



Firearms Examination

Test No. 21-5261 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 345 participants and are compiled into the following tables:

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

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

Manufacturer's Information

Each sample set contained five items: Item 1 consisted of three cartridge cases fired from the suspect's gun. Items 2, 3 and 4 each consisted of one cartridge case recovered from the parking lot and Item 5 consisted of one cartridge case recovered from the grass area near the parking lot. PMC® Bronze 40 Auto 180 grain Full Metal Jacket (FMJ) was used for all five items. Participants were requested to determine which, if any, of the recovered questioned cartridge cases (Items 2-5) were fired from the same firearm as the known cartridge cases (Item 1).

The cartridge cases in Item 1 were fired in a Taurus Millennium PT140 PRO (Serial Number SEW24658). Items 2, 3, 4 and 5 were fired in a Springfield XD-40 (Serial Number US248571).

ITEM 1: Multiple magazines were loaded with PMC® Bronze 40 auto ammunition for firing with the Taurus Millennium PT140 PRO 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 inscribed with a "1" (three cartridge cases), then sealed into their respective jewel boxes.

ITEMS 2, 3, 4, and 5 (ELIMINATION): Multiple magazines were loaded with PMC® Bronze 40 for firing with the Springfield XD-40 handgun. After the ammunition was expended, the cartridge cases were collected. This process was repeated until the required number was produced. Out of each batch, the necessary number of cartridge cases was selected and inscribed with a "2" (one cartridge case), "3" (one cartridge case), "4" (one cartridge case), or "5" (one cartridge case), then sealed into their respective jewel boxes.

SAMPLE SET ASSEMBLY: For each sample set, Items 1-5 were placed in a sample pack box. This process was repeated until all of the sample sets were prepared. Once verification was completed, the sample packs were sealed with evidence tape and initialed "CTS."

VERIFICATION: During test production, 10% of the cartridge cases from each batch were selected and intercompared to confirm that markings were consistent. All three 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 Auto 180 grain Full Metal Jacket (FMJ) cartridge cases (Items 2, 3, 4, and 5). They were requested to compare these with three known expended cartridge cases (Item 1) that were fired in the suspect's weapon, a Taurus Millennium PT 140 Pro handgun. For each sample set, the Items 2, 3, 4, and 5 cartridge cases were fired in a different firearm than the Item 1 known cartridge cases. (Refer to Manufacturer's Information for preparation details).

In Table 1 Examination Results, 332 of the 345 responding participants (96.2%) eliminated Items 2, 3, 4, and 5 as having been fired from the same firearm as the Item 1 cartridge cases. Thirteen participants responded "Inconclusive" as to whether Items 2, 3, 4, and 5 were fired from the same firearm 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
22447W	Inc	Inc	Inc	Inc	3FYHUC	No	No	No	No
22QF2P	No	No	No	No	3GHML4	Inc	Inc	Inc	Inc
24AQH2	No	No	No	No	3KX28N	No	No	No	No
264F4H	No	No	No	No	3L9YK7	No	No	No	No
2CKT42	No	No	No	No	3LKXB9	No	No	No	No
2ET4YK	No	No	No	No	3MHBUV	Inc	Inc	Inc	Inc
2FLU96	No	No	No	No	3T7TEX	No	No	No	No
2GX49C	No	No	No	No	3VU6CH	No	No	No	No
2JLZPW	No	No	No	No	46YPXB	No	No	No	No
2JQDFD	No	No	No	No	4864NP	No	No	No	No
2LWZQW	No	No	No	No	49L36U	No	No	No	No
2LXQ6R	No	No	No	No	4CV4LC	No	No	No	No
2QMJLZ	No	No	No	No	4GCRF3	No	No	No	No
2YWLAL	No	No	No	No	4GR2KW	No	No	No	No
36N7W3	No	No	No	No	4LJD87	No	No	No	No
37WJHB	No	No	No	No	4NWQAG	No	No	No	No
38TRTF	No	No	No	No	4QKDQC	No	No	No	No
3D2DHX	No	No	No	No					

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
4UXA4Z	No	No	No	No	7MCVH7	No	No	No	No
4VUFT8	No	No	No	No	7N7NAJ	No	No	No	No
4XGC4H	No	No	No	No	7QDUX6	No	No	No	No
4YCV2D	No	No	No	No	7R6Y6H	No	No	No	No
642NMD	No	No	No	No	7R7QKD	No	No	No	No
6789BD	No	No	No	No	7RJLJQ	No	No	No	No
6ABXYF	No	No	No	No	7TZNFR	No	No	No	No
6BKVEH	No	No	No	No	7Z2TJ4	No	No	No	No
6GAB6B	No	No	No	No	82B6PC	No	No	No	No
6MRY9R	No	No	No	No	82PTUK	No	No	No	No
6MYWR4	No	No	No	No	88D9MX	No	No	No	No
73BQ4D	No	No	No	No	88UHK6	No	No	No	No
74DXV6	No	No	No	No	8AEEZH	No	No	No	No
7739Q4	No	No	No	No	8DHAMR	No	No	No	No
78FJ4B	No	No	No	No	8F4WFF	No	No	No	No
7EGXMQ	No	No	No	No	8KK8JB	No	No	No	No
7H3LDJ	No	No	No	No	8M6K7E	No	No	No	No
7K4RVA	No	No	No	No	8Q9TTH	No	No	No	No
7LWUBX	No	No	No	No	8RH438	No	No	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
8V4GAP	No	No	No	No	ATHZF8	No	No	No	No
92G48Y	No	No	No	No	ATMHE7	No	No	No	No
987LMV	No	No	No	No	AUVLB3	No	No	No	No
99HRVD	No	No	No	No	AZ8ABY	No	No	No	No
9E9L7X	No	No	No	No	B4GTNX	No	No	No	No
9N3PGM	No	No	No	No	B4ZTP3	No	No	No	No
9RDRCQ	No	No	No	No	B77DD3	No	No	No	No
9XGVZ4	No	No	No	No	BD8NT8	No	No	No	No
9YEWB2	No	No	No	No	BEHAHA	No	No	No	No
A3XFQP	No	No	No	No	BEHJ4E	No	No	No	No
A6XT4G	No	No	No	No	BGB4HY	No	No	No	No
ABKF3T	No	No	No	No	BJCFT6	No	No	No	No
ADUJTX	No	No	No	No	BPMFGH	No	No	No	No
AG9X46	No	No	No	No	BXVZCY	No	No	No	No
AGDKWW	No	No	No	No	BYAFQZ	No	No	No	No
AH4Y3L	No	No	No	No	C4H7RK	No	No	No	No
AKC6NM	No	No	No	No	C8FKGV	No	No	No	No
AMWZ4Z	No	No	No	No	C8ZBFH	No	No	No	No
AT9P6W	No	No	No	No	C9VYRB	No	No	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
CA47YK	No	No	No	No	DETXUK	No	No	No	No
CD4AWY	No	No	No	No	DRNXU4	No	No	No	No
CK24N6	No	No	No	No	DTCHCT	Inc	Inc	Inc	Inc
CMT6PM	Inc	Inc	Inc	Inc	DU9A7E	No	No	No	No
CN2FJ6	No	No	No	No	DVLJJK	No	No	No	No
CNG9A2	Inc	Inc	Inc	Inc	DVZCTU	No	No	No	No
CNMQJE	No	No	No	No	DYXHLE	No	No	No	No
CP27YZ	No	No	No	No	E22TVM	No	No	No	No
CPU9FN	No	No	No	No	EE9P73	No	No	No	No
CPYE96	No	No	No	No	EHKQWE	No	No	No	No
CTZDN6	No	No	No	No	EHN9YJ	No	No	No	No
CYLEK9	No	No	No	No	EHTLNZ	No	No	No	No
CYLJTQ	No	No	No	No	EJ4B7R	No	No	No	No
CYRMWG	No	No	No	No	EKVB6N	No	No	No	No
D3YUCC	No	No	No	No	EPUV2K	No	No	No	No
D72P2G	No	No	No	No	EU43CX	No	No	No	No
DAMCR9	No	No	No	No	F3EV8D	No	No	No	No
DEDJGJ	No	No	No	No	F8ZCHX	No	No	No	No
DEQDWJ	No	No	No	No	FCE8HL	No	No	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
FFMGVC	No	No	No	No	H37DKY	No	No	No	No
FFYDZG	No	No	No	No	H6FFA4	No	No	No	No
FH4PXH	No	No	No	No	H7MRZR	No	No	No	No
FPNY7F	No	No	No	No	HALCU4	No	No	No	No
FUVLQ4	No	No	No	No	HDKJ4F	No	No	No	No
FY9C3Q	No	No	No	No	HDNWX4	No	No	No	No
FYUAG7	No	No	No	No	HEX2BR	No	No	No	No
G6DD2Y	No	No	No	No	HGLFXG	No	No	No	No
GAUV62	No	No	No	No	HGN2VH	No	No	No	No
GFAZVW	No	No	No	No	HHEBKP	No	No	No	No
GGUXKV	No	No	No	No	HL22T9	No	No	No	No
GLKJ73	No	No	No	No	HPDZV3	No	No	No	No
GNAVZ	No	No	No	No	HXE4AZ	No	No	No	No
GTLV4K	No	No	No	No	HY3QF9	No	No	No	No
GXAJW6	No	No	No	No	J3JJZZ	No	No	No	No
GXD3LU	No	No	No	No	J9844F	No	No	No	No
GZ4BY4	No	No	No	No	J9LMXL	No	No	No	No
GZE7AA	No	No	No	No	J9NEP2	No	No	No	No
H28EWJ	No	No	No	No	JC8FZF	No	No	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
JKFUZW	No	No	No	No	L84BDL	No	No	No	No
JP88E7	No	No	No	No	LB6CGP	No	No	No	No
JTTNDD	No	No	No	No	LDW84X	No	No	No	No
JV6BYY	No	No	No	No	LGVLRM	No	No	No	No
JXLY3H	No	No	No	No	LKQMKP	No	No	No	No
JZPP8C	No	No	No	No	LL4ZFD	No	No	No	No
K2G6WE	Inc	Inc	Inc	Inc	LT4D92	No	No	No	No
K2Z62P	No	No	No	No	LWMN4K	No	No	No	No
K3EFU3	No	No	No	No	LWP2YU	No	No	No	No
K7WLKB	No	No	No	No	LZ6Q7J	No	No	No	No
K88HZM	No	No	No	No	M2V73D	No	No	No	No
KHRQKB	No	No	No	No	M6XXG7	No	No	No	No
KKY3KK	No	No	No	No	M7Q3KD	No	No	No	No
KUZMMD	No	No	No	No	M9T678	No	No	No	No
KYDC62	No	No	No	No	M9UVEB	No	No	No	No
L2GH2L	No	No	No	No	ME3AAT	No	No	No	No
L2XC4G	Inc	Inc	Inc	Inc	ME6XQ8	No	No	No	No
L7ANFN	No	No	No	No	MFFNVG	Inc	Inc	Inc	Inc
L7D4WV	No	No	No	No	MFV8EE	Inc	Inc	Inc	Inc

