item 1, were imaged into the Integrated Ballistics Identification System (IBIS) / BrassTRAX database and any future identification made from these entries will result in a notification. Test fires are being retained by the Firearms Identification Laboratory; all other items of evidence are being returned.

TABLE 2

WebCode	Conclusions
KCQGMH	Item 5 was fired in the same firearm as the item 1 test fires. Items 2 through 4 were fired in a second firearm.
KLAQX6	Items 1A-1C, 2, 3, 4, & 5: Item 1A was Identified to Item 5. Items 2, 3, and 4 were Identified to each other. They were Eliminated to Items 1A-1C and Item 5.
KQ2KQJ	The questioned expended cartridge case Item 5 was fired by the same firearm as the known expended cartridge cases discharged from the suspect's firearm (Item 1); The questioned expended cartridge case Item 2, Item 3 and Item 4 were fired by a second unknown firearm.
KQU49Y	Items 2, 3, and 4 (fired cartridge cases). Microscopic comparison of these cartridge cases and a test-fired cartridge case from the CZ pistol revealed significant differences in class of firearm-produced marks. These cartridge cases were not fired in the CZ pistol, Item 1. Microscopic comparison of these cartridge cases revealed that they have the same class of firearm-produced marks and sufficient corresponding individual marks to conclude that Items 2 through 4 were fired in the same unknown firearm. Item 5 (fired cartridge case). Microscopic comparison of this cartridge case and a test-fired cartridge case from the CZ pistol revealed that they have the same class of firearm-produced marks and sufficient corresponding individual marks to conclude that this cartridge case, Item 5, was fired in the CZ pistol.
KUAXMB	Exhibit 5 (fired .40 S&W casing) was identified as having been fired in the same .40 S&W firearm as exhibit 1 (test fired casings). Exhibits 2 through 4 (fired .40 S&W casings) were identified as having been fired in a second.40 S&W firearm. Suspect weapons are unknown at this time; however, any suspect weapon should be submitted to the laboratory for analysis.
KYM743	Findings: Comparison microscope examinations were conducted on the evidence listed above. The findings of this examiner are the following: 1: Exhibit 1.5 was fired by Exhibit 1.1 based on sufficient agreement of individual characteristics. 2: Exhibits 1.2, 1.3, and 1.4 were fired by an unknown .40 S&W caliber firearm based on sufficient agreement of individual characteristics.
L4CDAV	Items 1 through 5 were intercompared to each other using a comparison microscope. Based on these comparisons, it is my opinion that item 5 was fired in the same firearm that produced the test-fired cartridge cases in item 1. It is also my opinion that items 2 through 4 were fired in a different firearm that produced the test-fired cartridge cases in item 1. It is my opinion that items 2, 3, and 4 were fired in the same unknown firearm.
LAFGVM	The Item 5 cartridge case was identified, within the limits of practical certainty1, as having been fired by the CZ model 40B, semi-automatic pistol, which generated the Item 1 test fired cartridge cases (See Attribution). The Item 2 through 4 cartridge cases were identified, within the limits of practical certainty1, as having been fired by the same firearm, but are excluded as having been fired by the CZ model 40B, semi-automatic pistol. Two (2) firearms are represented by the Item 2 through 5 cartridge cases.
LP8QRK	Item 5 was fired in the same firearm as Item 1 (identification). This is also the opinion of Firearms Examiner (Name). Items 2 - 4 were fired in the same firearm (identification). This is also the opinion of Firearms Examiner (Name). Items 2 - 4 were not fired in the same firearm as Item 1 (elimination). This is also the opinion of Firearms Examiner (Name).
LU3KPL	Microscopic examination and comparison of the PMC cartridge case (Item 5) revealed sufficient agreement of individual characteristics to conclude that it was identified as having been fired in the same firearm as the test-fired PMC cartridge cases (Items 1, 1A, 1B). Microscopic examination and comparison of the PMC cartridge cases (Items 2, 3, 4) revealed they can be eliminated as having been fired in the same firearm as the test-fired PMC cartridge cases (Items 1, 1A, 1B) and the PMC cartridge case (Item 5) based on differences in class and

TABLE 2

WebCode	Conclusions
	individual characteristics. Microscopic examination and comparison of the PMC cartridge cases (Items 2, 3, 4) revealed sufficient agreement of individual characteristics to conclude that they were identified as having been fired in the same firearm.
LYVMPF	Item 5 was fired in the same firearm as the item 1 test fires. Items 2, 3 and 4 were fired in a second firearm.
M3JC64	The reference fired cartridge cases, specimen #1, fired in the Taurus pistol, were microscopically compared to the .40 S&W caliber fired cartridge cases, specimens #2 through #5. The following was determined: Specimen #5 was fired in the same Taurus pistol as the reference fired cartridge cases, specimen #1. Specimens #2, #3, and #4 were fired in the same weapon; however, they were not fired in the same Taurus pistol as the reference fired cartridge cases, specimen #1, due to differences in the aperture shapes and the markings from the breech faces and firing pins.
M6AHJA	Item #5 was fired from the from the suspect's firearm. Items #2, #3, #4 were fired from the same firearm, but were not fired from the suspect's firearm.
M6JMPT	1. The three 40 S&W cartridge cases (Item 01-01) were identified as having been fired in a single firearm; presumably the CZ pistol listed in the given scenario. 2. The three 40 S&W cartridge cases (Items 01-02 – 01-04) were eliminated as having been fired in the CZ pistol; however, they were identified as having been fired in a single unknown firearm. 3. The 40 S&W cartridge case (Item 01-05) was identified as having been fired in the CZ pistol.
MFXLFU	Before examination the cartridge cases recovered from a crime scene were marked TH1 (Item 2), TH2 (Item 3), TH3 (Item 4) and TH4 (Item 5). The cartridge cases collected after test firing the suspect´s handgun were marked VH1, VH2 and VH3. These cartridge cases were compared using a Leica FSC comparison Microscope. The cartridge cases bear appropriate marks that make them suitable for comparative analysis. Identification of the firearm used, based on these marks, appears to be possible. Based on the observed differences in the individual characteristics of TH1, TH2, TH3 compared to VG1, VG2 and VG3 it is concluded that none of these questioned cartridge cases were fired with the suspect´s firearm. Based on the observed similarities in the individual characteristics of TH4 compared to VG1, VG2 und VG3 it is concludes that this cartridge case was fired with the suspects firearm.
MGQ6WG	Acording to the comparison of the elements we have the following conclusions: A- ITEM 5 cartridge case has been fired with the same weapon as ITEM 1 cartridge case (recovered firearm CZ Model 40B). B- ITEM 2, ITEM 3 and ITEM 4 have been fired with a different weapon than the fired ITEM 1 and ITEM 5.
MHZKBU	I microscopically compared Item 1 (test fired cartridge cases) to Items 2, 3, 4, and 5. I identified Item 5 as being fired in Item 1 based on sufficient agreement of individual characteristics within the breech face , firing pin impression and ejector marks. Items 2, 3, and 4 can be eliminated as being fired in Item 1 due to significant disagreement of individual characteristics within the breech face, firing pin impression and ejector marks. I microscopically compared Items 2, 3, and 4 to each other. I identified Items 2, 3, and 4 as being fired in a second firearm based on sufficient agreement of individual characteristics within the breech face and firing pin impression marks.
MR9KZJ	First: The questioned cartridges case, in this study identified as items 2, 3 and 4, whose caliber is .40 S&W were fired by the same firearm, but a different one than the one that fired the questioned cartridge case identified as item 5. Second: The questioned cartridge case identified as item 5 with a .40 S&W caliber was fired by a .40 S&W pistol, made by CZ and with model 40B, from which the know cartridges case identified as item 1 were obtained.

TABLE 2

WebCode	Conclusions
	Third: It was possible to identify just two firearms as the ones that fired the questioned cartridges cases.
MVKUQR	There was sufficient agreement of class and individual characteristics to determine that the cartridge case, Item 5 and the test fires, Item 1 had been discharged in the same firearm. There was also sufficient agreement of class and individual characteristics to determine that the cartridge cases, Item 2, 3, and 4 been discharged in the same firearm, but not the same firearm as the cartridge cases Items 1 and 5.
MZL3JN	Item 1E (fired cartridge case, CTS Item 5) is identified as having been fired in the same firearm as Items 1A1 through 1A3 (known fired cartridge cases, CTS Item 1). Items 1B through 1D (fired cartridge cases, CTS Items 2, 3, and 4) are identified as having been fired in the same firearm. Items 1B through 1D (fired cartridge cases, CTS Items 2, 3, and 4) are eliminated as having been fired in the same firearm as Items 1A1 through 1A3 (known fired cartridge cases, CTS Item 1). There are differences in class characteristics (firing pin machining marks).
N822TT	The submitted fired cartridge cases (Items 1-1, 1-2, 1-3, and 5) were identified as having been fired in the same unknown firearm. Due to commonly seen class characteristics, a manufacture could not be determined. The submitted fired cartridge cases (Items 2, 3, and 4) were identified as having been fired in the same unknown firearm. Due to commonly seen class characteristics, a manufacture could not be determined. The submitted fired cartridge cases (Items 2, 3, and 4) were eliminated as having been fired in the same firearm as the fired cartridge cases (Items 1-1, 1-2, 1-3, and 5) due to differences in class characteristics.
NAKXNR	Item 5 was fired in the CZ pistol. Items 2, 3, and 4 were not fired in the CZ pistol. It is highly likely that items 2, 3, and 4 were fired in the same gun.
NLWVGE	Cartridge case Q4 was identified as having been fired with the K1 firearm. Cartridge cases Q1-Q3 were identified as having been fired with the same unknown firearm. Cartridge cases Q1-Q3 were excluded as having been fired with K1 based on sufficient disagreement of class and individual characteristics.
NN3JB7	The expended cartridge Item 5 has been fired in the seized CZ 40B (Item 1). Moreover, the three expended cartridges labbeled as Item 2, Item 3 and Item 4 have been fired in a same weapon, different from the seized weapon. In conclusion, the 4 expended cartridges recovered from the crime scene have been discharged in 2 different weapons : the seized CZ 40B (Item 5). a second firearm (Item 2, Item 3, Item 4)
NV9MM6	Comparisons performed between the test fired cartridge cases (Item 1) and Item 5 resulted in an identification. The spent cartridge case (Item 5) has been identified as having been fired in the listed firearm. Comparisons performed between the test fired cartridge cases (Item 1) and Item 2, Item 3 and Item 4 resulted in an exclusion. The spent cartridge cases (Items 2, 3 and 4) were NOT fired in the listed firearm. Comparisons performed between Item 2, Item 3 and Item 4 resulted in an identification.
PAXMR4	Based on the agreement of class characteristics, the Item 5 cartridge case was microscopically compared to the Item 1 test fired exemplars produced by the recovered CZ model 40B pistol. This cartridge case was identified as having been fired in the recovered CZ pistol. Based on the agreement of class characteristics, Items 2, 3 and 4 were microscopically compared to each other and to the Item 1 test fired exemplars and Item 5. Items 2, 3 and 4 were eliminated as having been fired from the recovered CZ pistol based on class characteristic differences in the firing pin impression. However, Items 2, 3 and 4 were identified as having been fired in the same unknown 40 S&W caliber firearm. Any 40 S&W caliber firearms that become suspect during the course of this investigation should be submitted for comparison purposes. The

TABLE 2

WebCode	Conclusions
	significance of these cartridge case identifications were made to the practical, not absolute, exclusion of all other firearms.
PF69J8	In my opinion, a microscopical comparison of firing marks has shown there is sufficient agreement of class and individual characteristic markings to conclusively determine that the cartridge case, item 5, was fired in the same firearm as the cartridge cases in item 1. In my opinion, a microscopical comparison of firing marks has shown there is some agreement of class characteristic markings, but significant disagreement of individual characteristic markings, therefore the cartridge cases, items 2, 3 and 4 were not fired in the same firearm as the cartridge cases in item 1.
PJB7CU	The Item 1 through Item 5 40 S&W caliber fired cartridge cases were examined and each determined to consist of a brass case, brass primer, and marketed by Precision Made Cartridges (Eldorado Cartridge Corporation, PMC headstamp). The Item 5 fired cartridge case was microscopically compared to test fired exemplars from Item 1 based on the agreement of class characteristics. The fired cartridge case was identified as having been fired by the CZ pistol due to sufficient agreement of individual characteristics. The Item 2 through Item 4 fired cartridge cases were microscopically compared to each other based on the agreement of class characteristics. The three fired cartridge cases were identified as having been fired by the same unknown firearm due to sufficient agreement of individual characteristics. The significance of these identifications is made to the practical, not absolute, exclusion of all other firearms. Based on differences in class characteristics, the Item 2 through Item 4 fired cartridge cases were eliminated as having been fired by the Item 1 CZ pistol.
PJVAXU	The fired cartridge cases in Items 1(a-c) and 5 were identified as having been fired in the same firearm. The fired cartridge cases in items 2, 3, and 4 were all identified as having been fired in the same firearm; however, they were excluded as having been fired in the same firearm that fired Items 1(a-c) and 5. Identification is the strongest level of positive association.
PTGYRF	Item 5 (a 40 S&W caliber cartridge case) and Item 1 (three 40 S&W caliber cartridge cases said to be test fired in a CZ Model 40B 40 S&W caliber firearm) were identified* as having been fired by the same firearm. Items 2 through 4 (three 40 S&W caliber cartridge cases) were fired by a different firearm than Item 1. Items 2 through 4 were identified* as having been fired by the same firearm. *Source determination is reached when the discernible class and individual characteristics have corresponding detail and the examiner would not expect to see the same arrangement of details repeated in another source.
PYMUCF	Item 1 - Three (3) fired .40 S&W caliber cartridge cases bearing the PMC headstamp (discharged from the suspect's weapon) (1). Item 2 - One (1) fired cartridge case (2). Item 3 - One (1) fired cartridge case (3). Item 4 - One (1) fired cartridge case (4). Item 5 - One (1) fired cartridge case (5). The submitted specimens marked as Items 2 through 5 were examined and identified as four (4) fired .40 S&W caliber cartridge cases bearing the PMC headstamp. Items 1 through 5 were microscopically intercompared. As a result of microscopic comparison, it was concluded that Item 5 was identified as having been fired in the same firearm that fired Item 1. Items 2, 3, and 4 were identified as having been fired in the same unknown firearm. Items 2, 3, and 4 were eliminated as having been fired in the same firearm that fired Items 1 and 5 due to significant disagreement of class and individual characteristics.
Q7RL3Q	One of the four 40 S&W cartridge cases (Item 5) was fired in the same firearm as the three 40 S&W cartridge cases (Item 1) reportedly fired in the suspect's pistol. The remaining 40 S&W cartridge cases (Items 2 - 4) were fired in a second firearm.
Q8GZ6G	The submitted specimens marked as Items 2-5 were examined and identified as four (4) fired