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
MG8RGW	No	No	No	No	NUXML4	No	No	No	No
ML4DBK	No	No	No	No	NWC8QP	No	No	No	No
MLG6YV	No	No	No	No	NWX9LL	No	No	No	No
MN7AZF	Inc	Inc	Inc	Inc	P7GX6Q	No	No	No	No
MR7DUM	No	No	No	No	P894C6	No	No	No	No
MVT9EV	No	No	No	No	P8CKEA	No	No	No	No
MW7PQM	No	No	No	No	PERA9B	No	No	No	No
MYU4CC	No	No	No	No	PHPTBA	No	No	No	No
MZ2HJH	No	No	No	No	PPAN2	No	No	No	No
N36NKA	No	No	No	No	PZWRJD	No	No	No	No
N74UAM	No	No	No	No	Q3VFKK	No	No	No	No
NAPMD4	No	No	No	No	QBQHKB	No	No	No	No
NMEL47	No	No	No	No	QDCBL7	No	No	No	No
NMT27L	No	No	No	No	QLMNDA	No	No	No	No
NMUPUQ	No	No	No	No	QNWGNB	No	No	No	No
NR6Y49	No	No	No	No	QPMVY8	No	No	No	No
NRNTEH	No	No	No	No	QT6YPP	No	No	No	No
NRYXNZ	No	No	No	No	QTT3HY	No	No	No	No
NTVBDD	No	No	No	No	QVXTNE	No	No	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
QX2JT9	No	No	No	No	TJGQ9Y	No	No	No	No
QX7WJQ	No	No	No	No	TKN3Y9	No	No	No	No
QXZTK6	No	No	No	No	TKRHGF	No	No	No	No
R3RHG3	No	No	No	No	TT4N67	No	No	No	No
R4NV6G	No	No	No	No	TUC3HR	No	No	No	No
R88UQQ	No	No	No	No	TXEUNJ	No	No	No	No
RAE4UG	No	No	No	No	TYKE9D	No	No	No	No
RBKQ4E	No	No	No	No	TYRDW	No	No	No	No
REMD86	No	No	No	No	U3NFZM	No	No	No	No
RNU2YG	No	No	No	No	UEWB9R	No	No	No	No
RYR7K3	No	No	No	No	UEWFH9	No	No	No	No
T6X6U8	No	No	No	No	ULVXY7	No	No	No	No
T6ZXJT	No	No	No	No	UR42AE	No	No	No	No
TA99NF	No	No	No	No	UTCCKN	No	No	No	No
TAR632	No	No	No	No	UWX7QP	No	No	No	No
TBJY2Q	No	No	No	No	UXBKCD	No	No	No	No
TFFUFJ	Inc	Inc	Inc	Inc	UY4MT2	No	No	No	No
TGRA7E	No	No	No	No	V2MUXF	No	No	No	No
THZQXH	No	No	No	No	V6LDW8	No	No	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
V98ZNV	No	No	No	No	X7BFHD	No	No	No	No
VBY3MW	No	No	No	No	X87YNL	No	No	No	No
VCTMFM	No	No	No	No	XFVRPK	No	No	No	No
VDZ6CX	No	No	No	No	XGVGMN	No	No	No	No
VEB2PP	No	No	No	No	XKQNA6	No	No	No	No
VFTYBM	No	No	No	No	XP9PNP	No	No	No	No
VJAB7H	No	No	No	No	XRBDJE	No	No	No	No
W2ZHFF	No	No	No	No	XVUMEX	No	No	No	No
W4Q8V8	No	No	No	No	Y6UNZG	No	No	No	No
W7CZM2	No	No	No	No	Y6YUUX	No	No	No	No
W9L2T9	Inc	Inc	Inc	Inc	Y8Z6GK	No	No	No	No
WABCJ2	No	No	No	No	YA926A	No	No	No	No
WEDW3T	No	No	No	No	YFDZfZ	No	No	No	No
WH4K7D	No	No	No	No	YFWV9M	No	No	No	No
WRT942	No	No	No	No	YL67DB	No	No	No	No
WTT4VK	No	No	No	No	YMUKPR	No	No	No	No
WUKA3X	No	No	No	No	YT4MRM	No	No	No	No
WXJL34	No	No	No	No	YY3GFM	No	No	No	No
WZD8Z2	No	No	No	No	Z7362L	No	No	No	No

TABLE 1

WebCode	Item 2	Item 3	Item 4	Item 5	WebCode	Item 2	Item 3	Item 4	Item 5
ZFD7ML	No	No	No	No					
ZFRRWN	No	No	No	No					
ZG68LH	No	No	No	No					
ZJR4RN	No	No	No	No					
ZLWRN	No	No	No	No					
ZR7WYD	No	No	No	No					

Response Summary					Participants: 345
<i>Were any of the questioned expended cartridge cases (Items 2-5) discharged from the same firearm as the known expended cartridge cases (Item 1)?</i>					
		<u>Item 2</u>	<u>Item 3</u>	<u>Item 4</u>	<u>Item 5</u>
Responses	Yes	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	No	332 (96.2%)	332 (96.2%)	332 (96.2%)	332 (96.2%)
	Inc	13 (3.8%)	13 (3.8%)	13 (3.8%)	13 (3.8%)

Conclusions

TABLE 2

WebCode	Conclusions
22447W	Items 2, 3, 4, and 5 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, 3, 4, 5 and Item 1 (test fired cartridge cases) were microscopically examined and compared. Agreement of class characteristics was observed. However, there is insufficient agreement or disagreement of individual characteristics to either identify or eliminate Items 2, 3, 4, and 5 as having been fired from the same firearm that fired Item 1 (Taurus Millennium PT140 handgun).
22QF2P	1: Exhibits 1 consists of three .40 S&W fired cartridge cases marketed by PMC. 2: Exhibits 2 through 5 each consist of one .40 S&W fired cartridge case marketed by PMC. 3: Exhibit 1 was microscopically compared to Exhibits 2 through 5. a). Exhibits 2, 3, 4 and 5 were fired in the same firearm based on an agreement of class characteristics and a sufficient agreement of individual characteristics. b). Exhibits 2, 3, 4, and 5 were not fired in the same firearm as Exhibit 1 based on agreement of class characteristics and sufficient disagreement of individual characteristics. Observing this amount of disagreement from the same source is considered extremely remote. 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.
24AQH2	The evidence in items 1 through 5 was examined by physical and microscopic examination. The four fired 40 caliber cartridge cases in items 2 through 5 were determined not to have been fired in the same firearm as the three fired 40 caliber cartridge cases in item 1. The four fired 40 caliber cartridge cases in items 2 through 5 were fired in one weapon. Further analysis is pending submission of another weapon for additional comparison.
264F4H	Items 1-1-1 through 1-5-1 (CTS items 1 through 5) were determined to be 40 S&W caliber fired cartridge cases. These items were determined to be suitable for microscopic comparisons. Due to agreement of all discernible class characteristics, the "known" cartridge cases in item 1-1-1 (CTS item 1) were microscopically compared to each other. These items were determined to have been fired by the same "known" firearm, in the opinion of the laboratory. These identification conclusions were based on sufficient similarities in the patterns of microscopic markings observed among the compared items. Due to agreement of all discernible class characteristics, the items 1-2-1 (CTS item 2), 1-3-1 (CTS item 3), and 1-4-1 (CTS item 4) "questioned" cartridge cases were microscopically compared to item 1-5-1 (CTS item 5) "questioned" cartridge case. These items were determined to have all been fired by the same unknown firearm, in the opinion of the laboratory. These identification conclusions were based on sufficient similarities in the patterns of microscopic markings observed among the compared items. Due to differences in class characteristics, items 1-2-1 through 1-5-1 (CTS items 2 through 5) "questioned" cartridge cases were eliminated as having been fired by the same "known" firearm that fired the "known" cartridge cases in item 1-1-1 (CTS item 1).
2CKT42	The evidence in items 1, 2, 3, 4, and 5 was analyzed by physical and microscopic examination. The four fired 40 caliber cartridge cases in items 2, 3, 4, and 5 were determined