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WebCode	Conclusions
	.40 Smith & Wesson caliber cartridge cases bearing the PMC headstamp. Items 2-5 were microscopically inter-compared and compared to Item 1 sample cartridge cases. As a result of microscopic comparison, it was concluded that Items 2-4 were identified as having been fired in the same unknown firearm. Item 5 was identified as having been fired in the same firearm that fired Item 1 sample cartridge cases. Items 2-4 were eliminated as having been fired in the same firearm as Item 5 and Item 1 sample cartridge cases based on significant disagreement of individual characteristics.
QBDJQT	Item 1 consisted of three fired .40 S&W cartridge cases marketed by PMC. They were reportedly fired by a CZ 40B pistol. They were arbitrarily labeled as 1A, 1B, and 1C. The cartridge cases were microscopically intercompared and found to have sufficient reproducibility of individual detail. Item 2 was a fired .40 S&W cartridge case marketed by PMC. Item 3 was a fired .40 S&W cartridge case marketed by PMC. Item 4 was a fired .40 S&W cartridge case marketed by PMC. Item 5 was a fired .40 S&W cartridge case marketed by PMC. Items 1A and Item 5 were compared to each other using a comparison microscope. Corresponding class characteristics and individual detail sufficient for identification were observed. Item 5 was fired by the CZ 40B pistol. Items 2, 3, and 4 were compared to each other using a comparison microscope. Corresponding class characteristics and individual detail sufficient for identification were observed. Items 2, 3, and 4 were fired by the same firearm. Items 1A and 2 were compared to each other using a comparison microscope. Class characteristics corresponded; however, significant differences of individual detail were observed to conclude that Items 2, 3, and 4 were not fired by the CZ 40B pistol.
QDD66Y	Items 2,3,4 were eliminated to Item 1. They were identified to each other. Item 5 was identified to Item 1.
QDL24P	Item 1.1 consists of three fired PMC brand 40 S&W cartridge cases stated to have been fired by a CZ 40B 40 S&W firearm. Items 1.2, 1.3, 1.4 and 1.5 consist of four fired PMC brand 40 S&W cartridge cases. They were microscopically compared to Item 1.1 and to each other. Based on agreement of all discernable class characteristics and corresponding individual detail in the breech face, firing pin and firing pin drag marks, Item 1.5 was identified as having been fired by the same firearm that fired the cartridge cases from Item 1.1. Based on agreement of all discernable class characteristics and corresponding individual detail in the breech face and firing pin drag marks, Items 1.2, 1.3 and 1.4 were identified as having been fired by the same firearm. Based on individual differences in the breech face, firing pin and firing pin drag marks, they can be eliminated as having been fired by the same firearm that fired the cartridge cases from Item 1.1. Comments: The identification of a cartridge case(s) and/or bullet(s) is made to a practical, not absolute, exclusion of all other firearms. It is not possible to examine all firearms which is a prerequisite for absolute certainty. Sufficient agreement for an identification exists between firearm produced toolmarks when the likelihood another firearm could have fired the cartridge case(s) and or bullet(s) is so remote as to be considered a practical impossibility.
QFNT6B	There were no exclusionary differences in all discernible class characteristics and sufficient agreement of individual characteristics within the firing pin impression and breech face marks of the questioned cartridge case marked 'Item 5' and those of the test-fired cartridge cases, indicating that 'Item 5' was discharged in the same firearm that discharged 'Item 1'. There were sufficient disagreement of individual characteristics within the firing pin impressions and breech face marks of the three questioned cartridge cases marked 'Item 2', 'Item 3' and 'Item 4' as compared to those of the test-fired cartridge cases, indicating that these three questioned cartridge cases were not discharged in the same firearm that discharged 'Item 1'.
QHD7WU	1. Exhibit 1 contains three .40 S&W cartridge cases labeled as test standards from the

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	recovered CZ 40B pistol. 2. Exhibits 2 through 5 each contain one .40 S&W cartridge case. 3. Microscopic comparison of Exhibits 1 through 5 revealed the following: a. Exhibits 1 and 5 were fired from the same firearm based on sufficient agreement of class and individual characteristics. b. Exhibits 2, 3, and 4 were fired from the same firearm based on sufficient agreement of class and individual characteristics; however, they were not fired from the same firearm as Exhibits 1 and 5 based on sufficient disagreement of class and individual characteristics.
QKUAXQ	The test fired cartridge cases, item 1, and the discharged cartridge case, item 5, were discharged in the same firearm. The discharged cartridge cases, items 2, 3, and 4, were all discharged in a second firearm.
QRYECB	Expended cartridge cases (Items 2, 3, and 4) were not discharged from the same firearm as the known expended cartridge cases (Item 1). Expended cartridge case (Item 5) was discharged from the same firearm as the known expended cartridge cases (Item 1).
QTJZER	Results of Examinations: Item 1 through Item 5 are .40 S&W caliber cartridge cases that bear the headstamp of PMC ammunition. The Item 5 cartridge case was identified as having been fired in the same pistol that fired the Item 1 cartridge cases. The Item 2 through 4 cartridge cases were identified as having been fired in the same firearm. Due to differences in class characteristics, the Item 2 through 4 cartridge cases were excluded as having been fired in pistol that fired the Item 1 and Item 5 cartridge cases.
QYVNC3	I am of the opinion that the questioned cartridge case 5 could have been fired from the recovered suspect's firearm. Questioned cartridge cases 2, 3 and 4 though having a common origin, were probably not fired from the recovered firearm.
R8BCW2	Item 001-05 was identified as having been fired by the same firearm that fired Item 001-01 based on agreement of class characteristics and individual characteristics observed in both the breechface and firing pin impression marks. Items 001-02 through 001-04 were eliminated as having been fired from the same firearm that fired Item 001-01 based on disagreement of individual characteristics observed in the breechface impression marks. Items 001-02 through 001-04 were identified as having been fired by the same unknown firearm based on the agreement of class characteristics and individual characteristics observed in the breechface impression marks.
RCYZCF	Item 5 was discharged from the firearm A1, Cal .40 S&W pistol type, CZ 40B Items: 2, 3 y 4 were discharged by a firearm, pistol type, cal .40 S&W, different from suspected weapon in the facts: item 1
RKH3WN	The test fired cartridge case (Item 1A) and the fired cartridge case (Item 5) were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, the case (Item 5) is identified as having been fired in the same firearm as the test fired case (Item 1A). The test fired cartridge case (Item 1A) and the fired cartridge cases (Items 2, 3 & 4) were microscopically examined and compared. Based on the observed disagreement of their class characteristics, the cases (Items 2, 3 & 4) are eliminated as having been fired in the same firearm as the test fired case (Item 1A).
RRHF2Y	1. Examination of Exhibit 1 revealed three fired .40 caliber cartridge cases marketed by PMC. 2. Examination of Exhibits 2-5 revealed each contains one fired .40 caliber cartridge case marketed by PMC. 3. Microscopic comparison revealed Exhibits 1 and 5 were fired in the same firearm due to sufficient agreement of individual characteristics. 4. Microscopic comparison revealed Exhibits 2, 3, and 4 were fired in the same firearm due to sufficient

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WebCode	Conclusions
	agreement of individual characteristics. 5. Microscopic comparison revealed Exhibits 1 and 5 were not fired in the same firearm as Exhibits 2, 3, and 4 due to sufficient disagreement of individual characteristics.
RT6Q6Q	Part I: Examined three specimens marked #1-1, #1-2, and #1-3. They are 40 S&W caliber discharged cartridge cases, listed as test fires from a CZ model 40B, headstamped PMC. Examined the specimen marked #5. It is a 40 S&W caliber cartridge case, headstamped PMC. The cartridge case marked #5 was microscopically compared against the three cartridge cases marked #1-1, #1-2, and #1-3 and identified as having been discharged in the same firearm as the cartridge cases marked #1-1, #1-2, and #1-3. Part II: Examined the three specimens marked #2, #3, and #4. They are 40 S&W caliber discharged cartridge cases, headstamped PMC. The three cartridge cases marked #2, #3, and #4 were microscopically compared and identified as having been discharged in the same firearm. The three cartridge cases marked #2, #3, and #4 were microscopically compared to the cartridge cases marked #5, #1-1, #1-2, and #1-3 and eliminated as having been discharged in the same firearm as the cartridge cases marked #5, #1-1, #1-2, and #1-3.
RW4CQ3	The cartridge cases in Item #1 were inter-compared for comparison purposes. The Item #1 and #5 cartridge cases were fired in the same firearm. The Item #2, #3 and #4 cartridge cases were fired in a second firearm.
RX72PC	Item 5 was discharged within the same firearm as Item 1. Items 2, 3 and 4 were not discharged within the same firearm as Item 1.
RXMEA3	Item 5 was microscopically identified as having been fired in the firearm that fired Item 1. Items 2, 3, and 4 were all microscopically identified as having been fired in the same unknown firearm.
RYRBXQ	Items (#2~#5) were microscopicially examined to each other. Based on the comparentative examination, individual characteristics were observed and it was determined that: Item #5 was discharged from the same firearms as the known cases (Item #1), and the others (item #2~4) were not same.
RYZX9E	Items 1 and 5 : The cartridge cases were Identified as having been fired in a single firearm. Items 2, 3, and 4 : The cartridge cases were Identified as having been fired in a single firearm. They were Eliminated with respect to having been fired in the same firearm as the cartridge cases Items 1 and 5.
RZCKUZ	1. Examination of Exhibit 1 revealed three fired .40 S&W cartridge cases consistent with PMC marketing designated as test standards from a suspect weapon. 2. Examination of Exhibits 2, 3, 4, and 5 revealed each contains one fired .40 S&W cartridge case consistent with PMC marketing. 3. Examination of Exhibits 1 through 5 revealed the cartridge cases are suitable for microscopic comparison. a. Microscopic comparison revealed Exhibit 5 was fired from the same firearm as Exhibit 1 due to sufficient agreement of individual characteristics. b. Microscopic comparison revealed Exhibits 2, 3, and 4 were fired from the same firearm due to sufficient agreement of individual characteristics; however, they were not fired from the same firearm as Exhibit 1 due to sufficient disagreement of individual characteristics.
T2T74U	The submitted cartridge case (item 5) was fired in the suspect's CZ 40B firearm. The remaining cartridge cases (items 2, 3, and 4) were fired in a second firearm; however, they were not fired in the suspect's CZ 40B.
T6BYPU	The Item 5 fired cartridge case was fired in the Item 1 CZ pistol. The Items 2, 3, and 4 fired cartridge cases were fired in the same unknown firearm. They were not fired in the the Item 1