TABLE 2

WebCode	Conclusions
	not to have been fired in the same weapon as the three fired 40 caliber cartridge cases in item 1. The four fired 40 caliber cartridge cases in items 2, 3, 4, and 5 were fired in one weapon. Further analysis is pending submission of a weapon for additional comparison. Item 1 was used for comparison.
2ET4YK	The expanding cartridge cases (item 2-5) were discharged from the same firearm. (which could be an semi-automatic pistol).
2FLU96	In my opinion there is some agreement of class characteristics with no agreement of individual characteristics to conclusively determine that items 2,3,4 and 5 were not fired in the same gun used to generate the samples in item 1.
2GX49C	Examinations showed Items 2, 3, 4 and 5 were discharged within the same unknown firearm. Examinations showed Items 2, 3, 4 and 5 were not discharged in Item 1 due to differences in class characteristics.
2JLZPW	A: The cartridge case described in the items 2, 3, 4, and 5, are .40 S&W caliber, and was fired by a firearm (Identification); it no fired by the firearm used to fire the cartridges cases described in the item 1. B: The cartridge cases described in the Item: 1, are .40 S&W caliber, were fired by the same firearm (Identification).
2JQDFD	Items 2-5 were microscopically eliminated as having been fired in the same firearm that reportedly the Item 1 test fires due to disagreement of discernible individual characteristics. Items 2-5 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.
2LWZQW	Items 2, 3, 4 and 5 were fired in the same firearm; however, they were not fired in the same firearm as the item 1 test fires.
2LXQ6R	Exhibits 2 through 5 were fired from the same unknown firearm based on sufficient agreement of individual characteristics observed. Exhibits 2 through 5 were not fired from the same firearm used to fire the test fires described in exhibit 1 (knowns) based on differences of individual characteristics observed.
2QMJLZ	After microscopic comparison, it was determined that Items# 2, 3, 4, and 5 were NOT discharged in Item# 1 based on differences of class and individual characteristics. After microscopic comparison, it was determined that Items# 2, 3, 4, and 5 were fired in the same firearm based on sufficient agreement of class and individual characteristics of the breech face, firing pin and firing pin aperture shear marks.
2YWLAL	The Item 2, 3, 4, and 5 cartridge cases are eliminated as having been fired in the same firearm that fired the Item 1 cartridge cases. The Item 2, 3, 4, and 5 cartridge cases are all identified as having been fired in the same unknown firearm.
36N7W3	CARTRIDGE CASES: Items 1, 2, 3, 4 and 5. The cartridge cases Items 2, 3, 4 and 5 were Identified as having been fired in the same firearm. They were Eliminated from the Item 1 cartridge cases (known test fires).
37WJHB	The cartridge cases, Items 01-01, 01-02, and 01-03 were all fired in the same firearm which would need to be able to chamber and fire a 40 S&W cartridge. A possible firearm manufacturer was not determined. The cartridge cases, Items 01-04, 01-05, 01-06, and 01-07 were not fired in the same firearm as Items 01-01, 01-02, and 01-03. Items 01-04, 01-05, 01-06, and 01-07 were all fired in the same unknown firearm which would need to be able to chamber and fire a 40 S&W cartridge. A possible firearm manufacturer was not determined.

TABLE 2

WebCode	Conclusions
38TRTF	I observed an excellent correspondence of firing pin shape and the microscopic detail between the firing pin impressions of the recovered cartridge cases (items 2, 3, 4 and 5). I also observed an excellent correspondence of the microscopic detail of the firing pin aperture shear marks between items 2, 3 and 5. Therefore in my opinion, the recovered cartridge cases (items 2 to 5) were fired in the same firearm. The firing pin impressions and the firing pin aperture marks of the test-fired cartridge cases (item 1) were different to item 2. Therefore in my opinion, the recovered cartridge cases (items 2 to 5) had not been fired in the suspect's firearm.
3D2DHX	The .40S&W caliber discharged cartridge casings mentioned in items 2,3,4 and 5 were all fired by the same unknown weapon, not the weapon that fired the tests in item 1
3FYHUC	Questioned expended cartridge cases (Items 2-5) were discharged from the same firearm, but not from the known firearm (suspects' weapon).
3GHML4	Items 2 through 5 are identified as having been fired from the same firearm. Note: Identifications are made only to a degree of practical certainty and are based on sufficient agreement of the individual characteristics of tool marks. When sufficient agreement exists, in part, this means that the likelihood of another tool producing the same marks is so remote that it is considered a practical impossibility. Items 2 through 5 are not identified or eliminated (inconclusive) as having been fired from the same firearm as items 1A thru 1C. The individual characteristics present did not display agreement. Differences in individual characteristics would suggest that items 2 through 5 were fired from a different firearm.
3KX28N	1: Items 2, 3, 4 and 5 were not fired in the firearm that fired Item 1. 2. Items 2, 3, 4 and 5 were fired in the same firearm.
3L9YK7	Comparisons performed between the test fired spent cartridge cases (Item 1) and the spent cartridge cases (Items 2-5) resulted in an exclusion. The spent cartridge cases (Items 2-5) were NOT fired in the same firearm as the test fired spent cartridge cases (Item 1).
3LKXB9	[No Conclusions Reported.]
3MHBUV	Items 2, 3, 4, and 5 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, 3, 4, 5 and Item 1 (the test fired cartridge cases) were microscopically examined and compared. Agreement of class characteristics was observed. However, there is insufficient agreement or disagreement of individual characteristics to either identify or eliminate the cartridge cases as having been fired in the same firearm that fired Item 1 (Taurus semiautomatic pistol).
3T7TEX	1). Examinations showed the four (4) cartridge cases, listed as Item 2, Item 3, Item 4 and Item 5, were NOT discharged within the firearm that discharged Item 1. 2). Examinations showed the four (4) cartridge cases, listed as Item 2, Item 3, Item 4 and Item 5, were discharged within the SAME UNKNOWN firearm.
3VU6CH	The item 2, 3, 4 and 5 cartridge cases are eliminated as having been fired in the same firearm that fired the item 1 cartridge cases. The item 2, 3, 4 and 5 cartridge cases are identified as having been fired in the same unknown firearm.
46YPXB	Items 001-02 through 001-05 were not fired in the same firearm as Item 001-01 (elimination). This is also the opinion of Firearms Examiner. Items 001-02 through 001-05 were fired in the same firearm (identification). This is also the opinion of Firearms Examiner.
4864NP	1: Exhibit 1 (test fires) and Exhibits 2, 3, 4, and 5 40 S&W caliber (cartridge cases) with

TABLE 2

WebCode	Conclusions
	headstamps labeled "PMC 40 S&W". 2: Microscopic comparison revealed Exhibits 2 through 5 (cartridge cases) were fired in the same firearm based on a sufficient agreement of class and individual characteristics. 3: Microscopic comparison revealed Exhibit 1 (test fires) and Exhibits 2 through 5 (cartridge cases) were not fired in the same firearm based on an agreement of class characteristics and a sufficient disagreement of individual characteristics. Observing this amount of disagreement from the same source is considered extremely remote.
49L36U	QC2-5 (items 2-5) and TC1A (item 1) are an elimination. This means in the opinion of this examiner specimens QC2-5 were eliminated as having been fired in specimen QF1 (TC1A).
4CV4LC	Cartridge cases P-2, P-3, P-4 and P-5 were fired by the same firearm, they weren't fired by Taurus Millennium PT140 Pro handgun identified as K-1.
4GCRF3	Items 2-5: These cartridge cases have been compared microscopically with each other. Based on the agreement of all discernible class characteristics and a sufficient agreement of corresponding individual characteristics they have been identified as having been fired in the same firearm. Items 1 and 2: These cartridge cases have been compared microscopically with each other. Based on the agreement of all discernible class characteristics and sufficient disagreement in individual characteristics they are eliminated from being fired in the same firearm.
4GR2KW	The items 2, 3, 4 and 5 fired cartridge cases were not fired in the same firearm as the item 1 fired cartridge cases. The items 2 and 3 fired cartridge cases were fired in the same firearm but not the same firearm as the other submitted fired cartridge cases. The items 4 and 5 fired cartridge cases were fired in the same firearm but not the same firearm as the other submitted fired cartridge cases.
4LJD87	Items 001-02 through 001-05 were eliminated to Item 001-01, based on the disagreement of individual characteristics observed in the firing pin impression. Items 001-02 through 001-05 were identified as having been fired from the same unknown firearm, based on the agreement of class characteristics, and individual characteristics observed in the firing pin impression.
4NWXAG	Using comparison microscopy, a difference in individual characteristics was observed. Therefore, the cartridge cases (items 2,3,4,5) could not have been fired from the same firearm as the cartridge case (item 1).
4QKDQC	The test fired cartridge cases in Item 1 were microscopically compared to the fired cartridge cases listed as Items 2, 3, 4, and 5. It was determined that the fired cartridge cases (Items 2, 3, 4 & 5) were not fired in the suspect's weapon. Items 2, 3, 4, and 5 were all fired in the same unknown firearm capable of chambering and firing caliber .40 S&W ammunition.
4UXA4Z	Cartridge cases, item 2, item 3, item 4 and item 5 were not fired from the suspect's weapon.
4VUFT8	The fired cartridge cases in Submissions #1b through #1e 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. The fired cartridge cases in Submissions #1b through #1e were microscopically compared and eliminated as having been fired from the same unknown firearm as the cartridge cases in Submission #1a based on sufficient difference in individual characteristics present.
4XGC4H	Casings M (Item 2) through P (Item 5) were identified as being fired in the same firearm. Suspect Weapons are unknown at this time. Casings M (Item 2) through P (Item 5) were not fired in the same firearm as the Item 1 test fires, indicated as being fired in a Taurus Millennium PT140, based on differences in individual characteristics.
4YCV2D	The exhibit fired cartridge cases (Item 2-5 inclusive) were not discharged in the exhibit firearm