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	pistol.
T6JNX8	The (Item 1-5) One (1) .40 S&W caliber discharged cartridge casing WAS FIRED from the submitted .40 S&W caliber CZ Model 40B, that produced the test fires mentioned in (Item 1-1) A-C. "IDENTIFICATION"
T77U26	Item 005 was microscopically compared to the Item 001 cartridge cases. Item 005 was identified as having been fired in the same firearm that fired the Item 001 cartridge cases based on the correspondence of individual characteristics and all discernable class characteristics. Item 002 was microscopically compared to Items 003 and 004. Items 002 through 004 were identified as having been fired in the same unknown firearm based on the correspondence of individual characteristics and all discernable class characteristics. Items 001 and 005 were microscopically compared to Items 002 through 004. Items 002 through 004 were eliminated as having been fired in the same firearm that fired the Item 001 cartridge cases and Item 005 based on differences in individual characteristics.
TFAAZ3	Item 1 and Item 5: The Item 5 cartridge case was Identified to the Item 1B agency test fire. Items 2 through 4: The cartridge cases were Identified to each other. The cartridge cases were Eliminated to Item 1 agency test fires.
TFCRUE	CTS 5 cartridge case was fired by the firearm said to have created CTS 1 cartridge cases. All Items are suitable; however, case circumstances preclude entrance into the NIBIN database. CTS 2 through 4 cartridge cases were fired by a second firearm. These Items are consistent with being fired by a 40 S&W caliber firearm. All Items are suitable; however, case circumstances preclude entrance into the NIBIN database.
TJ2C3B	Comparative examinations of Item 1 (three known expended 40 S&W caliber cartridge cases discharged from the suspect's firearm) against Item 5 (one questioned expended 40 S&W caliber cartridge case) showed the presence of corresponding features. This means that Item 1 and Item 5 are consistent with having been fired in the same firearm. *Comparative examinations of Item 1 against Items 2-4 (three questioned expended 40 S&W caliber cartridge cases) showed the presence of different features. This means that Item 1 and Items 2-4 were not fired in the same firearm. Comparative examinations of Items 2-4 showed the presence of corresponding features. This means that Items 2-4 are consistent with having been fired in the same firearm.**Source identification is reached when the discernible class and individual characteristics have corresponding detail and the examiner would not expect to see the same arrangement of details repeated in another source.
TJ2KWF	One of the fired cartridge cases (1-05) was identified as having been fired in the same firearm as the three cartridge cases submitted as test fires (1-01) due to consistent and repeatable pattern areas of marks. Three of the fired cartridge cases (1-02, 1-03, and 1-04) were identified as having been fired in the same firearm due to consistent and repeatable pattern areas of marks; however, they were eliminated as having been fired in the same firearm as the cartridge cases submitted as test fires (1-01) due to differences in class characteristics.
TJTN44	Items 1, 5: Item 1 was Identified to the Item 5 cartridge case. Items 2, 3, 4: The cartridge cases were Identified to each other. The cartridge cases were Eliminated to the Item 1 and 5 cartridge cases.
TPZHF8	ITEM: SUMMARY OF RESULTS AND INTERPRETATIONS: 1.1 - 1.5: The expended casings were originally components of PMC brand .40 S&W caliber cartridges. A Microscopic examination and comparison revealed: Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Item 1.5 is identified as having been fired from the same firearm as test fires 1.1. (CZ Model:40B). Based on the

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	observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items 1.2, 1.3 and 1.4 are identified as having been fired from a second unknown firearm.
TRPPZ4	In my opinion item 5 was fired in the same gun as the test fired cartridge cases in item one (i.e. item 5 was fired in the suspect's gun) In my opinion items 2, 3, 4 were all fired in the same gun, which was a different gun to the suspect's gun (i.e. a different gun to item 1 and 5).
TRPRL2	The cartridge recovered from the crime scene marked with item 5, was fired from a CZ 40B, .40 caliber pistol, confiscated in the possession of a suspect who was located later that day.
TRU9YQ	The fired .40S&W caliber cartridge cases (Items 2, 3, 4 and 5) were examined and microscopically compared to the test fired cartridge cases from the CZ pistol (Item 1). The following was determined: 1. The fired .40S&W caliber cartridge case listed as Item 5 was fired in the CZ pistol. 2. The fired .40S&W caliber cartridge cases listed as Items 2, 3, and 4 were not fired in the CZ pistol. However, these three cartridge cases were all fired in the same unknown weapon capable of chambering and firing .40S&W caliber ammunition. The associations made in this examination are based on the observation of agreement of all discernable class characteristics and sufficient agreement of individual tool mark characteristics.
TRWTQZ	Items 001-1-A through 001-1-C are three PMC brand 40 S&W caliber fired cartridge cases. I microscopically compared these cartridge cases to each other and concluded these test fires have a reproducible signature that is identifiable. Items 001-2 through 001-5 are four PMC brand 40 S&W caliber fired cartridge cases. I microscopically compared these cartridge cases to each other and to a test fired cartridge case from the CZ pistol. I observed agreement of all discernable class characteristics and sufficient agreement of individual characteristics to conclude that Item 001-5 was fired from the CZ pistol. I observed disagreement of discernable class characteristics when comparing Items 001-2 through 001-4 to a test fired cartridge case from the CZ pistol. Therefore, Items 001-2 through 001-4 were not fired in the CZ pistol. I observed agreement of all discernable class characteristics and sufficient agreement of individual characteristics to conclude that Items 001-2 through 001-4 were fired from a single firearm.
TTFMYF	Items 1.2, 1.3, and 1.4 were microscopically compared to each other. The comparison revealed that the cartridge cases had the same class characteristics and sufficient agreement of individual characteristics. Items 1.2, 1.3, and 1.4 were identified as having been discharged by the same unknown 40 S&W caliber firearm (IDENTIFICATION). Items 1.2, 1.3, and 1.4 were also microscopically compared to the Item 1.1 cartridge cases. The comparison revealed that Items 1.2, 1.3 and 1.4 had different class characteristics when compared to the Item 1.1 cartridge cases. Items 1.2, 1.3, and 1.4 were eliminated as having been discharged by the same firearm that discharged the Item 1.1 cartridge cases (ELIMINATION). Item 1.5 was microscopically compared to the Item 1.1 cartridge cases. The comparison revealed that the cartridge cases had the same class characteristics and sufficient agreement of individual characteristics. Items 1.5 and 1.1 were identified as having been discharged by the same 40 S&W caliber firearm (IDENTIFICATION).
TW7GH4	The three expended cartridge cases contained in laboratory evidence item 1 (laboratory designated as 1.1A-C) were reportedly fired from a CZ 40B 40 S&W caliber pistol. The expended cartridge cases contained in laboratory evidence items 1.1 and 1.5 were microscopically compared to each other with the following results. Laboratory evidence items 1.1 and 1.5 were all identified as having been fired from the same firearm. The expended cartridge cases contained in laboratory evidence item 1.1 were microscopically compared to

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	the cartridge cases contained in laboratory evidence items 1.2, 1.3, and 1.4 with the following results. Laboratory evidence items 1.2, 1.3, and 1.4 were excluded as having been fired from the same firearm as item 1.1. The expended cartridge cases contained in laboratory evidence items 1.2, 1.3, and 1.4 were microscopically compared to each other with the following results. Laboratory evidence items 1.2, 1.3, and 1.4 were all identified as having been fired from the same firearm.
TZ2ML8	The microscopic comparison of the three cartridge cases with the No. Item 1, which originate from the above-mentioned suspected weapon, showed matching class characteristics as well as matching striations with the cartridge case Item 5. This means that the seized firearm was used to fire the shot resulted in cartridge case Item 5.
U266X3	1) The Item (5) fired bullet case was fired by the same firearm that fired the known Item (1) test fired bullet cases. This identification is based on sufficient agreement of the combination of individual characteristics and all discernible class characteristics. 2) The Items 2, 3 and 4 fired bullet cases were not fired by the same firearm that fired the known Item 1 test fired cartridge cases. These eliminations are based on differences in class characteristics. The Items 2,3 and 4 fired bullets cases were fired in the same unknown firearm. This identification is based on sufficient agreement of the combination of individual characteristics and all discernible class characteristics.
U6H3Z7	1. Examinations showed Item 5 was discharged within the same firearm as Item 1. 2. Examinations showed Items 2, 3, and 4 were not discharged within the same firearm as Item 1.
U7HDET	Through macroscopic/microscopic examination and based on agreement of discernible class characteristics and sufficient corresponding individual detail, the fired 40 S&W caliber cartridge cases, Laboratory Items 1 and 5, were identified as having been fired in the same firearm. Through macroscopic/microscopic examination and based on agreement of discernible class characteristics and sufficient corresponding individual detail, the fired 40 S&W caliber cartridge cases, Laboratory Items 2, 3, and 4, were identified as having been fired in the same firearm. Through macroscopic/microscopic examination and based on significant disagreement of class characteristics, the fired 40 S&W caliber cartridge cases, Laboratory Items 1 and 5, could not have been fired in the same firearm as the fired 40 S&W caliber cartridge cases, Laboratory Items 2, 3, and 4.
U8TFZQ	Through macroscopic/microscopic examination and based on agreement of discernible class characteristics and sufficient corresponding individual detail, the fired 40 S&W caliber cartridge cases, Laboratory Items 1 and 5, were identified as having been fired in the same firearm. Through macroscopic/microscopic examination and based on agreement of discernible class characteristics and sufficient corresponding individual detail, the fired 40 S&W caliber cartridge cases, Laboratory Items 2, 3, and 4, were identified as having been fired in the same firearm. Through macroscopic/microscopic examination and based on significant disagreement of class characteristics, the fired 40 S&W caliber cartridge cases, Laboratory Items 1 and 5, could not have been fired in the same firearm as the fired 40 S&W caliber cartridge cases, Laboratory Items 2, 3, and 4.
UA9GK7	Item 5 was fired in the same firearm as the item 1 test fires. Items 2, 3, and 4 were fired in a second firearm.
UAXDHU	1. Los indicios 2, 3 y 4, consisten en tres casquillos calibre .40 S&W, fueron percutidos por la misma arma de fuego y cuentan con suficientes características para realizar estudios de comparación microscópica. Los posibles fabricantes de armas de fuego que los pudieron haber percutido son: SMITH 6 WESSON, CESKA ZBROJOVKA, TAURUS Y STAR. Items 2, 3

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	and 4, consist of three expended cartridge cases Cal. .40 S&W, were percussed by the same firearm and have sufficient characteristics to carry out microscopic comparison studies. The possible manufacturers of firearms that could have struck them are: SMITH & WESSON, CESKA ZBROJOVKA, TAURUS AND STAR. 2. El indicio 5 fue percutido por el arma de fuego CZ 40B, Cal. 0.40 S&W (posesión del sospechoso) y corresponde al calibre .40 S&W; cuentan con suficientes características para confronta. Item 5 was percussed by a CZ 40B, Cal. 0.40 S&W firearm (possessed by the suspect) and corresponds to the .40 S&W caliber; it has enough characteristics to confront.
UFUAUK	Items 1 and 5: The cartridge cases Items 1(A, B, C) were visually inspected. The cartridge case Item 5 was Identified to the cartridge case Item 1A. Items 2, 3, and 4: The cartridge cases were Identified to each other. They were Eliminated from the cartridge cases Items 1 and 5.
UFVPZB	Cartridge Case Analysis: Methodology: Physical (Visual Examination). Microscopy (Comparison Microscope). Items 1A, 1B, 1C, and 5, the cartridge cases, were fired in the same firearm based corresponding class and individual microscopic characteristics. Items 2, 3, and 4, the cartridge cases, were fired in the same firearm based corresponding class and individual microscopic characteristics. Items 2, 3, and 4, the cartridge cases, were not fired in the same firearm as Items 1A, 1B, 1C, and 5, the cartridge cases, based upon different class and individual microscopic characteristics.
UKYZAQ	The three (3) fired cartridge cases, items 2, 3, and 4, were each identified as having been fired in the same unknown firearm. The three (3) fired cartridge cases, items 2, 3, and 4, were each eliminated as having been fired from item 1. The one (1) fired cartridge case, item 5, was identified as having been fired in item 1.
UNNHEC	The cartridge case Item 5 was Identified as having been fired in the same firearm as the known cartridge cases Item 1. These cartridge cases were Eliminated from the cartridge cases Items 2, 3, and 4. The cartridge cases Items 2, 3 and 4 were Identified as having been fired in a single (second) firearm.
UQFYN6	Exhibit 5 (fired .40 S&W casing) was identified as having been fired in the same firearm as exhibit 1 (test fired casings). Exhibits 2 through 4 (fired .40 S&W casings) were identified as having been fired in a second .40 S&W firearm. Suspect weapons are unknown at this time; however, any suspect weapon should be submitted for examination.
UT437X	Comparisons: The evidence cartridge cases were examined and microscopically compared to each other and to the cartridge cases reportedly fired in the CZ pistol with the following results: One cartridge case (Lab Item 5) was identified as having been fired in the CZ pistol. Three cartridge cases (Lab Items 2, 3, and 4) were identified as having been fired in a single firearm. They were eliminated as having been fired in the CZ pistol.
UXE9MP	1. Exhibit 1 contains three 40 S&W cartridge cases that are test standards from a CZ 40B pistol. 2. Exhibits 2, 3, 4 and 5 each contain one 40 S&W cartridge case, which were microscopically compared to the Exhibit 1 test standards. a. Microscopic comparison disclosed sufficient agreement of class and individual characteristics to conclude that Exhibit 1 and Exhibit 5 were fired in the same firearm. b. Microscopic comparison disclosed sufficient agreement of class and individual characteristics to conclude that Exhibits 2, 3 and 4 were fired in the same firearm. c. Microscopic comparison disclosed sufficient disagreement of class and individual characteristics to conclude that Exhibits 2, 3 and 4 were not fired in the same firearm as the Exhibit 1 test standards.
V3QGQF	Items 1, 2, 3, 4, 5: A microscopic comparison was conducted between Test cartridge case # 1, Item 1 that was fired in Evidence Submission 1 and Item 5. The examinations determined

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	that Item 5 was fired in the firearm, Evidence Submission 001 due to a sufficient agreement between the firing pin and breech face markings. A microscopic comparison was conducted between Items 2, 3 and 4. The examinations determined that Items 2, 3 and 4 were all fired in the same firearm due to a sufficient agreement between the firing pin and breech face markings. A microscopic comparison was conducted between Test Cartridge Case # 1, Item 1 that was fired in Evidence Submission 1 and Items 2, 3 and 4. The examinations determined Items 2, 3 and 4 were not fired in the firearm, Evidence Submission 1 due to a disagreement of individual characteristics. Disposition: The above listed evidence will be forwarded to the Property Custody Division. All firearm comparison examinations were conducted using the AFTE's (Association of Firearm & Tool Mark Examiners) Theory of Identification. Identifications are the opinion of a qualified examiner that two tool marks were made by the same tool based on sufficient agreement of individual characteristics. The agreement of individual characteristics is of a quantity and quality that the likelihood another (different) tool could have made the mark is so remote as to be considered a practical impossibility. All exclusions and inconclusive findings were based upon exemplars available at the time of the examinations.
V46TRJ	One expended cartridge case (Item 5) is identified as being fired in the CZ pistol (Item 1). The other three expended cartridge cases (Items 2, 3, and 4) are identified as being fired in a second firearm.
V68TG4	Item 5 was fired in the same firearm as the item 1 test fires. Item 2, 3 and 4 were fired in a second firearm.
V8KCMA	I was asked to determine if any of the four recovered fired cartridge cases (item 2 through to item 5) had been fired in the same firearm as the three test-fired cartridge cases (item 1). I compared these cartridge cases to each other using a comparison microscope, which allows me to examine the microscopic surface detail of two objects side by side. If two cartridge cases have been fired in the same firearm, the marks that are made during the firing process should correspond. If two cartridge cases have been fired in different firearms, then these marks should be different. I compared the fired cartridge cases to each other to determine if there were correspondences or differences between the firing marks. I observed an excellent correspondence of firing pin size, shape and microscopic detail between the firing pin impressions of the recovered fired cartridge case item 5 and the test-fired cartridge cases, item 1. I also observed an excellent correspondence of breech face marks between these cartridge cases. In my opinion, this correspondence means that this fired cartridge case could have been fired in the same firearm as the test-fired cartridge cases, however it could also have been fired in a different firearm, which contained a firing pin with the same size and shape and microscopic surface detail and a breech face with the same microscopic surface detail. In subjectively assessing the significance of these comparison findings, I have considered the probability of these findings given the following two propositions: Either: The recovered cartridge case (item 5) had been fired in the same firearm as the test-fired cartridge cases (item 1). Or: The recovered cartridge case (item 5) had been fired in a different firearm to the test-fired cartridge cases (item 1). Given the large variation in firing pin shapes, as well as the exceptionally large variation in the microscopic detail present on the surfaces of firing pins and breech faces, I would expect to see differences in these marks if they had been fired in different firearms. Therefore, in my opinion, these comparison findings provided extremely support for the proposition that the recovered cartridge case (item 5) had been fired in the same firearm as the test-fired cartridge cases (item 1). The recovered fired cartridge cases, item 2 through to item 4, had firing pin impressions that were different to the firing pin impressions on the test-fired cartridge cases, item 1. Therefore, in my opinion, these three fired cartridge cases had not been fired in the same firearm as the test-fired cartridge cases.

TABLE 2

WebCode	Conclusions
VAV8GQ	Item 5 was identified as having been fired in the same firearm as Item 1. Item 1 was reportedly test fired in a CZ model 40B, .40 S&W caliber semi-automatic pistol. Items 2, 3 and 4 were eliminated as having been fired in the same firearm as Item 1. Items 2, 3 and 4 were identified as having been fired in the same unknown firearm.
VETZZ2	Items 1A – 1C, 5: The Item 5 cartridge case was Identified to the Item 1A cartridge case. The Item 1B and 1C cartridge cases were not further examined. Items 2, 3, 4: The cartridge cases were Identified to each other. The cartridge cases were Eliminated to the Item 1A – 1C, and 5 cartridge cases.
VH2XXG	Results: IDENTIFICATION: The following items were compared and were found to show the presence of matching features. The opinion of Identification is based upon the agreement of a combination of individual characteristics and all discernible class characteristics consistent with having been fired by the same firearm. Item 1 (test fires). Item 5. IDENTIFICATION: The following items were compared and were found to show the presence of matching features. The opinion of Identification is based upon the agreement of a combination of individual characteristics and all discernible class characteristics consistent with having been fired by the same firearm. Items 2 – 4: ELIMINATION: Items 2 – 4 can be eliminated as having been fired by the firearm for Item 1 (test fired discharged cartridge cases) based on differences in class and individual characteristics.
VH8UHJ	After microscopic comparison, it was determined that Item# 5 was fired from Item# 1 based on sufficient agreement of class and individual characteristics of firing pin impression and breech face marks. After microscopic comparison, it was determined that Items# 2, 3, and 4 were fired in the same unrecovered firearm based on sufficient agreement of class and individual characteristics of the breech face marks.
VJRXJC	The Item 5 cartridge case was identified, within the limits of practical certainty1, as having been fired by the same handgun that generated the Item 1 cartridge cases. The Item 2, 3 and 4 cartridge cases were identified, within the limits of practical certainty1, as having been fired in the same firearm. The Item 2, 3 and 4 cartridge cases were eliminated as having been fired in the handgun that generated the Item 1 cartridge cases.
VLHE3F	Tests fired in Item #1 have been compared microscopically with Items #2, 3, 4 and 5. Based on agreement of all discernible class characteristics and a sufficient agreement of corresponding individual characteristics Item #5 has been identified as being fired in Item #1. Items #2, 3 and 4 have been compared microscopically with each other and based on the agreement of all discernible class characteristics and a sufficient agreement of individual characteristics they have been identified as being fired in the same firearm and have been eliminated as to being fired in Item #1 due to sufficient disagreement in individual characteristics.
VRKG92	The fired cartridge case in Submission #1e (Item 5) was microscopically compared and identified as having been fired from the firearm indicated as having fired the test fired cartridge cases in Submission #1a (Item 1) based on sufficient agreement in individual characteristics present to conclude an identification. The fired cartridge cases in Submissions #1b-1d (Items 2-4) were microscopically compared and identified as having been fired from the same unknown firearm based on sufficient agreement in individual characteristics present to conclude an identification. They were eliminated as having been fired from the firearm indicated as having fired the test fired cartridge cases in Submission #1a (Item 1) based on different class characteristics and sufficient differences in individual characteristics present.
VTE9ZD	Item 1 known fired cartridge cases and Item 5 questioned fired cartridge case were fired in the

TABLE 2

WebCode	Conclusions
	same firearm. Item 1 known fired cartridge cases and Items 2, 3, and 4 questioned fired cartridge cases were not fired in the same firearm. Items 2, 3 and 4 questioned fired cartridge cases were fired in the same firearm.
VUVT2G	The 0001-AB (Item 2), 0001-AC (Item 3), and 0001-AD (Item 4) cartridge cases were microscopically compared to the 0001-AA (Item 1) cartridge cases with NEGATIVE RESULTS. The 0001-AB (Item 2), 0001-AC (Item 3), and 0001-AD (Item 4) cartridge cases were eliminated as having been fired in the same firearm that fired the 0001-AA (Item 1) cartridge cases. The 0001-AB (Item 2), 0001-AC (Item 3), and 0001-AD (Item 4) cartridge cases were microscopically compared to each other with POSITIVE RESULTS. The 0001-AB (Item 2), 0001-AC (Item 3), and 0001-AD (Item 4) cartridge cases were fired in the same firearm. The 0001-AE (Item 5) cartridge case was microscopically compared to the 0001-AA (Item 1) cartridge cases with POSITIVE RESULTS. The 0001-AE (Item 5) cartridge case was fired in the same firearm that fired the 0001-AA (Item 1) cartridge cases.
VY3U7E	Item 5 was fired in the same firearm as the item 1 test fires. Items 2, 3, and 4 were fired in a second firearm.
VYPBBA	Item 1 - three (3) submitted caliber .40S&W test fired cartridge cases Item 2 - one (1) fired caliber .40S&W cartridge case bearing the PMC brand headstamp Item 3 - one (1) fired caliber .40S&W cartridge case bearing the PMC brand headstamp Item 4 - one (1) fired caliber .40S&W cartridge case bearing the PMC brand headstamp Item 5 - one (1) fired caliber .40S&W cartridge case bearing the PMC brand headstamp The submitted specimen marked as Item 5 was microscopically examined against the Item 1 test fired cartridge cases. As a result of microscopic examination it was concluded that Item 5 was identified as having been fired in the same firearm as the Item 1 test fired cartridge cases. The submitted specimens marked as Items 2 through 4 were microscopically cross compared. As a result of examination it was concluded that these Items were identified as having been fired from the same firearm.
W24E96	Item 5 was fired in the same firearm as the item 1 test fires. Items 2, 3 and 4 were fired in a second firearm.
W8EH8K	The Item 1 and Item 5 cartridge cases were fired by the same firearm. The Item 2, Item 3, and Item 4 cartridge cases were fired by the same firearm. The Item 1 and Item 5 cartridge cases were fired by a different firearm than the Item 2 through 4 cartridge cases.
WAF4NJ	Q2 - Q5 were examined and determined to be four (4) fired, PMC 40 S&W, brass/brass casings. Q2 - Q5 were microscopically compared to the three (3) fired casings label as being fired by K1. It is my opinion that Q5 was fired by K1 based on sufficient agreement of breechface marks seen on the primers. See photos for areas of comparison. Q2 - Q4 were eliminated as having been fired by K1 based on lack of agreement of all discernable marks seen on the primers.
WEAYQR	In my opinion, a microscopical comparison of firing marks has shown that there is sufficient agreement of class and individual characteristic markings to conclusively determine that T5 was discharged in the recovered firearm T1 (Gun 1).
WEYLC2	1 vs 5 Microscopic comparisons were conducted between the cartridge case (Item 5) and the test fired cartridge case (Item 1). The cartridge case (Item 5) was identified as having been fired in the firearm that produced the test fired cartridge cases (Item 1). The identification was based on the agreement of all discernible class characteristics and sufficient agreement of individual markings present on the cartridge cases. 1 - 4 Microscopic comparisons were conducted between the cartridge cases (Items 2, 3, and 4) and the test fired cartridge case (Item 1). The cartridge cases (Items 2, 3, and 4) were not fired in the same firearm as the test fired cartridge

TABLE 2

WebCode	Conclusions
	case (Item 1). There exists a disagreement of the discernible class characteristics and individual markings to eliminate the cartridge cases (Items 2, 3, and 4) as having been fired in the firearm that produced the test fired cartridge cases (Item 1). 2 - 4 Microscopic comparisons were conducted between the cartridge cases (Items 2, 3, and 4). The cartridge cases were identified as having been fired in the same unknown firearm. The identification was based on the agreement of all discernible class characteristics and sufficient agreement of individual markings present on the cartridge cases.
WF22BL	Item 2-3-4 are discharged from a different firearm - this firearm is the same one for each 3 items (item 2-3-4).
WKTVYR	Items 2, 3 and 4 were Identified to each other. Items 2, 3 and 4 were Eliminated to the Item 1 firearm. Item 5 was Identified to the Item 1 firearm.
WKWF49	Item 5 was fired in the same firearm as Item 1 (identification). This is also the opinion of Firearms Examiner NAME. Items 2 through 4 were not fired in the same firearm as Item 1 (elimination). This is also the opinion of Firearms Examiner NAME. Items 2 through 4 were fired in the same firearm (identification). This is also the opinion of Firearms Examiner NAME.
WWQ6XG	Item 5 was identified as having been fired by the same firearm that produced the test fired cartridge cases, item 1, based on sufficient agreement of class and individual characteristics. Items 2,3 and 4 were eliminated as having been fired by the same firearm that produced the test fired cartridge cases, item 1, based on disagreement of individual characteristics. However, items 2, 3 and 4 were all identified as having been fired by the same unknown firearm, based on sufficient agreement of class and individual characteristics.
WXQPT3	Item 2, 3 and 4 were all fired by the same unknown weapon capable of chambering .40 S&W caliber ammunition, not the weapon that fired the tests in item 1. item 5 was fired by the weapon that fired the tests in item 1
X7WTGC	The three submitted fired cartridge cases, Agency Exhibit 1, were all fired in the same firearm, reportedly from a CZ 40B pistol. The submitted fired cartridge case, Agency Exhibit 5, was eliminated as having been fired in the same firearm as the three submitted fired cartridge cases, Agency Exhibits 2 to 4, due to differences in both class and individual characteristics. It was identified as having been fired in the same firearm as the three submitted fired cartridge cases, Agency Exhibit 1, reportedly fired in a CZ 40B pistol. The three submitted fired cartridge cases, Agency Exhibits 2 to 4, were all identified as having been fired in the same unknown firearm. They were eliminated as having been fired in the same firearm as the three submitted test fired cartridge cases, Agency Exhibit 1, reportedly fired in a CZ 40B pistol, due to differences in individual characteristics.
X8DRUA	Microscopic examination and comparison of the PMC cartridge cases (Items 1, 1A, 1B and 5) revealed sufficient agreement of individual characteristics to conclude that they were identified as having been fired in the same firearm. Microscopic examination and comparison of the PMC cartridge cases (Items 2, 3 and 4) revealed sufficient agreement of individual characteristics to conclude that they were identified as having been fired in the same firearm. Microscopic examination and comparison of the PMC cartridge cases (Items 1, 1A, 1B and 5) revealed they can be eliminated as having been fired in the same firearm that fired the PMC cartridge cases (Items 2, 3 and 4) based on differences in class characteristics.
X8J6MQ	Item 5 was identified as having been fired from the submitted firearm. Items 2, 3, and 4 were identified as having been fired from the same unknown firearm.
X9LZ2A	Item 5 was identified microscopically as having been fired in the same firearm as the test fires