TABLE 2

WebCode	Conclusions
	(Item 1).
642NMD	Item 1 through Item 5 are seven (7) cartridge cases bearing the headstamp of Poongsan Metal Corporation (PMC). The Item 2 through Item 5 cartridge cases were identified as having been fired in the same firearm. The Item 1 cartridge cases were excluded as having been fired in the same firearm that fired the Item 2 through Item 5 cartridge cases.
6789BD	The below listed spent cartridge cases were macroscopically and microscopically examined and compared with test fires (Lab Evidence# 001-A1) from the Taurus PT140 Pro 40 S&W handgun, Property# 21-5261. It is my opinion that these items were not fired from this firearm (elimination). The below listed spent items were further microscopically compared to each other. It is my opinion that the below listed items were fired from the same unknown firearm. (identification). Property# Lab Evidence# Item# Item Description: 21-5261 001-A2 2 Spent PMC 40 S&W cartridge case, 21-5261 001-A3 3 Spent PMC 40 S&W cartridge case, 21-5261 001-A4 4 Spent PMC 40 S&W cartridge case, 21-5261 001-A5 5 Spent PMC 40 S&W cartridge case.
6ABXYF	The cartridge cases in Items 2 through 5 were not fired in the gun that fired the cartridge cases in Item 1, based on differences observed in class characteristics.
6BKVEH	The cartridge cases Items 2, 3, 4, and 5 were all microscopically identified as having been fired in the same firearm. The cartridge case Item 4 was not fired in the same firearm as the cartridge case Item 1A (test).
6GAB6B	The fired cartridge cases (Items 2, 3, 4 and 5) were examined and microscopically compared to the test fired cartridge cases from the Taurus pistol (Item 1 - suspect's weapon). It was determined that although there was class characteristics in agreement, there was disagreement to individual characteristics on the fired cartridge cases to the test fired cartridge cases from the Taurus pistol. Therefore, none of the fired cartridge cases were fired in the Taurus pistol (suspect's weapon). The fired cartridge cases were microscopically compared to each other and it was determined that all of the fired cartridge cases (Items 2, 3, 4 and 5) were fired in the same unknown weapon capable of chambering and firing .40S&W caliber ammunition.
6MRY9R	The four (4) PMC .40S&W brand vanillas, recovered at the scene, corresponding to the Items 2,3,4 and 5 marked with the same numbers, were not struck by the mechanisms of the pistol type firearm, brand TAURUS, model MILLENNIUM PT140 PRO, caliber .40 S&W. Result of the comparative study: NOT UNIPROCEDENT (Negative check).
6MYWR4	Examinations showed Items 2 through 5 were not discharged within the same firearm as the known expended cartridge cases (Item 1).
73BQ4D	The Item 2 through 5 cartridge cases were identified, within the limits of practical certainty, as having been fired in the same firearm. The Item 2 through 5 cartridge cases were eliminated as having been fired in the handgun that fired the Item 1 cartridge cases.
74DXV6	The Items 2 through 5 fired .40 S&W cartridge cases and the Item 1 test fired .40 S&W cartridge cases were examined and microscopically compared to each other with the following results: Items 2 through 5 were identified as having been fired in the same unknown .40 caliber firearm. Items 2 through 5 were eliminated as having been fired in the same firearm as the Item 1 test fires based on differences in individual characteristics. Remarks: Identification: The opinion of a qualified examiner that there is sufficient agreement of features and detail to conclude that two or more toolmarks originated from the same source. Elimination: The opinion of a qualified examiner that there is sufficient disagreement of features and detail to conclude that two or more toolmarks did not originate from the same source.

TABLE 2

WebCode	Conclusions
7739Q4	The four expended 40 S&W cartridge cases (Items 2-5) are identified as being fired in a single firearm. These expended cartridge cases are eliminated from being fired in the suspect's Taurus Millennium PT140 Pro (Item 1 test fires).
78FJ4B	Items 1 through 5 are .40 S&W caliber cartridge cases bearing the headstamp of PMC ammunition. The Item 2 through 5 cartridge cases were identified as having been fired in the same firearm, but were excluded as having been fired in the same firearm as the Item 1 cartridge cases.
7EGXMQ	The four incriminated .40 S&W caliber cartridge cases described in this report in items (2,3,4 and 5) are not uniproced with the .40 S&W caliber cartridge cases described in item 1 as standard or reference samples taken from the weapon of suspicious pistol type fire Grand Taurus Millennium PT 1401 Pro.
7H3LDJ	Items 2, 3, 4, 5, and their casts were intercompared using a comparison microscope. Agreement of class and individual characteristics sufficient for identification were observed. Items 2, 3, 4, and 5 were fired in the same firearm. Item 2 and its cast were microscopically compared to Items 1-1, 1-2, 1-3, and their casts using a comparison microscope. Although class characteristics agreed, significant disagreement in individual characteristics was observed to conclude Item 2 was not fired in the Taurus pistol. Item 3 and its cast were microscopically compared to Items 1-1, 1-2, 1-3, and their casts using a comparison microscope. Although class characteristics agreed, significant disagreement in individual characteristics was observed to conclude Item 3 was not fired in the Taurus pistol. Item 4 and its cast were microscopically compared to Items 1-1, 1-2, 1-3, and their casts using a comparison microscope. Although class characteristics agreed, significant disagreement in individual characteristics was observed to conclude Item 4 was not fired in the Taurus pistol. Item 5 and its cast were microscopically compared to Items 1-1, 1-2, 1-3, and their casts using a comparison microscope. Although class characteristics agreed, significant disagreement in individual characteristics was observed to conclude Item 5 was not fired in the Taurus pistol.
7K4RVA	Items 2 through 5 (cartridge cases) were each fired in the same firearm; however, they were not fired in the firearm which fired item 1 (test fired cartridge cases).
7LWUBX	Item 1: The cartridge cases were visually inspected. Items 2, 3, 4, and 5 The cartridge cases were Identified to each other. They were Eliminated from Item 1.
7MCSVH7	Before examination the cartridge cases recovered after a shooting outside of a nightclub 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 similarities in the individual characteristics of TH1, TH2, TH3 and TH4 compared to VG1, VG2 and VG3 it is concluded that none of the recovered questioned cartridge cases were fired with the suspect's firearm.
7N7NAJ	Items 2, 3, 4 & 5 The cartridge cases were Identified to each other. The cartridge cases were Eliminated to the firearm represented by the Item 1 tests.
7QDUX6	Item #1 test fires and Items #2, #3, #4, and #5 were microscopically examined and compared. Based on the observed disagreement of class and individual characteristics, Item #1 test fires and Items #2, #3, #4, and #5 are eliminated as having been fired in the same firearm. Items #2, #3, #4, and #5 were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their

TABLE 2

WebCode	Conclusions
	individual characteristics, Items #2, #3, #4, and #5 are identified as having been fired in the same firearm. The evidence will be returned to the submitter.
7R6Y6H	The four 40 S&W cartridge cases (items 2, 3, 4, and 5) are identified as having been fired in the same firearm. Agreement of the characteristics is sufficient to determine that the four casings were fired in the same firearm. The four 40 S&W cartridge cases (items 2, 3, 4, and 5) are excluded as having been fired in the same firearm as the three 40 S&W cartridge cases discharged from the suspects firearm (item 1). Differences were found in characteristics sufficient to exclude the casings as having been fired in the same firearm.
7R7QKD	Items 1, 2, 3, 4 and 5 exhibit the same discernable class characteristics; however, microscopic examination revealed sufficient differences in individual characteristics to eliminate Items 2, 3, 4 and 5 as having been fired in the same firearm as the Item 1 fired cartridge cases.
7RJLJQ	Four expended cartridge cases shot from a single weapon, other than from the suspect's weapon.
7TZNFR	The four (4) discharged cartridge casings mentioned in items 2, 3, 4, & 5 were all fired by the same unknown weapon, but not the weapon that fired the test firings in item 1.
7Z2TJ4	The fired cartridge cases of items #2, 3, 4, and 5 were eliminated from having been fired in the same firearm as the fired cartridge cases of item #1 due to significant differences in individual characteristics. The fired cartridge cases of items #2, 3, 4, and 5 were microscopically identified as having been fired in the same unknown firearm.
82B6PC	Cartridge Case Analysis: Methodology: Physical (Visual Examination), Microscopy (Comparison Microscope). Items 2, 3, 4, and 5, the cartridge cases, were not fired in Item 1, the Taurus pistol, based upon different class and individual characteristics. Items 2, 3, 4, and 5, the cartridge cases, were fired in the same firearm based upon corresponding class and individual characteristics.
82PTUK	Items 2, 3, 4, and 5 were Identified to each other. Items 2, 3, 4, and 5 were Eliminated to the Item 1 representative agency test fires.
88D9MX	Expended cartridge cases, Items 2, 3, 4, and 5, were determined not to have been fired in the firearm which discharged Item 1 (test fires).
88UHK6	The three submitted cartridge cases, Agency Exhibit 1, were all fired in the same firearm, reportedly from a Taurus Millennium PT140 Pro pistol. The four submitted fired cartridge cases, Agency Exhibit 2 to 5, were all fired in the same unknown firearm. They were eliminated as having been fired in the same firearm as the three submitted fired cartridge cases, Agency Exhibit 1, reportedly fired in a Taurus Millennium PT140 Pro pistol, due to differences in individual characteristics. A possible firearm type could not be determined due to commonly seen class characteristics.
8AEEZH	Items 2 through 5 were Identified to each other. Items 2 through 5 were Eliminated to the Item 1 pistol.
8DHAMR	A:The cartridge cases described in Items: 2,3,4 and 5, are .40S&W caliber, were fired by the same firearm (Identification). B:The cartridge cases described in Items: 1, are .40S&W caliber, were fired by the same firearm (Identification).
8F4WFF	The recovered spent cartridge cases in items 001-B through 001-E (CTS Items 2 through 5) were microscopically examined and compared to each other. It was determined that all four spent cartridge cases were fired from the same firearm. These spent cases were then microscopically compared to the test fired cartridge cases in item 001-A (CTS Item 1). It was