TABLE 2

WebCode	Conclusions
	reportedly from Item 1 based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 2 - 4 were microscopically eliminated as having been fired in the same firearm as the test fires reportedly from Item 1 due to disagreement of discernible individual characteristics. Items 2 - 4 were identified microscopically as having been fired in the same unknown firearm based on agreement of the combination of individual characteristics and all discernible class characteristics.
XCXHRK	One of the recovered questioned cartridge cases (Item 5) is identified to be fired from the same firearm as the known cartridges cases(Item 1) .
XD8U4U	Results of Examinations: Item 1 through Item 5 consist of eight (8) .40 S&W caliber catridge cases, which bear the name of PMC ammunition. The Item 5 cartridge case was identified as having been fired in the firearm that fired the Item 1 cartridge cases. The Item 2 through Item 4 cartridge cases were identified as having been fired in the same firearm, and were excluded as having been fired in the firearm that fired the Item 1 and Item 5 cartridge cases, due to a difference in class characteristics.
XDFWNE	The three submitted fired 40 S&W caliber cartridge cases (items 1A-1C) were identified as having been fired in the same firearm. The three submitted fired 40 S&W caliber cartridge cases (items 2-4) were eliminated from having been fired in the same firearm as items 1A-1C. The three submitted fired 40 S&W caliber cartridge cases (items 2-4) were identified as having been fired in the same unknown firearm. The one submitted fired 40 S&W caliber cartridge case (item 5) was identified as having been fired in the same firearm as items 1A-1C.
XQDDUE	The cartridges cases No. 5 was discharged from the suspects firearm
XVA87H	Item 5 was discharged in the same firearm that discharged Item 1. Items 2, 3 and 4 were all discharged in another firearm.
XVP2TP	Through microscopic examination and comparison, it was determined that [Lab] Items 001-01 and 001-05 were fired by the same known firearm. Through microscopic examination and comparison, it was determined that [Lab] Items 001-02, 001-03, and 001-04 were fired by the same unknown firearm.
XZM839	the cartridge-case in item 5 was fired by the same gun that fired the cartridge-cases in item 1. the cartridge-cases in item 2, 3 and 4 were not fired by the same gun that fired the cartridge-cases in item 1.
Y2CBD8	RESULTS: Items 1 and 5: Item 1 was Identified to Item 5. Items 2, 3, 4: Items 2, 3 and 4 were Identified to each other. Items 2, 3 and 4 were Eliminated to Item 1. REMARKS: The method of testing for ammunition components (that have results that fall into the range of conclusions defined below) included physical examination and microscopic comparison. Elimination results that are reported as based on a difference in class characteristics include only physical examination. Identified: Agreement of all discernible class characteristics and sufficient agreement of individual characteristics where the extent of agreement leads to the conclusion that the items were fired in/from the same firearm. Inconclusive (+): Agreement of all discernible class characteristics and some agreement of individual characteristics but insufficient for an identification. Inconclusive: Agreement of all discernible class characteristics without significant agreement or disagreement of individual characteristics; therefore, the items could neither be identified nor eliminated as having been fired in/from the same firearm. Inconclusive (-): Agreement of all discernible class characteristics and some disagreement of individual characteristics, but insufficient for an elimination. Eliminated: Significant disagreement of discernible class characteristics and/or individual characteristics leading to the conclusion that the items were not fired in/from the same firearm.

TABLE 2

WebCode	Conclusions
Y3Q3JQ	Item 5 was identified as having been fired in the same firearm as the test fires of Item 1 based upon sufficient agreement of individual characteristics. Items 2, 3, and 4 were identified as having been fired in the same unknown firearm based upon sufficient agreement of individual characteristics (Unknown Firearm #1).
Y7XEYQ	I conducted a comparative microscopic examination between the three fired cartridge cases Item 1 and each of the fired cartridge cases in Items 2, 3, 4 and 5. I compared the class and individual features left on the fired cartridge cases as a result of being loaded into, discharged in, extracted and ejected from a firearm. In particular I examined and compared the three dimensional surface contours within the firing pin impressions and on the case heads from the breech face. This revealed the following – The fired cartridge case Item 5, was discharged in the same firearm as the fired cartridges cases, Item 1. The fired cartridge cases Items 2, 3 and 4, were all discharged in the same firearm. They were not discharged in the same firearm that discharged the fired cartridge cases Items 1 and 5.
YBX3WY	The test fired cartridge cases in Item 001-01 were microscopically examined and compared with the cartridge cases in Items 001-02 through 001-05 with the following results: Items 001-02, 001-03 and 001-04 were eliminated as having been fired in the same firearm as the test fired cartridge cases in Item 001-01. Item 001-05 was identified as having been fired in the same firearm as the test fired cartridge cases in Item 001-01.
YFHCG3	After physical and microscopic examination of the submitted evidence against the test fires from the submitted firearm, I found the following: A) IDENTIFICATION: Item 1-5: One (1) .40 S&W caliber Discharged Cartridge Casing WAS FIRED BY the .40S&W caliber, CZ, Model 40B semi-auto Pistol, that was used to Test Fire Items 1-1 (A-C). B) EXCLUSION: Items 1-2, 1-3, 1-4: Three (3) .40 S&W caliber Discharged Cartridge Casings WERE NOT FIRED BY the .40S&W caliber, CZ, Model 40B semi-auto Pistol, that was used to Test Fire Items 1-1 (A-C). C) IDENTIFICATION: Items 1-2, 1-3, 1-4: Three (3) .40 S&W caliber Discharged Cartridge Casings WERE FIRED BY the same unknown weapon capable of chambering and discharging .40S&W caliber live ammunition.
YGDAVH	Based on microscopic comparisons, it was determined that the four cartridge cases (associated with Items 1 and 5) were all fired by the same firearm, reportedly a 40 S&W caliber CZ, model 40B, semiautomatic pistol. Based on microscopic comparisons, it was determined that the remaining three cartridge cases (associated with Items 2, 3, and 4) were all fired by a second unknown firearm.
YHT4MY	EXAMINATION/CONCLUSION: Items #2, #3 and #4 were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items #2, #3 and #4 are identified as having been fired in the same firearm. Item #2 and Item #5 were microscopically examined and compared. Based on the observed disagreement of class and individual characteristics, Item #2 and Item #5 are eliminated as having been fired in the same firearm. Item #1 (Agency Test Fire) was microscopically examined and compared to Item #2. Based on the observed disagreement of class and individual characteristics, Item #1 (Agency Test Fire) is eliminated as having been fired in the same firearm as Item #2. Item #1 (Agency Test Fire) was microscopically examined and compared to Item #5. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Item #1 (Agency Test Fire) is identified as having been fired in the same firearm as Item #5. The evidence will be returned to the submitter.
YMEAZY	a. The discharged cartridge casing mentioned in Item 1-5 above was fired from the suspect

TABLE 2

WebCode	Conclusions
	weapon which is the source weapon of the Item 1-1 test firings. b. The discharged cartridge casings mentioned in Items 1-2, 1-3, 1-4 were fired from the same unknown weapon, to exclude the suspect weapon which is the source weapon of the Item 1-1 test firings.
YMZUNJ	A test fired cartridge case from Item 1 was microscopically examined and compared with a recovered fired cartridge case, Item 5. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Item 5 is identified as having been fired in the same firearm as the test fired cartridge cases from Item 1. The test fired cartridge cases from Item 1 were microscopically examined and compared with the recovered fired cartridge cases, Items 2, 3 and 4. There is observed agreement of some class characteristics. However, based on the observed disagreement of individual characteristics, Items 2, 3 and 4 were not identified as having been fired in the same firearm as the test fired cartridge cases from Item 1.
YNDPLP	Laboratory Items 001.B through 001.D (items 2 though 4) three spent brass PMC 40 S&W cartridge cases are identified as being fired by the same firearm. Laboratory Items 001.B through 001.D (items 2 though 4) three spent brass PMC 40 S&W cartridge cases are eliminated as being fired by the suspect's firearm that fired Laboratory Item 001.A (Item 1) three test fires. Laboratory Item 001.E (Item 5) spent brass PMC 40 S&W cartridge case is identified as being fired by the suspect's firearm that fired Laboratory Item 001.A (Item 1) three test fires.
YQR3TK	Microscopic examination and comparison of the fired evidence cartridge case (item # 5) with the three test fired cartridge cases (item # 1) reveals sufficient evidence to conclude that the fired evidence cartridge case (item # 5) was fired in the chamber of the pistol which fired the three test fired cartridge cases (item # 1). Microscopic examination and comparison of the three evidence fired cartridge cases (items # 2, 3 & 4) with the three test fired cartridge cases (item # 1) reveals sufficient evidence to conclude that the three fired evidence cartridge cases (items # 2, 3 & 4) were NOT fired in the chamber of the pistol which fired the three test fired cartridge cases (item # 1). Microscopic examination and inter-comparison of the three evidence fired cartridge cases (items # 2, 3 & 4) reveals sufficient evidence to conclude that the three fired evidence cartridge cases (items # 2, 3 & 4) were fired in the chamber of the same pistol. The pistol which fired these three evidence fired cartridge cases is NOT the same pistol as fired the three test fired cartridge cases (item # 1).
YXXQQK	The Item 5 fired cartridge case was fired in the known firearm that fired the submitted Item 1 test fired cartridge cases. This identification is based on sufficient agreement of the combination of individual characteristics and all discernible class characteristics. The Items 2, 3, and 4 fired cartridge cases were fired in the same unknown firearm. These identifications are based on sufficient agreement of the combination of individual characteristics and all discernible class characteristics. The Items 2, 3, and 4 fired cartridge cases were not fired in the known firearm that fired the submitted Item 1 test fired cartridge cases. These eliminations are based on differences in class characteristics.
YYP8UW	The CZ pistol, item 1 was test fired using material from the laboratory collection. The reference fired cartridge cases were compared to items 2, 3, 4 and 5. It was determined that item 5 was fired by item 1. Items 2, 3 and 4 were fired by the same firearm, but not by item 1.
YZGDXT	Compared test shells against the shell marked #5 with positive results. (Identification) The shell marked #5 was identified as having been discharged in the submitted CZ pistol. Compared test shells against the three shells marked #2 thru #4 with negative results. (Elimination) The three shells marked #2 thru #4 were eliminated as having been discharged in the submitted CZ pistol. Compared the three shells marked #2 thru #4 against each other with positive

TABLE 2

WebCode	Conclusions
	results. (Identification) The three shells marked #2 thru #4 were identified as having been discharged in the same firearm.
Z3NK3C	Lab Items #1 (three PMC {Precision Made Cartridges} .40 S&W test fired cartridge cases), #2, #3, #4, and #5 (four PMC {Precision Made Cartridges} .40 S&W fired cartridge cases) were examined and microscopically compared on 07/11/2023. Based on agreement of all discernable class characteristics and sufficient agreement of individual characteristics, Lab Item #5 (one PMC {Precision Made Cartridges} .40 S&W fired cartridge case) was positively identified as having been fired in the same firearm as Lab Item #1 (three test fired cartridge cases). Based on disagreement of class characteristics, Lab Items #2, #3, and #4 (three .40 S&W fired cartridge cases) were eliminated as having been fired in the same firearm as Lab Item #1 (three test fired cartridge cases). Based on agreement of all discernable class characteristics and sufficient agreement of individual characteristics, Lab Items #2, #3, and #4 (three .40 S&W fired cartridge cases) were positively identified as having been fired in the same firearm.
Z9Y96U	Items 1 and 5 were identified as having been fired by the same firearm based on agreement of class and individual characteristics. Items 2, 3 and 4 were identified as having been fired by the same firearm based on agreement of class and individual characteristics. Items 2, 3 and 4 were eliminated as having been fired by the same firearm that fired Items 1 and 5 based on differences in class characteristics.
ZCG4TY	During the comparison against the test exhibits (Item 1) and the fired cartridge case (Item 5), I observed: 1. Strong correspondence in the overall size, shape and relative position and orientation of the firing-pin impression, firing pin aperture and breechface, and 2. Strong correspondence of the visible characteristics and striae details within the firing-pin impressions, firing-pin apertures and breechface marks. As a result of these observations, I formed the opinion that the exhibit fired cartridge case (Item 5) had been discharged in the CZ 40B pistol. (Gun1)
ZG8FPG	After microscopic comparison, it was determined that Item 5 was fired in the CZ pistol. After further examination, it was determined that Items 2, 3 & 4 were not fired in the CZ pistol. It was also determined that Items 2, 3 & 4 were all fired in the same unknown weapon capable of chambering and firing .40S&W caliber ammunition.
ZHWLFZ	Cartridge case Q4 was identified as having been fired with the K1 firearm. Cartridge cases Q1-Q3 were identified as having been fired with the same unknown firearm. Cartridge cases Q1-Q3 were excluded as having been fired with K1 based on sufficient disagreement of class and individual characteristics.
ZQQQ92	Visual and microscopic analyses of the evidence cartridge cases (item 2 through item 5) and the test fired cartridge cases from the CZ 40B pistol (item 1) were performed on July 10, 2023 and the results of the comparisons and evaluations are as follows: Based on agreement of discernible class characteristics and sufficient agreement of individual characteristics, Q4 (item 5) is identified as having been fired with the CZ 40B pistol (item 1). Based on agreement of discernible class characteristics and sufficient agreement of individual characteristics, Q1 (item 2), Q2 (item 3) and Q3 (item 4) are identified as having been fired with the same unknown firearm (unknown firearm #1). Based on significant disagreement of individual characteristics, Q1 (item 2), Q2 (item 3) and Q3 (item 4) are excluded as having been fired with the CZ 40B pistol (item 1).
ZR92WF	The test-fired cartridge cases in item 1 were compared to the discharged cartridge case, item 5, using a comparison microscope. In my opinion, the cartridge case was fired in that firearm