TABLE 2

WebCode	Conclusions
	determined that the recovered spent casings in items 001-B through 001-E were not fired in the same firearm as the test fired cartridge cases in item 001-A. The evidence in item 001 is being retained in the Firearms section of the Laboratory. Findings were reviewed and verified, F.E. Analysis commenced on 6-28-21 and was completed on 7-02-21. An identification determination is centered on the existence of sufficient class and individualizing characteristics in agreement between a questioned and known, is founded on scientific principles and based on the examiner's training, knowledge, skill and experience.
8KK8JB	An examination shows the exhibit fired cartridge cases contained in Items 2 to 5 had not been fired in the exhibit Taurus Millennium PT140 Pro pistol.
8M6K7E	Spent cartridge cases identification number 2, 3, 4 and 5 collected from the scene, were not fired in the chamber of the Taurus millennium PT140 PRO pistol, seized by the police from a suspect.
8Q9TTH	Items 2 to 5 were fired from the same unknown firearm. They were not fired from the Item 1 Taurus pistol.
8RH438	Lab Items 001-02 - 001-05 were not fired in the same firearm as Lab Item 001-01 (elimination). This is also the opinion of Firearms Examiner.
8V4GAP	The cartridge cases of Item 1 (three 40 S&W caliber cartridge cases said to be test fired from a Taurus Model Millennium PT140 Pro pistol) were fired in a different firearm than Items 2, 3, 4 and 5 (four 40 S&W caliber cartridge cases). Items 2, 3, 4 and 5 were identified as having been fired in the same firearm. Source identification is reached when the discernable class and individual characteristics have corresponding detail and the examiner would not expect to see the same arrangement of details repeated in another source.
92G48Y	The cartridge cases, Items 2, 3, 4 and 5 were not fired in the same firearm as the test fires, Item 1.
987LMV	It was determined that the Item 2-5 cartridge cases were all fired in the same firearm, which was NOT the same firearm that was used to fire the Item 1 cartridge cases.
99HRVD	Four crime empties marked as C2, C3, C4 and C5 respectively were "not fired" from recovered known weapon in question. Test empties fired from the known recovered weapon in question were submitted for the comparison duly marked as T1, T2 and T3 respectively.
9E9L7X	Examinations showed that Item 2, Item 3, Item 4 and Item 5 were not discharged within the same firearm as Item 1.
9N3PGM	The following exhibits were visually examined: Exhibit 1: Three cartridge cases. Exhibit 2: Cartridge case. Exhibit 3: Cartridge case. Exhibit 4: Cartridge case. Exhibit 5: Cartridge case. 1: Exhibits 1-5 are 40 S&W cartridge cases and were microscopically compared to determine whether they were fired in the same firearm. 2: The Exhibit 1 cartridge cases were fired in the same firearm based on agreement of all discernible class characteristics and sufficient agreement of individual characteristics for identification. 3: The cartridge cases in Exhibits 2, 3, 4, and 5 were fired in the same firearm based on agreement of all discernible class characteristics and sufficient agreement of individual characteristics for identification. 4: The Exhibit 2 through 5 cartridge cases were not fired in the same firearm as the Exhibit 1 cartridge cases based on agreement of all discernible class characteristics and sufficient disagreement of individual characteristics for elimination. Observing this amount of disagreement from a different source is considered extremely remote. Technical Note: Class characteristics are defined as measurable features of a firearm/tool which indicate a restricted group source. They result from design features and are determined prior to manufacture of the

TABLE 2

WebCode	Conclusions
	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.
9RDRCQ	The same firearm was used to discharge Items 2, 3, 4 and 5. This was not the same firearm that was used to discharge the three cartridge cases that comprised Item 1.
9XGVZ4	Items 001-02, 001-03, 001-04 and 001-05 were microscopically examined in conjunction with one another. Based on these microscopic comparisons, Items 001-02, 001-03, 001-04 and 001-05 were all identified as having been fired in the same unknown firearm. Items 001-02, 001-03, 001-04 and 001-05 were microscopically examined in conjunction with the Item 001-01 test fired cartridge cases. Based on these microscopic comparisons, Items 001-02, 001-03, 001-04 and 001-05 were all eliminated as having been fired from the same firearm as the Item 001-01 test fired cartridge cases.
9YEWB2	Items 2 through 5 cartridge cases were examined and found upon microscopic comparison to have been discharged in the same unknown .40 S&W pistol. These identifications are based on an agreement of both class and individual characteristics. Items 2 through 5 cartridge cases were examined and found not to have been discharged in the Item 1 Taurus pistol. These eliminations are based on a difference in class characteristics.
A3XFQP	Items 2, 3, 4 and 5 were fired in the same firearm; however, they were not fired in the same firearm as the item 1 test fires.
A6XT4G	Items 1A through 1C were Identified to each other. Items 2 through 5 were Identified to each other. Items 1A through 1C were Eliminated to Items 2 through 5.
ABKF3T	Four questioned expended cartridge cases (Items 2-5) were not discharged from the same firearm as the known expended cartridge cases (Item 1). Four cartridge cases (Items 2-5) were discharged from the same firearm.
ADUJTX	The test fired cartridge cases (Item 1) and the fired cartridge cases (Items 2, 3, 4 & 5) were microscopically examined and compared. Based on the observed disagreement of their class and individual characteristics, the cases (Items 2, 3, 4 & 5) are eliminated as having been fired in the Taurus pistol. The fired cartridge cases (Items 2 and 5) were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items 2 and 5 are identified as having been fired in the same firearm. The fired cartridge cases (Items 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 3 and 4 are identified as having been fired in the same firearm.
AG9X46	There is sufficient agreement of a combination of class characteristics and some detectable individual characteristics between expended cartridge case items 2, 3, 4 and 5. In my opinion, Items 2 to 5 were discharged from the same firearm but different from the one that discharged expended cartridge cases items 1.
AGDKWW	Items 2, 3, 4, and 5 were eliminated as having been fired in the same firearm as the Item 1 test fires due to differences in individual characteristics. Items 2, 3, 4, and 5 were identified as having been fired in the same unknown firearm based upon sufficient agreement of individual characteristics.

TABLE 2

WebCode	Conclusions
AH4Y3L	Items 2 through 5 were fired in the same firearm; however, they were not fired in the same firearm as the item 1 test fires.
AKC6NM	The submitted specimen marked as Item 1 was examined and determined to be (3) fired 40 S&W caliber cartridge cases with PMC headstamps, said to have been "discharged from the suspect's weapon". The submitted specimens marked as Items 2-5 were examined and determined to be four (4) fired 40 S&W caliber cartridge cases with PMC headstamps. Items 2-5 were microscopically inter-compared and compared to the Item 1 fired cartridge cases. As a result of microscopic comparison, it was concluded that Items 2-5 were identified as having been fired in the same unknown firearm. As a result of microscopic comparison, it was concluded that Items 2-5 were eliminated as having been fired in the same firearm as Item 1 due to differences in class and individual characteristics.
AMWZ4Z	The Items 2 through 5 fired 40 S&W cartridge cases and the Item 1 test fires were examined and microscopically compared to each other with the following results: Items 2 through 5 were identified as having been fired in the same unknown firearm. Items 2-5 were eliminated from having been fired in the same firearm as the Item 1 test fires due to significant differences in class and individual characteristics.
AT9P6W	#1.1 - #1.5: These cartridge cases were compared microscopically with each other. They have agreement in all discernible class characteristics. There is sufficient disagreement in individual characteristics for elimination. #1.1 were fired in a different firearm than #1.2-#1.5. #1.2- #1.5 These cartridge cases have sufficient agreement in corresponding individual characteristics for identification. These four (4) cartridge cases were fired in the same firearm.
ATHZF8	Item 1 consists of three .40 S&W caliber cartridge cases which bear the headstamp of PMC ammunition. Items 2 through 5 are .40 S&W caliber cartridge cases which bear the headstamp of PMC ammunition. The Item 2 through 5 cartridge cases were identified as having been fired in the same firearm. The Item 1 cartridge cases were eliminated from having been fired in the same firearm as the Item 2 through 5 cartridge cases, due to a difference in class characteristics.
ATMHE7	Items 2 through 5 were eliminated as having been fired in the same firearm as Item 1.
AUVLB3	The four 40 Smith & Wesson caliber cartridge cases (2 – 5) were fired in the same unknown firearm. The four 40 Smith & Wesson caliber cartridge cases (2 – 5) were not fired in the Taurus Millennium PT140 Pro pistol (1).
AZ8ABY	1: Examinations showed Items 2, 3, 4, and 5 were not discharged within the same firearm as Item 1. 2: Examinations showed Items 2, 3, 4, and 5 were discharged within the same unknown firearm.
B4GTNX	The questioned Items 2-5 fired cartridge cases were microscopically intercompared and due to sufficient agreement of class and individual characteristics it was concluded that Items 2-5 were fired in the same (unknown) firearm. The questioned Items 2-5 fired cartridge cases were then compared to the Item 1 (known) test fired cartridge cases and due to differences in class and individual characteristics it was concluded that Items 2-5 were not fired in the same firearm as the Item 1 fired cartridge cases.
B4ZTP3	The submitted fired cartridge cases (Items 2 through 5) were fired in the same unknown firearm. The submitted fired cartridge cases (Items 2 through 5) were eliminated as having been fired in the same firearm as the test fires (Item 1) reportedly fired in a Taurus Millennium PT140 Pro pistol due to difference in corresponding repeatable markings. The submitted fired

TABLE 2

WebCode	Conclusions
	cartridge cases (Items 2 through 5) were fired in a firearm capable of chambering and firing a .40 S&W caliber cartridge. Due to commonly seen class characteristics, a possible firearm manufacturer was not determined.
B77DD3	Three of the 40 Smith & Wesson caliber cartridge cases (1) were fired in the same unknown firearm. Four of the 40 Smith & Wesson caliber cartridge cases (2 to 5) were fired in the same unknown firearm. Three of the 40 Smith & Wesson caliber cartridge cases (1) were not fired in the same unknown firearm as four of the 40 Smith & Wesson caliber cartridge cases (2 to 5).
BD8NT8	The Taurus Millennium PT140 Pro (Item 1) was eliminated from having discharged the fired cartridge cases (Items 2 to 5) (Elimination).
BEHAHA	The Item 1, 2, 3, 4, and 5 cartridge cases were microscopically examined. The Item 2, 3, 4, and 5 PMC brand caliber 40 Smith & Wesson cartridge cases were identified as having been fired in the same firearm based on corresponding class and individual characteristics. The Item 2, 3, 4, and 5 cartridge cases were eliminated as having been fired in the firearm represented by the Item 1 cartridge cases due to differences in class and individual characteristics.
BEHJ4E	The visual and microscopic analyses of the evidence cartridge cases Q1 through Q4 and test fires from K1 were performed starting June 7, 2021 and the results of the comparisons and evaluations are as follows: Based on agreement of class characteristics and sufficient agreement of individual characteristics, Q1 through Q4 were identified as having been fired with the same unknown firearm. Based on significant disagreement of individual characteristics, Q1 through Q4 were eliminated as having been fired by K1. Should any additional suspect firearm(s) be recovered, please submit and reference the above CC#. The listed evidence will be retained in the Firearm Analysis Unit's Firearms Evidence Vault. "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.
BGB4HY	The test fires marked #1 were microscopically examined and compared to the four shells marked #2, #3, #4 and #5. The four shells marked #2, #3, #4, #5 were eliminated as having been fired from the same pistol as the #1 test fires. The four shells #2, #3, #4, and #5 were examined and compared to each other with positive results. The four shells marked #2, #3, #4, and #5 were discharged in the same unknown firearm.
BJCFT6	CONCLUSION: Los cuatro casquillos calibre .40 S&W, identificados como Item 2, Item 3, Item 4 e Item 5, fueron percutidos por una misma arma de fuego, diferente al arma de fuego que percutió los tres casquillos del mismo calibre identificados como Item 1. INGLÉS The four empty bullet casings caliber .40 S&W, identified as item 2, item 3, item 4 and item 5, were struck by the same fire arm; which is different to the fire arm that struck the three empty bullet casings, caliber .40 S&W, identified as item 1.
BPMFGH	Item's 2, 3, 4 and 5 were fired from the same unknown firearm. These findings are based on corresponding individual characteristics. Item's 2, 3, 4, and 5 were eliminated as having been fired from the known firearm that fired the Item 1 cartridge casings. These finding are based on differences in individual characteristics.
BXVZCY	The four 40 S&W cartridge cases (items 2, 3, 4, and 5) were NOT fired in the Taurus Millennium PT140 pistol. The four 40 S&W cartridge cases (items 2, 3, 4, and 5) had agreement of all discernable class characteristics. They also had agreement of microscopic markings in the firing pin aperture shear marks that would be of sufficient quality and quantity to identify these four cartridge cases as having been fired from the same firearm, assuming the