TABLE 2

WebCode	Conclusions
	that generated those test-fired cartridge cases, due to agreement of discernible class characteristics and sufficient agreement of individual characteristics. The test-fired cartridge cases in item 1 were also compared to the discharged cartridge cases, items 2 through 4, using a comparison microscope. In my opinion, those cartridge cases were eliminated from being fired in that firearm, due to sufficient disagreement of discernible class and individual characteristics.
ZW3VUG	Item 5 was fired in the CZ firearm. Items 2 through 4 were fired in the same firearm but not the CZ firearm.
ZY6ZUW	The item 5 questioned cartridge case was identified as having been fired in the same firearm as a known cartridge cases (item 1). Because of differences in individual characteristics, the items 2, 3 and 4 questioned cartridge cases could not have been fired in the same firearm as the known cartridge cases (item 1)
ZZV782	[State Police Department] Forensic Firearms Lab received the following inventory under the above listed Incident/Records Division Number. Inventory [number] containing: Item 1: Three (3) PMC .40 S&W cartridge cases (known test fires from CZ model 40B pistol), labeled Ex. 1A1 to 1A3. Item 2: One (1) PMC .40 S&W cartridge case, labeled A1. Item 3: One (1) PMC .40 S&W cartridge case, labeled A2. Item 4: One (1) PMC .40 S&W cartridge case, labeled A3. Item 5: One (1) PMC .40 S&W cartridge case, labeled A4. RESULTS OF EXAMINATION: The above listed cartridge cases were examined microscopically and identified as having been fired in two (2) different firearms, as follows: Item 1 (Ex. 1A1 to 1A3) and Item 5 (Ex. 4) were identified as having been fired in the same firearm (the CZ model 40B pistol). Items 2 to 4 (Ex A1-A3) were identified as having been fired in the same firearm. These cartridge cases were eliminated as having been fired in the Item 1 due to sufficient differences in individual characteristics.
ZZVEL9	Sufficient agreements of class and individual characteristics confirmed the item 5 expended cartridge case was fired in the same firearm as the item 1 expended cartridge cases. Disagreements of class characteristics confirmed the item 2, 3, and 4 expended cartridges cases were not fired in the same firearm as the item 1 expended cartridge cases.

Additional Comments

TABLE 3

WebCode	Additional Comments
28JGLC	Conclusion Scale for Microscopic Comparisons: The following descriptions are meant to provide context to the levels of opinions reached in this report. Identification: This is the strongest statement of association that can be expressed. An identification is made to a degree of practical certainty when there is agreement of all discernible class characteristics and sufficient agreement of the individual characteristics of toolmarks. When sufficient agreement exists, in part, this means the likelihood of another tool producing the same marks is so remote it is considered a practical impossibility. Elimination: This is the strongest statement of non-association that can be expressed. An elimination is made when it is physically impossible (i.e., there is a clear, demonstrable incompatibility in class characteristics) for the items to have been marked by the same tool/fired in the same firearm. Inconclusive: An inconclusive is made when one of the following situations is true. Agreement of all discernible class characteristics and some agreement of individual characteristics, but insufficient for identification. Agreement of all discernible class characteristics without agreement or disagreement of individual characteristics due to an absence, insufficiency, or lack of reproducibility. Agreement of all discernible class characteristics and disagreement of individual characteristics. Agreement of all discernible class and subclass characteristics. The individuality of the characteristics is not discernible; therefore, the items may have been fired from the same firearm or from another firearm that was machined with the same tool in the approximate same state of wear. Unsuitable: An item is considered unsuitable for comparison when it does not bear any class, subclass, and/or individual toolmarks of value for microscopic comparison. The interpretation of the data and authorization of the results was performed by the undersigned forensic analyst. Other staff members may have performed laboratory activities concerning evidence associated with this report. For a complete listing of all staff members who performed laboratory activities in this case, please contact the laboratory via the telephone number above. [Number not provided]
399UEY	Elimination of Items 2 to 4 from Items 1 and 5 occurred due to class.
4XH42Z	The vanillas described in ID EMP 2, 3 and 4 close to items 2,3 and 4, were percussed with the same firearm, different from the one found on the suspect.
4Y2P9J	Items #2, #3 and #4 were microscopically compared to each other, and an identification was made. Items #2, #3 and #4 were fired in the same firearm.
6AWCJC	Cartridge cases were received marked with a Sharpie type of marker. Sharpie markers easily wipe off. Please return to scribing the items.
6CLJ4A	The submitted test fired cartridge cases were renamed to be Items 1A, 1B, and 1C.
6LZFCE	ITEMS 2, 3 AND 4 WERE SHOCKED BY ANOTHER FIREARM, WHICH WAS NOT THE FIREARM DESCRIBED AS ITEM 1.
6NVGN4	Items 01-02, 01-03, and 01-04 were microscopically compared to Items 01-01 and 01-05. Differences in the firing pin impression (concentric rings vs smooth) and shape of the primer flow back were noted. Due to these differences, Items 01-02, 01-03, and 01-04 were eliminated as having been fired in the same firearm as Items 01-01 and 01-05.
73PVCG	Items 2, 3, 4 have potential subclass present. Areas on breechface in between potential subclass and also firing pin, firing pin aperture and firing pin drag all have areas for identification.
78FBNJ	As for item 2, 3, 4 (questioned) they didn't matched with item 1 (known). but item 2, 3, 4

TABLE 3

WebCode	Additional Comments
	matched with each other as they had similar breech face markings.
78LWL6	These items share agreement of class characteristics, but disagreement of the individual characteristics observed in the breech face marks on the primer.
79XWXK	The method of testing for ammunition components (that have results that fall into the range of conclusions defined below) included physical examination and microscopic comparison. Elimination results that are reported as based on a difference in class characteristics include only physical examination. Identified: Agreement of all discernible class characteristics and sufficient agreement of individual characteristics where the extent of agreement leads to the conclusion that the items were fired in/from the same firearm. Inconclusive (+): Agreement of all discernible class characteristics and some agreement of individual characteristics but insufficient for an identification. Inconclusive: Agreement of all discernible class characteristics without significant agreement or disagreement of individual characteristics; therefore, the items could neither be identified nor eliminated as having been fired in/from the same firearm. Inconclusive (-): Agreement of all discernable class characteristics and some disagreement of individual characteristics, but insufficient for an elimination. Eliminated: Significant disagreement of discernable class characteristics and/or individual characteristics leading to the conclusion that the items were not fired in/from the same firearm.
7ELMF9	NIBIN: A test fired cartridge case from Item 1, will be entered in NIBIN. The results of NIBIN entries and searches will be the subject of a separate report.
7G7TFW	The firearm that discharged the questioned FCC's (Items 2 - 4) is still outstanding!
7PVWDT	The method of testing for ammunition components (that have results that fall into the range of conclusions defined below) included physical examination and microscopic comparison. Elimination results that are reported as based on a difference in class characteristics include only physical examination. Identified: Agreement of all discernible class characteristics and sufficient agreement of individual characteristics where the extent of agreement leads to the conclusion that the items were fired in/from the same firearm. Eliminated: Significant disagreement of discernible class characteristics and/or individual characteristics leading to the conclusion that the items were not fired in/from the same firearm.
7R2H6Y	The questionable .40 swe cliber shells received for study and described in this report at EMP 2,3 y 4 (items 2,3 y 4) are not uniproven with the standard shells described in this report in the ID EMP 1 (Item 1) that is to sat that they were not struck by the same fire
7TT7CF	Identification: Based on the agreement of the individual characteristics observed through the microscopic comparison examination. [Examiner initials/date]
8CTKY7	Lab procedure does not permit eliminations based on individual characteristics. Because of this, the results are inconclusive.
8KW3UG	REMARKS: The method of testing for ammunition components (that have results that fall into the range of conclusions defined below) included physical examination and microscopic comparison. Elimination results that are reported as based on a difference in class characteristics include only physical examination. Identified: Agreement of all discernible class characteristics and sufficient agreement of individual characteristics where the extent of agreement leads to the conclusion that the items were fired in/from the same firearm. Inconclusive (+): Agreement of all discernible class characteristics and some agreement of individual characteristics, but insufficient for an identification. Inconclusive: Agreement of all discernible class characteristics without significant agreement or disagreement of individual characteristics; therefore, the items could neither be identified nor eliminated as having been

TABLE 3

WebCode	Additional Comments
	fired in/from the same firearm. Inconclusive (-): Agreement of all discernible class characteristics and some disagreement of individual characteristics, but insufficient for an elimination. Eliminated: Significant disagreement of discernible class characteristics and/or individual characteristics leading to the conclusion that the items were not fired in/from the same firearm. The submitted item(s) will be transferred to the Evidence Section for return to your agency. Questions regarding this report should be addressed to [Email].
8RVMWD	Marks in firing pin impression are different between Items 1 and 5 -granular vs Items 2, 3, and 4 -circular. More parallel evenly spaced finer breech face marks observed (per field of view) in Item #1TF's and Item #5 vs Items #2, #3, #4. Some possible subclass noted in breech face marks in Items 2, 3, and 4- not used for ID. Ejector mark morphology differences noted between Items 2, 3, 4 and Items 1 and 5.
97EWCA	Identification: Based on agreement of individual characteristics observed by comparison microscopic examination.
9BLPZE	I have assumed that the possibility of subclass influence was eliminated by the makers of this proficiency.
9UJQE6	One of the 40 S&W cartridge cases (Item 5) was microscopically compared to test-fired cartridge cases (Item 1) from the suspect's firearm. Item 5 was identified as being fired in the same firearm as Item 1 based on sufficient corresponding individual detail observed in breechface marks. Three of the 40 S&W cartridge cases (items 2 through 4) were microscopically compared to each other and to Item 1. Items 2 through 4 were eliminated as being fired in the same firearm as Item 1, based on class characteristic differences observed in ejector marks, and individual detail observed in breechface marks and firing pin impressions. Items 2 through 4 were identified as being fired in the same firearm based on agreement of class characteristics and sufficient corresponding individual detail observed in breechface marks.
A9WJFG	Methods: Pattern Examination: Toolmarks, whether they are present on evidence items or secondary evidence created in the Laboratory, undergo two stages of comparison. First, the class characteristics are examined and compared. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. Comparative examinations of the impressed and striated toolmarks, in at least two items, are conducted to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) Source Exclusion: Source exclusion is an Examiner's conclusion that two toolmarks did not originate from the same source. This conclusion is an Examiner's opinion that the observed difference(s) in class characteristics provides extremely strong support for the proposition that the two toolmarks came from different sources and extremely weak or no support for the proposition that the two toolmarks came from the same source. A source exclusion based on a minor difference in measured class characteristics requires a verification. 2) Source Identification: Source identification is an Examiner's conclusion that two toolmarks originated from the same source. This conclusion is an Examiner's opinion that all observed class characteristics are in agreement and the quality and quantity of corresponding individual characteristics is such that the Examiner would not expect to find that same combination of individual characteristics repeated in another source. The basis for a source identification conclusion is an Examiner's opinion that the observed class characteristics and corresponding individual characteristics provide extremely strong support for the proposition that the two toolmarks originated from the same source and extremely weak support for the proposition that the two toolmarks originated from different sources. A source identification requires a verification and is the

TABLE 3

WebCode	Additional Comments
	Examiner's opinion that the probability that the two toolmarks were made by different sources is so small that it is negligible. 3) Inconclusive: Inconclusive is an Examiner's conclusion that all observed class characteristics are in agreement but there is insufficient quality and/or quantity of corresponding individual characteristics such that the Examiner is unable to identify or exclude the two toolmarks as having originated from the same source. This conclusion is an Examiner's opinion that there is an insufficient quality and/or quantity of individual characteristics to identify or exclude. Reasons for an inconclusive conclusion include the presence of microscopic similarity that is insufficient to form the conclusion of source identification, or a lack of any observed microscopic similarity. Limitations: Pattern Examination: Firearms/Toolmark Identification is an empirical science that relies on objective measurements and a subjective comparison of microscopic marks of value. Due to variations in substrate, changes in tool working surfaces from wear, corrosion, subclass, damage, or the employment of unusual tool/work piece orientations, toolmark reproduction may be incomplete or insufficient, as a result it may not be possible for an examiner to reach a source conclusion. Additionally, some tool manufacturing methods routinely produce working surfaces that leave limited microscopic marks of value. Damaged, corroded, or fragmented items may be of little or no value for comparison purposes.
AA6VWJ	Methods: Pattern Examination: Toolmarks, whether they are present on evidence items or secondary evidence created in the Laboratory, undergo two stages of comparison. First, the class characteristics are examined and compared. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. Comparative examinations of the impressed and striated toolmarks, in at least two items, are conducted to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) Source Exclusion: Source exclusion is an Examiner's conclusion that two toolmarks did not originate from the same source. This conclusion is an Examiner's opinion that the observed difference(s) in class characteristics provides extremely strong support for the proposition that the two toolmarks came from different sources and extremely weak or no support for the proposition that the two toolmarks came from the same source. A source exclusion based on a minor difference in measured class characteristics requires a verification. 2) Source Identification: Source identification is an Examiner's conclusion that two toolmarks originated from the same source. This conclusion is an Examiner's opinion that all observed class characteristics are in agreement and the quality and quantity of corresponding individual characteristics is such that the Examiner would not expect to find that same combination of individual characteristics repeated in another source. The basis for a source identification conclusion is an Examiner's opinion that the observed class characteristics and corresponding individual characteristics provide extremely strong support for the proposition that the two toolmarks originated from the same source and extremely weak support for the proposition that the two toolmarks originated from different sources. A source identification requires a verification and is the Examiner's opinion that the probability that the two toolmarks were made by different sources is so small that it is negligible. 3) Inconclusive: Inconclusive is an Examiner's conclusion that all observed class characteristics are in agreement but there is insufficient quality and/or quantity of corresponding individual characteristics such that the Examiner is unable to identify or exclude the two toolmarks as having originated from the same source. This conclusion is an Examiner's opinion that there is an insufficient quality and/or quantity of individual characteristics to identify or exclude. Reasons for an inconclusive conclusion include the presence of microscopic similarity that is insufficient to form the conclusion of source identification, or a lack of any observed microscopic similarity. Limitations: Pattern Examination: Firearms/Toolmark Identification is an empirical science that relies on objective

TABLE 3

WebCode	Additional Comments
	measurements and a subjective comparison of microscopic marks of value. Due to variations in substrate, changes in tool working surfaces from wear, corrosion, subclass, damage, or the employment of unusual tool/work piece orientations, toolmark reproduction may be incomplete or insufficient, as a result it may not be possible for an examiner to reach a source conclusion. Additionally, some tool manufacturing methods routinely produce working surfaces that leave limited microscopic marks of value. Damaged, corroded, or fragmented items may be of little or no value for comparison purposes.
AJ2L2Q	The three exhibit fired cartridge cases (Items 2, 3 & 4) had all been discharged in the same unknown firearm. Inidicating the presence of second firearm.
AKG9QE	TECHNICAL NOTES: Class characteristics are defined as measurable features of a firearm which indicate a restricted group source. They result from design features and are determined prior to manufacture of the firearm. Individual characteristics are defined as marks produced by the random imperfections or irregularities of firearm surfaces. These random imperfections or irregularities are produced incidental to manufacture and/or caused by use, corrosion, or damage, and are unique to that specific tool. Any conclusions indicating that a toolmark was made by a specific firearm are not to the absolute exclusion of all other firearms because it is not feasible to examine all possible firearms. However, observing this amount of agreement from a different source is considered extremely remote.
AWQXHN	The cartridge cases in Items 2, 3 and 4 were fired in the same gun, based on agreement observed in individual characteristics.
B7AEJF	REMARKS: The method of testing for ammunition components (that have results that fall into the range of conclusions defined below) included physical examination and microscopic comparison. Elimination results that are reported as based on a difference in class characteristics include only physical examination. Identified: Agreement of all discernible class characteristics and sufficient agreement of individual characteristics where the extent of agreement leads to the conclusion that the items were fired in/from the same firearm. Inconclusive (+): Agreement of all discernible class characteristics and some agreement of individual characteristics but insufficient for an identification. Inconclusive: Agreement of all discernible class characteristics without significant agreement or disagreement of individual characteristics; therefore, the items could neither be identified nor eliminated as having been fired in/from the same firearm. Inconclusive (-): Agreement of all discernable class characteristics and some disagreement of individual characteristics, but insufficient for an elimination. Eliminated: Significant disagreement of discernable class characteristics and/or individual characteristics leading to the conclusion that the items were not fired in/from the same firearm.
C2D6TD	Items 2, 3 and 4 are likely to have been fired in the same firearm as there was sufficient agreement found within the rifling's striae. A subclass assessment would need to be undertaken to determine if there is any risk of another firearm having created these marks.
CETM9P	Should any additional firearms be recovered please submit in reference to the above case# [case number not provided]. SUFFICIENT AGREEMENT: “Sufficient agreement” exists between two toolmarks means that the agreement is of a quantity and quality that the likelihood another tool could have made the mark is so remote as to be considered a practical impossibility. Sufficient agreement is related to the significant duplication of random toolmarks as evidenced by a pattern or combination of patterns of surface contours. This report contains conclusions based on the interpretations/opinions of the below signed author. The results contained herein only relate to those items tested.

TABLE 3

WebCode	Additional Comments
CMEHPL	The cartridge cases in Items 2 through 4 were fired in the same gun, based on agreement observed in individual characteristics.
CXEBVR	The identification of the cartridge cases to their respective firearms in this case is made to the practical, not absolute, exclusion of all other firearms. This is because it is not possible to examine all firearms in the world, a prerequisite for absolute certainty. The conclusion that sufficient agreement for identification exists between two firearm-produced toolmarks means that the likelihood another firearm could have made the questioned mark is so remote as to be considered a practical impossibility.
EB4MY8	1. Identification: Based on the agreement of the individual characteristics observed through the microscopic comparison test. [Examiner initials/date]
EPP6M4	Methods: Firearms Function: The make, model, and caliber of a firearm are determined by directly observing manufacturer markings on the firearm in question. When markings are not present, published materials and reference collection firearms may be used to make determinations. Note any pertinent observations such as damage, modifications, improper assembly, accessories, missing parts, broken parts, or defects. Determine if the firearm is suitable for test firing and if so, what test firing methods are appropriate. The firearm is test fired in the received configuration and condition, using appropriate ammunition for case circumstances, and in a manner that determines the functionality of a firearm. Pattern Examination: Toolmarks, whether they are present on evidence items or secondary evidence created in the Laboratory, undergo two stages of comparison. First, the class characteristics are examined and compared. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. Comparative examinations of the impressed and striated toolmarks, in at least two items, are conducted to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) Source Exclusion: Source exclusion is an Examiner's conclusion that two toolmarks did not originate from the same source. This conclusion is an Examiner's opinion that the observed difference(s) in class characteristics provides extremely strong support for the proposition that the two toolmarks came from different sources and extremely weak or no support for the proposition that the two toolmarks came from the same source. A source exclusion based on a minor difference in measured class characteristics requires a verification. 2) Source Identification: Source identification is an Examiner's conclusion that two toolmarks originated from the same source. This conclusion is an Examiner's opinion that all observed class characteristics are in agreement and the quality and quantity of corresponding individual characteristics is such that the Examiner would not expect to find that same combination of individual characteristics repeated in another source. The basis for a source identification conclusion is an Examiner's opinion that the observed class characteristics and corresponding individual characteristics provide extremely strong support for the proposition that the two toolmarks originated from the same source and extremely weak support for the proposition that the two toolmarks originated from different sources. A source identification requires a verification and is the Examiner's opinion that the probability that the two toolmarks were made by different sources is so small that it is negligible. 3) Inconclusive: Inconclusive is an Examiner's conclusion that all observed class characteristics are in agreement but there is insufficient quality and/or quantity of corresponding individual characteristics such that the Examiner is unable to identify or exclude the two toolmarks as having originated from the same source. This conclusion is an Examiner's opinion that there is an insufficient quality and/or quantity of individual characteristics to identify or exclude. Reasons for an inconclusive conclusion include the presence of microscopic similarity that is insufficient to form the conclusion of source

TABLE 3

WebCode	Additional Comments
	identification, or a lack of any observed microscopic similarity. Limitations: Firearms Function: Function testing results describe the operability of a firearm in its current configuration and does not address the statutory requirements regarding criteria for firearms classification. Pattern Examination: Firearms/Toolmark Identification is an empirical science that relies on objective measurements and a subjective comparison of microscopic marks of value. Due to variations in substrate, changes in tool working surfaces from wear, corrosion, subclass, damage, or the employment of unusual tool/work piece orientations, toolmark reproduction may be incomplete or insufficient, as a result it may not be possible for an examiner to reach a source conclusion. Additionally, some tool manufacturing methods routinely produce working surfaces that leave limited microscopic marks of value. Damaged, corroded, or fragmented items may be of little or no value for comparison purposes.
EU2TLF	I am of the opinion that Item 5 could have been discharged from the same firearm as item 1 but different from firearms that discharged bullet items 2, 3 and 5.
F9DDB4	Elimination between #1 (test fires from CZ pistol) and #2 possible only because all the FCCs were the same brand, and the observed differences were observed to be reproducing in the groups (#1 and #5) vs (#2, #3, #4).
FJ24DN	Appendix 01 for Items 001-02 -- 001-04: Beretta, Bersa, Ceska Zbrojovka, Daewoo, Fabrique Nationale, Heckler & Koch, Irwindale Arms/IAI, Kahr Arms, Keltec, Para-Ordnance, Republic Arms, Sigarms, Smith & Wesson, Springfield Inc., STI, Taurus.
FR8N7D	The was inconsistency observed in the test items (1) as repeatability of the drag mark on the firing pin impressions was not consistent on some of the items. In my case Two of the cartridge cases in item 1 didn't have a drag mark while one had.
G22H8M	The identification of the cartridge cases to the respective firearms in this case is made to the practical, not absolute, exclusion of all other firearms. This is because it is not possible to examine all firearms in the world, a prerequisite for absolute certainty. The conclusion that sufficient agreement for identification exists between two firearm-produced toolmarks means that the likelihood another firearm could have made the questioned mark is so remote as to be considered a practical impossibility.
GYFZJP	Several similitudes have been observed during the comparisons between the questioned cartridge cases Item 2,3,4. The most relevant observations have been done during the comparison of the firing pin marks, the firing pin aperture and the breech face marks.
J3PKC3	Test items were marked with a marker not scribed like previous tests. A more permanent marking method would be more helpful for possible mixups.
JD2X34	The method of testing for ammunition components (that have results that fall into the range of conclusions defined below) included physical examination and microscopic comparison. Elimination results that are reported as based on a difference in class characteristics include only physical examination. Identified: Agreement of all discernible class characteristics and sufficient agreement of individual characteristics where the extent of agreement leads to the conclusion that the items were fired in/from the same firearm. Inconclusive: Agreement of all discernible class characteristics without significant agreement or disagreement of individual characteristics; therefore, the items could neither be identified nor eliminated as having been fired in/from the same firearm. Eliminated: Significant disagreement of discernible class characteristics and/or individual characteristics leading to the conclusion that the items were not fired in/from the same firearm.
K2Y2K8	On examination, I found the characteristic marks on the questioned expended cartridge cases

TABLE 3

WebCode	Additional Comments
	(Item 2), (Item 3) and (Item 4) to be similar to each other. Therefore, I am of the opinion that the questioned expended cartridge cases (Item 2), (Item 3) and (Item 4) were fired from the same firearm.
K3BVZ8	The hypothesis that expended cartridge cases item 2, item 3 and item 4 was discharged from an second firearm is very strongly supported.
LAFGVM	LIMITATIONS: 1. Practical Certainty: Since it is not possible to collect and examine samples of all firearms, 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 firearms 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. ATTRIBUTION: All results apply to the items as received and the source information provided.
MFXLFU	Based on the observed similarities in the individual characteristics of TH1, TH2, TH3 compared to each other it is concluded that these cartridge cases were fired with the same firearm.
MGQ6WG	Based on the results obtained in the microscopic study, this laboratory can affirm that two different weapons have participated in the shooting.
PF69J8	In my opinion, a microscopical comparison of firing marks has shown there is sufficient agreement of class and individual characteristic markings to conclusively determine that the cartridge cases, items 2, 3 and 4 were fired in the same firearm.
QFNT6B	There were no exclusionary differences in all discernible class characteristics and sufficient agreement of individual characteristics within the firing pin impressions and breech face marks of the questioned cartridge cases marked 'Item 2', 'Item 3' and 'Item 4', indicating that these three questioned cartridge cases were discharged in the same unknown firearm.
QHD7WU	TECHNICAL NOTES: Class characteristics are defined as measurable features of a firearm or tool, which indicate a restricted group source. They result from design features and are determined prior to manufacture of the firearm or tool. Individual characteristics are defined as marks produced by the random imperfections or irregularities of firearm or tool surfaces. These random imperfections or irregularities can be either produced incidental to manufacture or caused by use, corrosion, or damage, and are unique to that specific tool. Any conclusions indicating that a toolmark was made by a specific firearm or tool are not to the absolute exclusion of all other firearms or tools, because it is not feasible to examine all firearms or tools in the world. However, observing this amount of agreement between different sources is considered extremely remote.
QTJZER	Methods: Pattern Examination: Toolmarks, whether they are present on evidence items or secondary evidence created in the Laboratory, undergo two stages of comparison. First, the class characteristics are examined and compared. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. Comparative examinations of the impressed and striated toolmarks, in at least two items, are conducted to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) Source Exclusion: Source exclusion is an Examiner's conclusion that two toolmarks did not originate from the same source. This conclusion is an Examiner's opinion that the observed difference(s) in class characteristics provides extremely strong support for the proposition that the two toolmarks came from different sources and extremely weak or no support for the proposition that the two