TABLE 2

WebCode	Conclusions
	markings are individual in nature, and not from subclass carryover. Subclass carryover may occur in some manufacturing processes, such as firearm breech face manufacturing. These processes have the potential to produce multiple units with carryover of fine detail from the tooling to the manufactured items. Without the firearm to evaluate, I was unable to eliminate the possibility of subclass markings on the cartridge cases. Therefore, it is possible that the submitted cartridge cases (items 2, 3, 4, and 5) were fired from the same firearm, or in a limited number of firearms manufactured using the same tooling at or near the same time. If a firearm is submitted, I can revisit this examination.
BYAFQZ	Items #2, #3, #4 and #5 were microscopically examined and compared. Based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics, Items #2, #3, #4 and #5 are identified as having been fired from the same firearm. Items #2, #3, #4 and #5 were microscopically examined and compared to Item #1 (test fires). Based on the observed disagreement of their individual characteristics, Items #2, #3, #4 and #5 are eliminated as having been fired from the same firearm as Item #1 (test fires).
C4H7RK	Items 2 through 5 were fired in the same firearm; however, they were not fired in the same firearm as the item 1 test fires.
C8FKGV	Item 001-01 was eliminated to items 001-02 through 001-05, based on the disagreement of individual characteristics observed in the firing pin marks. Items 001-02 through 001-05 were identified as having been fired from the same unknown firearm, based on the agreement of class characteristics, and individual characteristics observed in the firing pin marks.
C8ZBFH	The questioned or doubted vanillas identified with numbers 2, 3, 4 and 5, were not struck in the suspicious pistol type firearm, brand Taurus Millennium PT140.
C9VYRB	Exhibits 1-2, 1-3, 1-4, and 1-5 were microscopically identified as having been fired in the same unknown firearm. The pistol that fired Exhibit 1-1 was eliminated as having fired Exhibits 1-2, 1-3, 1-4, and 1-5.
CA47YK	As a result of the comparasion of the received cartridge cases: ID EMP 2,3,4 and 5, items 2,3,4 and 5, motive of study, in relation to the ID samples (item 1), it is established that they do not present uniprocidence with any of the three (3) cartridge cases ID EMP1, item 1, that is to say, these were not percussion by the same firearm. The cartridge cases ID EMP 2,3,4 and 5, items 2,3,4 and 5 present uniprocidence among them, i.e.,all four (4) were fired by the same firearm. Taking into account that the cartridge cases submitted for analysis were part of .40 caliber cartridges, it can be established that they are commonly used as loading unit in pistol and/or submachine gun type firearms of automatic and/or semiautomatic operation and of the same caliber.
CD4AWY	The Item 2 through Item 5 fired cartridge cases were microscopically compared to each other based on the agreement of class characteristics. The four 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 5 fired cartridge cases were eliminated as having been fired by the same firearm that fired the Item 1 fired cartridge cases.
CK24N6	Item 1 contains three .40 Smith & Wesson caliber cartridge cases that were reportedly test fired from a Taurus Millennium PT 140 Pro pistol. Due to a discernible difference in firing pin aperture, the Item 2 through 5 cartridge cases were excluded as having been fired in the same firearm that fired the Item 1 cartridge cases. Item 2 through Item 5 are .40 Smith & Wesson

TABLE 2

WebCode	Conclusions
	caliber cartridge cases that bear the headstamp of PMC ammunition. The Item 2 through Item 5 cartridge cases were identified as having been fired in the same firearm.
CMT6PM	The test fired shell casings (Ex. 1) were compared to the evidence casings (Ex. 2,3,4,5). Based on some agreement of individual characteristics and agreement of discernible class characteristics, but insufficient for identification or elimination, results were inconclusive. (Inconclusive). The evidence shell casings (Ex. 2,3,4,5) were compared to each other. Based on the agreement of individual characteristics and all discernible class characteristics, it was determined that they were all fired in the same firearm. (Identification).
CN2FJ6	Item 1 consists of three .40 S&W caliber cartridge cases bearing the headstamp of PMC ammunition. The Item 1 cartridge cases were reported as being test fires from a Taurus pistol, Model Millennium PT140 Pro. Items 2 through 5 are .40 S&W caliber cartridge cases bearing the headstamp of PMC ammunition. The Item 2 through 5 cartridge cases were identified as having been fired in the same firearm. The Item 1 cartridge cases were eliminated from having been fired in the same firearm as the Item 2 through 5 cartridge cases, due to a difference in class characteristics.
CNG9A2	Item 002, Item 003, Item 004, and Item 005 were microscopically compared to each other and were identified as having been fired in the same unknown firearm due to the correspondence of all discernible class characteristics and sufficient agreement of individual characteristics. Item 002, Item 003, Item 004, and Item 005 were microscopically compared to Item 001 and could neither be identified nor eliminated as having been fired in the same firearm as Item 001 due to a lack of comparable individual characteristics. The correspondence of discernible class characteristics and some disagreement of individual characteristics were observed, but insufficient for an elimination. Item 001 through Item 005 are ineligible for entry into the National Integrated Ballistic Information Network (NIBIN).
CNMQJE	The Item 1 cartridge cases were Identified to each other. The Item 1 cartridge cases were Eliminated to the Item 2-5 cartridge cases. The Item 2-5 cartridge cases were Identified to each other.
CP27YZ	Three submitted cartridge cases (Items 1A, 1B, and 1C) were fired in the same firearm. Four submitted cartridge cases (Items 2, 3, 4, and 5) were fired in the same firearm. However, Items 2, 3, 4, and 5 were not fired in the same firearm as Items 1A, 1B, and 1C.
CPU9FN	The four individually packaged cartridge cases, identified as Items 2, 3, 4, and 5, were microscopically compared to one another and to the test fired cartridge cases in Item 1. The microscopic comparisons disclosed the following results: Items 2, 3, 4, and 5 were not fired by the firearm used to produce the test fired cartridge cases in Item 1 based on variations in class characteristics and a lack of correspondence in reproducing individual detail among the test fires (Item 1) and the questioned cartridge cases (Items 2, 3, 4, 5). Items 2, 3, 4, and 5 were further intercompared to one another revealing that all four cartridge cases were fired by the same unknown firearm based on an agreement of all discernible class characteristics and agreement of individual characteristics.
CPYE96	The fired cartridge cases marked Item 2, Item 3, Item 4 and Item 5 were fired in one firearm. The fired cartridge cases marked Item 2, Item 3, Item 4 and Item 5 were NOT fired in the same firearm which fired the cartridge cases Identified as Item 1.
CTZDN6	Items 2, 3, 4, and 5 were eliminated as having been fired from the same firearm as the Item 1 test fires. Items 2, 3, 4, and 5 were identified as having been fired from the same unknown firearm.
CYLEK9	The cartridge cases in Items 2, 3, 4 and 5 were not fired in the same gun that fired the

TABLE 2

WebCode	Conclusions
	cartridge cases in Item 1, based on differences observed in class characteristics.
CYLJTQ	The questioned expended .40 S&W caliber cartridge cases in items #2 through #5, were microscopically compared to the known expended .40 S&W caliber cartridge cases from the suspect's weapon in item #1 and were determined to not have been fired in the suspect's weapon. Questioned items #2 through #5 possessed similar class characteristics to the known expended .40 S&W caliber cartridge cases from the suspect's weapon in item #1; however, they possessed significantly differing individual markings and were determined to have been fired in a different weapon.
CYRMWG	Exhibits 2 through 5 were fired by the same unknown .40 S&W caliber firearm based on sufficient agreement of individual characteristics observed within the FPI marks indexed @ 6 o'clock with a mark. Exhibits 2 through 5 were not fired by Exhibit 1 based on difference of individual characteristics (FPI marks and FPAS marks).
D3YUCC	1: Exhibit 1 contains three 40 Smith & Wesson caliber PMC brand fired cartridge cases. Exhibits 2, 3, 4, and 5 each contain one 40 Smith & Wesson caliber PMC brand fired cartridge case. 2: Exhibits 1 through 5 were microscopically compared. A). The cartridge cases in Exhibit 1 were identified as being fired in the same firearm based on agreement of class characteristics and sufficient agreement of individual characteristics. B). The cartridge cases in Exhibits 2, 3, 4, and 5 were identified as being fired in the same firearm based on agreement of class characteristics and sufficient agreement of individual characteristics. C). The cartridge cases in Exhibit 1 were not fired in the same firearm as the cartridge cases in Exhibits 2, 3, 4, and 5 based on agreement of class characteristics and sufficient disagreement of individual characteristics. Observing this amount of disagreement from the same source is considered extremely remote.
D72P2G	The Item 2, Item 3, Item 4 and Item 5 were discharged from the different pistol than Item 1. The Item 2, Item 3, Item 4 and Item 5 were discharged from the same pistol.
DAMCR9	Casings M through P (Items 2 through 5) were identified as having been fired in the same firearm. The specific brand of the suspect weapon is unknown at this time. Casings M through P (Items 2 through 5) were not fired in the same firearm as the submitted test fired casings (Item 1), based on differences in individual characteristics.
DEDJGJ	Items 1 through 5: The Items 2 through 5 cartridge cases were Identified to each other. The Items 2 through 5 cartridge cases were Eliminated to the Item 1 cartridge cases.
DEQDWJ	The cartridge case received for study item 2 to 5 V1/4, V2/4, V3/4 and V4/4 were not struck in the Taurus brand Firearm 40 caliber S&W model Millenium PT 140.
DETXUK	After a microscopic evaluation, the fired cartridge case from the scene (Items 2, 3, 4, and 5) have been eliminated as having been fired from the suspect's Taurus Millennium PT140 Pro pistol based on sufficient disagreement of the individual characteristics in the the firing pin aperture shear marks. After a microscopic evaluation, Items 2, 3, 4, and 5 have been identified as having been fired in the same firearm based on sufficient agreement of the individual characteristics in the firing pin impression and firing pin aperture marks.
DRNXU4	Items 2, 3, 4, and 5 were eliminated as having been fired from the same firearm as Item 1 based on disagreement of class characteristics. Items 2, 3, 4, and 5 were identified as having been fired from the same unknown firearm.
DTCHCT	The four .40 S&W caliber fired cartridge cases (Items 2, 3, 4 and 5) are identified as having been fired in the same firearm. Identifications are made only to a degree of practical certainty and are based on sufficient agreement of the individual characteristics of tool marks. When

TABLE 2

WebCode	Conclusions
	sufficient agreement exists, in part, this means that the likelihood of another tool producing the same marks is so remote that it is considered a practical impossibility. The submitted fired cartridge cases (Items 2, 3, 4 and 5) are not identified or eliminated as having been fired in the submitted firearm (Item 1). The individual characteristics present do not display agreement (Inconclusive). However, the characteristics present suggest that they were fired in different firearms. Submission of those firearms is necessary for further examination.
DU9A7E	1: Examination of Exhibits 1, 2, 3, 4 and 5 revealed them all to be fired 40 S&W cartridge cases marketed by PMC. 2: Microscopic examination of the cartridge cases in Exhibits 1, 2, 3, 4 and 5 revealed the following. A). The cartridge cases in Exhibits 2, 3, 4 and 5 were fired in the same firearm due to an agreement of class characteristics and a sufficient agreement of individual characteristics. B). The three (3) cartridge cases in Exhibit 1 were not fired in the same firearm as Exhibits 2, 3, 4 and 5 based on an agreement of class characteristics and a sufficient disagreement of individual characteristics. Observing this amount of disagreement from the same source is considered extremely remote.
DVLJJK	Items 2 - 5 were identified as having been fired by the same firearm based on agreement of class and individual characteristics. Items 2 - 5 were eliminated as having been fired by the same firearm that fired Item 1 based on differences in class and individual characteristics.
DVZCTU	Microscopic examination and comparison of the PMC cartridge cases (Items 2, 3, 4, 5) revealed they can be eliminated as having been fired in the same firearm as the test-fired PMC cartridge cases (Items 1, 1A, 1B) based on differences in class characteristics. Microscopic examination and comparison of the PMC cartridge cases (Items 2, 3, 4, 5) revealed sufficient agreement of individual characteristics to conclude that they were fired in the same firearm.
DYXHLE	The Item 2, 3, 4 and 5 cartridge cases were Eliminated to the Item 1A - 1C cartridge cases. The Item 2, 3, 4, and 5 cartridge cases were Identified to each other.
E22TVM	On examination, I found the characteristic marks on Item 2, Item 3, Item 4 and Item 5 were not similar with the characteristic marks on Item 1.
EE9P73	Items 2 through 5 were fired in the same firearm but not the Taurus Millennium PT140 Pro handgun.
EHKQWE	The expended cartridges cases labeled (items 2, 3, 4 and 5) were discharged by firearms different to the firearm used to discharged the known expended cartridge cases labeled (item 1).
EHN9YJ	[No Conclusions Reported.]
EHTLNZ	Items 001-02 - 001-05 were fired in the same firearm (identification). This is also the opinion of Firearms Examiner. Items 001-02 - 001-05 were not fired in the same firearm as Item 001-01 (elimination). This is also the opinion of Firearms Examiner.
EJ4B7R	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, including breechface marks and firing pin aperture shear marks. I concluded that the four unknown cartridge cases were not fired in the same firearm as the test-fired cartridge cases.
EKVB6N	Based on class characteristic differences, items 2 through 5 (cartridge cases) can be eliminated as having been fired in item 1 (pistol). There are sufficient individual markings present to identify items 2 through 5 (cartridge cases) as having been fired in the same firearm.
EPUV2K	The four (4) discharged cartridge casings item 1-2 thru 1-5 were all fired by the same unknown weapon, not the weapon that fired the tests.

TABLE 2

WebCode	Conclusions
EU43CX	Because of differences in individual characteristics, the questioned cartridge cases (Items 2 to 5) could not have been fired in the same firearm as the known expended cartridge cases (Item 1).
F3EV8D	1: Examination of Exhibit 1 revealed it to be three fired 40S&W cartridge cases marketed by PMC. 2: Examination of Exhibits 2, 3, 4, and 5 revealed them each to be one fired 40S&W cartridge cases marketed by PMC. 3: Microscopic comparison of Exhibits 1, 2, 3, 4, and 5 revealed: a). Exhibits 2, 3, 4, and 5 were fired in the same firearm due to agreement of class characteristics and sufficient agreement of individual characteristics. b). Exhibit 1 was not fired in the same firearm as Exhibits 2, 3, 4, and 5 due to agreement of class characteristics and sufficient disagreement of individual characteristics. Observing this amount of disagreement from the same source is considered extremely remote. 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 disagreement from a different source is considered extremely remote.
F8ZCHX	1: Items (2, 3, 4) expended cartridge which recovered from the parking lot and Item 5 cartridge case which recovered from the grass area near the parking lot fire by same guns. 2: Item 1: Three expended cartridge cases discharged from the suspect's weapon (known) and Items (2, 3, 4, 5) not identical, so we conclude that (items 2, 3, 4, 5) fire by difference guns.
FCE8HL	Items 2 through 5 were eliminated as having been fired by the firearm that fired Item 1. This elimination is based on the disagreement of individual characteristics observed in the breechface impression marks. Items 2 through 5 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 impression marks.
FFMGVC	1 vs 2-5 Microscopic comparisons were conducted between the cartridge cases (Items 2-5) and the test fired cartridge cases (Item 1). There exists a disagreement of the discernible class characteristics and individual markings to eliminate the cartridge cases (Items 2-5) as having been fired in the firearm (Item 1). 2-5: Microscopic comparisons were conducted between the cartridge cases (Items 2-5). 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.
FFYDZG	Item 1: three (3) test fired cartridge cases. Item 2: one (1) fired cartridge case. Item 3: one (1) fired cartridge case. Item 4: one (1) fired cartridge case. Item 5: one (1) fired cartridge case. The submitted specimens marked as Item 1 was examined and identified as three (3) caliber .40 S&W test fired cartridge cases bearing the PMC headstamp. These specimens were obtained from the suspect firearm, a caliber .40 S&W Taurus semiautomatic firearm, model Millennium PT140 Pro. Item 1 was microscopically compared to Items 2 through 5. As a result of comparison it was concluded that Items 2 through 5 were not fired in the same firearm as Item 1, based on class characteristics. The submitted specimens marked as Items 2 through 5 were examined and identified as four (4) fired caliber .40 S&W cartridge cases bearing the PMC headstamp. Items 2 through 5 were microscopically compared to each other. As a result of microscopic comparison it was concluded that Items 2 through 5 were fired in the same

TABLE 2

WebCode	Conclusions
	firearm based on firing pin impression, breechface marks and shearing.
FH4PXH	Item 1 consists of three PMC brand .40 S&W caliber, fired cartridge cases from a known firearm. Item 2 consists of one PMC brand .40 S&W caliber, fired cartridge case. Item 3 consists of one PMC brand .40 S&W caliber, fired cartridge case. Item 4 consists of one PMC brand .40 S&W caliber, fired cartridge case. Item 5 consists of one PMC brand .40 S&W caliber, fired cartridge case. The questioned cartridge cases, Items 2 through 5, were examined, documented, and compared with the known cartridge cases, Item 1, with the following results: Exhibits 2 through 5 cartridge cases were eliminated as having been fired in the same firearm as the Exhibit 1 cartridge cases, because of a difference in individual characteristics. Exhibits 2 through 5 cartridge cases were identified as having been fired in the same firearm. A comparison microscope and digital imaging were used in the examination of the cartridge cases. REMARKS: Notes and data to support findings and opinions in this report are available upon request. Used in the course of the firearm examination were a comparison microscope and digital imaging as appropriate.
FPNY7F	Item 1: Three (3) .40 S&W caliber fired cartridge cases bearing the PMC headstamp (samples from Taurus Millennium PT140 Pro). (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) .40 S&W caliber fired cartridge cases bearing the PMC headstamp. Items 1 through 5 were microscopically intercompared. As a result of microscopic comparison, it was concluded that Items 2 through 5 were identified as having been fired in the same firearm. It was also concluded that Items 1-5 exhibit agreement of all discernible class characteristics, but Items 2 through 5 were eliminated as having been fired in the same firearm that fired Item 1 due to differences in individual characteristics.
FUVLQ4	The fired 40 S&W cartridge cases (Items 002, 003, 004, and 005) were compared microscopically to each other and to the test-fired cartridge cases (Item 001) described as from a Taurus Millennium PT140 Pro handgun. Items 002, 003, 004, and 005 were identified as having been fired by the same firearm. However, these items are eliminated from having been fired by the same firearm as Item 001. In the event a suspect firearm is recovered, the fired cartridge cases are suitable for further comparison.
FY9C3Q	Items 2, 3, 4 and 5 were not discharged from the same firearm as Item 1.
FYUAG7	The recovered cartridge cases from the scene were not fired from the suspect's weapon.
G6DD2Y	Lab Items #1 (three PMC 40 S&W test-fired cartridge cases from Taurus pistol) and #2-5 (four PMC 40 S&W fired cartridge cases) were examined and microscopically compared between 7/21/2021 and 7/22/2021. Based on agreement of all discernible class characteristics and sufficient agreement of individual characteristics, Lab Items #2-5 (four fired cartridge cases) were positively identified as having been fired in the same firearm. Based on disagreement of class or individual characteristics, Lab Items #2-5 (four fired cartridge cases) were eliminated as having been fired in Lab Item #1 (three test-fired cartridge cases from Taurus pistol).
GAUV62	The exhibit item listed as items 2, 3, 4 and 5 were eliminated as having been fired in the suspects firearm, however, all the exhibit fired cartridge cases were identified within the limits of practical certainty as having been fired in the same firearm.
GFAZV	I am of the opinion that the expended items 1 (known) are of an uncommon origin with items 2, 3, 4 and 5.
GGUXKV	The Items 01-02 through 01-05 cartridge cases were eliminated as having been fired in the same firearm as the Item 01-01 cartridge cases. The Items 01-02 through 01-05 cartridge