TABLE 3

WebCode	Additional Comments
	toolmarks came from the same source. A source exclusion based on a minor difference in measured class characteristics requires a verification. 2) Source Identification Source identification is an Examiner's conclusion that two toolmarks originated from the same source. This conclusion is an Examiner's opinion that all observed class characteristics are in agreement and the quality and quantity of corresponding individual characteristics is such that the Examiner would not expect to find that same combination of individual characteristics repeated in another source. The basis for a source identification conclusion is an Examiner's opinion that the observed class characteristics and corresponding individual characteristics provide extremely strong support for the proposition that the two toolmarks originated from the same source and extremely weak support for the proposition that the two toolmarks originated from different sources. A source identification requires a verification and is the Examiner's opinion that the probability that the two toolmarks were made by different sources is so small that it is negligible. 3) Inconclusive Inconclusive is an Examiner's conclusion that all observed class characteristics are in agreement but there is insufficient quality and/or quantity of corresponding individual characteristics such that the Examiner is unable to identify or exclude the two toolmarks as having originated from the same source. This conclusion is an Examiner's opinion that there is an insufficient quality and/or quantity of individual characteristics to identify or exclude. Reasons for an inconclusive conclusion include the presence of microscopic similarity that is insufficient to form the conclusion of source identification, or a lack of any observed microscopic similarity. Limitations: Pattern Examination Firearms/Toolmark Identification is an empirical science that relies on objective measurements and a subjective comparison of microscopic marks of value. Due to variations in substrate, changes in tool working surfaces from wear, corrosion, subclass, damage, or the employment of unusual tool/work piece orientations, toolmark reproduction may be incomplete or insufficient, as a result it may not be possible for an examiner to reach a source conclusion. Additionally, some tool manufacturing methods routinely produce working surfaces that leave limited microscopic marks of value. Damaged, corroded, or fragmented items may be of little or no value for comparison purposes.
RCYZCF	There is another firearm, pistol type, cal .40 S&W, incolved in the crime scene.
RRHF2Y	Class characteristics are defined as measurable features of a firearm/tool which indicate a restricted group source. They result from design features and are determined prior to manufacture of the firearm/tool. Individual characteristics are defined as marks produced by the random imperfections or irregularities of firearm/tool surfaces. These random imperfections or irregularities are produced incidental to manufacture and/or caused by use, corrosion, or damage, and are unique to that specific tool. Any conclusions indicating that a toolmark was made by a specific firearm/tool are not to the absolute exclusion of all other firearms/tools because it is not feasible to examine all possible firearms/tools. However, observing this amount of agreement from a different source is considered extremely remote.
RZCKUZ	TECHNICAL NOTES: Class characteristics are defined as measurable features of a firearm which indicate a restricted group source. They result from design features and are determined prior to manufacture of the firearm. Individual characteristics are defined as marks produced by the random imperfections or irregularities of firearm surfaces. These random imperfections or irregularities are produced incidental to manufacture and/or caused by use, corrosion, or damage, and are unique to that specific tool. Any conclusions indicating that a toolmark was made by a specific firearm are not to the absolute exclusion of all other firearms because it is not feasible to examine all possible firearms. However, observing this amount of agreement from a different source is considered extremely remote.

TABLE 3

WebCode	Additional Comments
TJ2C3B	In a case such as this, a cartridge case from Item 1 and a representative sample from Items 2-4 would be entered into NIBIN. Normally we would receive the suspected firearm into the lab and make our own test fires for analysis.
TRPRL2	The cartridges marked with articles 2, 3 and 4 were fired from another .40 caliber pistol.
TZ2ML8	Furthermore, the microscopic comparison revealed that the cartridge cases seized at the scene of crime matched Item 2, Item 3 and Item 4. They were all fired from the same but unknown firearm.
UAXDHU	El indicio 1 (1.1 al 1.3 identificados en el laboratorio) no se realiza conclusión por ser elemento testigo, solo se utiliza para fines de comparación (confronta). Item 1 (1.1 to 1.3 identified in the laboratory) no conclusion is made because they are control elements, they are only used for comparison purposes (confrontation).
UXE9MP	TECHNICAL NOTES: Class characteristics are defined as measurable features of a firearm/tool which indicate a restricted group source. They result from design features and are determined prior to manufacture of the firearm/tool. Individual characteristics are defined as marks produced by the random imperfections or irregularities of firearm/tool surfaces. These random imperfections or irregularities are produced incidental to manufacture and/or caused by use, corrosion, or damage, and are unique to that specific tool. Any conclusions indicating that a toolmark was made by a specific firearm/tool are not to the absolute exclusion of all other firearms/tools because it is not feasible to examine all possible firearms/tools. However, observing this amount of agreement from a different source is considered extremely remote.
V8KCMA	I also compared the three fired cartridges cases (item 2, item 3 and item 4) to each other. I observed a good to excellent correspondence of firing pin shape, size and microscopic detail between the firing pin impressions of these three cartridge cases. I also observed an excellent correspondence of breech face and firing pin aperture marks between these three cartridge cases. In my opinion, this correspondence means that these three fired cartridge cases could have been fired in the same firearm, however they could also have been fired in a different firearm or firearms, which contained firing pins with the same size and shape and microscopic surface detail and with breech faces and firing pin apertures with the same microscopic surface detail. In subjectively assessing the significance of these comparison findings, I have considered the probability of these findings given the following two propositions: Either: The three recovered cartridge cases (item 2, item 3 and item 4) had been fired in the same firearm. Or: The three recovered cartridge cases (item 2, item 3 and item 4) had been fired in a different firearm or firearms. Based on the subjective assessment of the comparison findings, in my opinion, these comparison findings provided extremely strong support for the proposition that these fired cartridge cases had been fired in the same firearm.
VJRXJC	1) Practical Certainty: Since it is not possible to collect and examine samples of all firearms, 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 firearms 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.
VYPBBA	These Items were also microscopically examined against Items 1 and 5. As a result of microscopic examination it was concluded that Items 2 through 4 were not fired in the same firearm as Items 1 and 5. Note: Identification: Agreement of all discernible class characteristics and sufficient agreement of a combination of individual characteristics where

TABLE 3

WebCode	Additional Comments
	the extent of agreement exceeds that which can occur in the comparison of toolmarks made by different firearms/tools and is consistent with the agreement demonstrated by toolmarks known to have been produced by the same firearm/tool. Inconclusive: Agreement of all discernible class characteristics without agreement or disagreement of individual characteristics due to an absence, insufficiency, or lack of reproducibility. Elimination: Significant disagreement of discernible class characteristics and/or individual characteristics. Unsuitable: Unsuitable for examination.
WEAYQR	In my opinion, a microscopical comparison of firing marks has shown that there is sufficient agreement of class and individual characteristic markings to conclusively determine that T2, T3 & T4 were all discharged in the same firearm (Gun 2).
WWQ6XG	Items 1 and 5 were discharged in the same known/recovered suspect's firearm. Items 2, 3 and 4 were all discharged in a second firearm.
XCXHRK	Three of the recovered questioned cartridge cases (Item 2,3,4) are identified to be fired from the same firearm but eliminated to be fired from the same firearm as the known cartridge cases (Item 1).
XD8U4U	Methods: Pattern Examination: Toolmarks, whether they are present on evidence items or secondary evidence created in the Laboratory, undergo two stages of comparison. First, the class characteristics are examined and compared. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. Comparative examinations of the impressed and striated toolmarks, in at least two items, are conducted to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) Source Exclusion: Source exclusion is an Examiner's conclusion that two toolmarks did not originate from the same source. This conclusion is an Examiner's opinion that the observed difference(s) in class characteristics provides extremely strong support for the proposition that the two toolmarks came from different sources and extremely weak or no support for the proposition that the two toolmarks came from the same source. A source exclusion based on a minor difference in measured class characteristics requires a verification. 2) Source Identification: Source identification is an Examiner's conclusion that two toolmarks originated from the same source. This conclusion is an Examiner's opinion that all observed class characteristics are in agreement and the quality and quantity of corresponding individual characteristics is such that the Examiner would not expect to find that same combination of individual characteristics repeated in another source. The basis for a source identification conclusion is an Examiner's opinion that the observed class characteristics and corresponding individual characteristics provide extremely strong support for the proposition that the two toolmarks originated from the same source and extremely weak support for the proposition that the two toolmarks originated from different sources. A source identification requires a verification and is the Examiner's opinion that the probability that the two toolmarks were made by different sources is so small that it is negligible. 3) Inconclusive: Inconclusive is an Examiner's conclusion that all observed class characteristics are in agreement but there is insufficient quality and/or quantity of corresponding individual characteristics such that the Examiner is unable to identify or exclude the two toolmarks as having originated from the same source. This conclusion is an Examiner's opinion that there is an insufficient quality and/or quantity of individual characteristics to identify or exclude. Reasons for an inconclusive conclusion include the presence of microscopic similarity that is insufficient to form the conclusion of source identification, or a lack of any observed microscopic similarity. Limitations: Pattern Examination: Firearms/Toolmark Identification is an empirical science that relies on objective measurements and a subjective comparison of microscopic marks of value. Due to variations

TABLE 3

WebCode	Additional Comments
	in substrate, changes in tool working surfaces from wear, corrosion, subclass, damage, or the employment of unusual tool/work piece orientations, toolmark reproduction may be incomplete or insufficient, as a result it may not be possible for an examiner to reach a source conclusion. Additionally, some tool manufacturing methods routinely produce working surfaces that leave limited microscopic marks of value. Damaged, corroded, or fragmented items may be of little or no value for comparison purposes. Virtual Comparison Microscopy: Virtual Comparison Microscopy (VCM) is restricted to the surface that a three-dimensional toolmark topographical instrument is capable of measuring to produce a digital reproduction. Additionally, individual characteristics may be present on the evidentiary item but may not be reproduced during a scan. This may be due to interference from lacquer/sealant, environmental damage, debris, or measuring limits for an instrument. Furthermore, physical characteristics that are not measurable, such as the metallic qualities of an item, may not be available for evaluation in the digital reproduction.
XDFWNE	The three fired cartridge cases reportedly test fired in the same known firearm (a CZ model 40B pistol) were designated as items 1A, 1B, and 1C by the analyst.
XQDDUE	The cartridges cases No. 2,3 and 4 was discharged from the same firearm different to the suspects firearms Were utiliced two firearms on the scene
XVA87H	The outer evidence seal on the sample pack was broken and also the inner seals on the individual 'pill boxes' when received by this participant (purportedly opened by customs). I also observed that the cartridge cases did not appear to be engraved but in previous proficiency tests that I have seen they were engraved. Request that Items be engraved and a method employed so customs or other entities do not break the seals prior to this participant receiving the samples, such as controlled delivery or X-ray of samples, because integrity of samples received as sent is of great concern.
YGDAVH	Based on differences at the subclass characteristic level, the three cartridge cases associated with Item 1 and the three cartridge cases associated with Items 2, 3, and 4, were excluded from sharing a common origin.
ZCG4TY	I eliminated the fired cartridges cases (Items 2, 3 and 4) from having been fired by the seized CZ 40B pistol. These fired cartridges had been fired within a different firearm (Gun2).
ZQQQ92	SUFFICIENT AGREEMENT: Sufficient agreement exists between two toolmarks means that the agreement is of a quantity and quality that the likelihood another tool could have made the mark is so remote as to be considered a practical impossibility. Sufficient agreement is related to the significant duplication of random toolmarks as evidenced by a pattern or combination of patterns of surface contours.
ZR92WF	The discharged cartridge cases, items 2, 3, and 4, were compared to each other using a comparison microscope. In my opinion, all three cartridge cases were fired in the same firearm, due to agreement of discernible class characteristics and sufficient agreement of individual characteristics. Therefore, based on the microscopy examinations, it is my opinion that two 40 Smith and Wesson caliber firearms were involved in this incident.

-End of Report-
(Appendix may follow)

Collaborative Testing Services ~ Forensic Testing Program

Test No. 23-5261: Firearms Examination

DATA MUST BE SUBMITTED BY **July 24, 2023, 11:59 p.m. EDT** TO BE INCLUDED IN THE REPORT

Participant Code: U1234A WebCode: 6WMTXR

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

Scenario:
Police recovered four expended cartridge cases from a crime scene and seized a CZ 40B Cal. 40 S&W firearm from a suspect's possession who was located later that day. Three rounds of .40 S&W PMC 180 grain FMJ ammunition (consistent with the cartridge cases found at the scene) were test fired with the suspect's firearm and the cartridge cases collected. Investigators are asking you to compare the recovered cartridge cases from the scene with those test fired from the suspect's firearm and report your findings.

Please note the following:
-Each Item is in a small labeled box, it is suggested that when the items are removed from their labeled boxes, they be marked according to your laboratory procedure. However, in case the items are separated from their boxes before labeling has occurred, each item has been marked with its item number.

Items Submitted (Sample Pack F1):
Item 1: Three known expended cartridge cases discharged from the suspect's firearm.
Item 2: Questioned expended cartridge case.
Item 3: Questioned expended cartridge case.
Item 4: Questioned expended cartridge case.
Item 5: Questioned expended cartridge case.

1.) Were any of the questioned expended cartridge cases (Items 2-5) discharged from the same firearm as the known expended cartridge cases (Item 1)?

Item 2	Yes ○	No ○	Inconclusive* ○
Item 3	Yes ○	No ○	Inconclusive* ○
Item 4	Yes ○	No ○	Inconclusive* ○
Item 5	Yes ○	No ○	Inconclusive* ○

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

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

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

3.) Additional Comments

RELEASE OF DATA TO ACCREDITATION BODIES

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

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

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

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

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

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

A2LA Certificate No.

Step 2: Complete the Laboratory Identifying Information in its entirety

Authorized Contact Person and Title

Laboratory Name

Location (City/State)