TABLE 2

WebCode	Conclusions
	cases were identified as having been fired from the same unknown firearm capable of chambering and firing a 40 S&W caliber cartridge.
GLKJ73	The Item 1A-1C cartridge cases were Identified to each other. The Item 1A-1C cartridge cases were Eliminated to the Item 2–5 cartridge cases. The Item 2-5 cartridge cases were Identified to each other.
GNAWZ	The exhibit fired cartridge cases recovered from the crime scene (Item 2 - 5) WERE NOT discharged in the submitted Taurus Millennium PT140 Pro handgun.
GTLV4K	The fired casings labeled as being fired by K1 were microscopically compared to Q2-Q5. It is my opinion that Q2-Q5 are eliminated as having been fired by K1 due to a lack of agreement in breachface, firing pin, ejector and firing pin drag marks seen.
GXAJW6	Items 2-5 were microscopically examined and identified as having been fired in the same unknown firearm based on agreement of the combination of individual characteristics and all discernible class characteristics. Items 2-5 were eliminated as having been fired in the Item 1 firearm due to disagreement of some discernible class characteristics and individual characteristics.
GXD3LU	Exhibits 2-5 were positive as having been fired from the same unknown firearm due to unique markings observed in the firing pin impression; however they were negative as having been fired from the Exhibit 1 firearm due to a lack of corresponding individual marks in all areas of the BFM, FPI, FPD, and ApSh.
GZ4BY4	Item 1: The Item 1 cartridge cases were Eliminated from the Item 2 through 5 cartridge cases. Items 2 through 5: These cartridge cases were Identified to each other.
GZE7AA	QC-1 through QC-4 were not fired in the same firearm as TC-1 through TC-3 due to differences in class characteristics. QC-1 through QC-4 were fired in the same unknown firearm based on sufficient agreement of individual characteristics.
H28EWJ	The Taurus pistol, specimen #1, was test fired using material from the laboratory collection and was found to be operable. The reference fired cartridge cases obtained were compared to the fired .40 S&W caliber cartridge cases, items #2 through #5. It was determined that items #2 through #5 possessed the same class characteristics as well as sufficient agreement of individual markings to determine that they were fired in the same weapon. Further examination revealed that items #2 through #5 possessed similar class characteristics but significant differing individual markings from the test fired material to determine that items #2 through #5 were not fired in item #1.
H37DKY	I conducted a comparative microscopic examination between the three .40S&W calibre fired cartridges cases (Item 1) and each of the single .40S&W calibre fired cartridge cases (Item 2, Item 3, Item 4 and Item 5). I examined the toolmarks left on the cartridge cases as a result of being chambered in, discharged, extracted and ejected from a firearm. I observed that the class characteristics of the toolmarks on the cases (Item 1) were somewhat similar to those left on the cases (Items 2, 3, 4 and 5). However a comparison of the individual characteristics (features and patterns within those toolmarks, particularly those imparted by the firing pin aperture and from the breech face) showed that whilst the same firearm was used to discharge all four cartridge cases (Items 2, 3, 4 and 5); a different firearm had been used to discharge the cases (Item 1).
H6FFA4	1. Casings M through P (Items 2 through 5) were identified as having been fired in the same firearm. Suspect weapons are unknown at this time; however, any suspect weapons should be submitted to the laboratory for analysis. 2. Casings M through P were not fired in the same

TABLE 2

WebCode	Conclusions
H7MRZR	<p>firearm that produced the submitted test fires (Taurus pistol, model PT140 Pro).</p> <p>The cartridge cases from the scene, items 2, 3, 4, and 5, were not fired in the suspect's gun. It is highly likely that items 2, 3, 4, and 5 were fired in the same gun. Items 2, 3, 4, and 5 are all fired cartridge cases from a crime scene. I compared the cartridge cases to each other using a comparison microscope. I observed the following class characteristics in common: .40 S&W caliber, hemispherical firing pin impressions, firing pin drag marks, extractor marks at 3:00 and ejector marks at 7:30 – 8:00. I observed sufficient agreement in consecutive matching striae (CMS) in the following areas to conclude it is highly likely that items 2 through 5 were fired in the same gun: primer shear marks, the firing pin drag mark; and on some, breech face marks and/or a mark on the rim of the cases at 10:00. See the next page for further discussion on this conclusion and subclass characteristics. Item 1 is three test fired cartridge cases from a suspect's pistol, a Taurus Millennium PT140Pro semi-automatic pistol. This pistol itself was not provided. Using a comparison microscope, I compared the test fires to each other and their marks were consistent with each other. I then compared the test fires to the evidence cases (items 2, 3, 4, and 5). While class characteristics mostly agreed (.40 S&W caliber, hemispherical firing pin impression, extractor marks at 3:00 and ejector marks at 7:30 – 8:00), I observed significant differences between the three test fired cartridge case and the evidence cartridge cases: While the ejector marks were similar in clockwise positioning, the test fires' ejector marks were closer to the primer, while the evidence cases all had ejector marks near the rim of the case heads. The firing pin impression on the evidence cartridge cases are larger than the test fires. While differences in ammunition can cause this difference, the evidence cartridge cases and test fires were the same brand ammunition with the same head stamp, which somewhat minimizes that concern (but does not eliminate it completely). CMS in the firing pin drag mark was different. CMS on the primer shear marks was different. The firing pin aperture impression on the test fires also had a 'smoother' edge than the evidence cartridge cases. I compared all marks on the rims of all three test fires to item 2's 10:00 rim mark, and did not find correspondence. If this is a magazine lip mark, then it could just mean a different magazine was used. I also compared all of the extractor marks. The test fires all have large, striated extractor marks in the extractor groove on the cases. The extractor marks on the evidence cases have light and/or narrow marks. I did not find any CMS correspondence between them. Breech face impression marks were mostly different. The test fires have breech face impressions around the firing pin aperture impression that suggest concentric machining marks on the suspect's firearm, which do not appear on items 2, 3, 4, and 5. I did observe a small area of CMS correspondence in breech face marks on the case head, but there were also a lot of differences in the CMS in the same area. The amount of corresponding CMS was not significant enough to outweigh all of the other differences I observed. Given all of the differences listed above and that the test fires seemed to mark consistently, it is my opinion that items 2, 3, 4, and 5 were not fired in the suspect's gun. As for items 2, 3, 4, and 5, without the gun that they were fired in to evaluate, I cannot determine if subclass was a factor. To make an identification, I need to evaluate the surfaces of the gun which made the marks of interest in order to determine whether the surfaces may have subclass features. Subclass features are surface features which are produced incidental to manufacture and can carry over to a limited population of consecutively manufactured guns or gun parts. Without a gun to examine, I cannot determine whether the marks made were individual, or could belong to a group of firearms with subclass features. If the breech face, firing pin, and edges of the firing pin aperture all have subclass features, it is possible that items 2, 3, 4, and 5 were fired in different guns with similar subclass features.</p>
HALCU4	<p>1). Casings M through P (Items 2 through 5) were identified as having been fired in the same .40 S&W firearm. The specific brand of the suspect weapon is unknown at this time. 2).</p>

TABLE 2

WebCode	Conclusions
	Casings M through P (Items 2 through 5) were not fired in the same firearm as the submitted test fired casings (Item1) based on differences in class characteristics.
HDKJ4F	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 Item 1, 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 2-5, were identified as having been fired in the same firearm. Through macroscopic/microscopic examination and based on significant disagreement of individual characteristics, the fired 40 S&W caliber cartridge cases, Laboratory Item 1, could not have been fired in the same firearm as the fired 40 S&W caliber cartridge cases, Laboratory Items 2-5.
HDNWX4	The Items 1.4 through 1.7 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 1.4 through 1.7 fired cartridge cases were not fired in the firearm (Taurus Millennium PT140 Pro) that produced the Items 1.1 through 1.3 test fired cartridge cases. These eliminations are based on differences in class characteristics.
HEX2BR	Items 2-5 were examined and microscopically compared to the cartridge cases submitted under Item 1. Items 2-5 were fired in the same firearm based on the sufficient agreement of individual characteristics. Item 4 will be compared to the open case file (IBIS/NIBIN). Items 2-5 were not fired in the same firearm as the cartridge cases submitted under Item 1 based on significant differences of individual characteristics. The above analysis began on 06/07/2021.
HGLFXG	Items 2, 3, 4 and 5 were fired in the same firearm. Items 2, 3, 4 and 5 fired cartridge cases were not fired in the suspect's weapon (Item 1).
HGN2VH	As recovered, the weapon is a .40 S&W caliber, Taurus, Model Millennium PT 140 Pro, Semi-Auto Pistol, S/N Unknown. The weapon was used to test fire Item's 1-1 (A,B,C), Three (3) .40S&W caliber live cartridges, no malfunctions. After physical and microscopic examination of the submitted evidence against the test firings from the suspects weapon (Item 1-1 A,B,C), I found the following: A). Item's 1-2, 1-3,1-4, and 1-5 Four (4) .40 S&W caliber discharged cartridge casings WERE ALL FIRED BY the same unknown weapon capable of chambering and discharging .40 S&W caliber live ammunition. B). These Item's 1-2, 1-3,1-4, and 1-5 Four (4) .40 S&W caliber discharged cartridge casings WERE NOT FIRED BY the Suspect Firearm submitted and used to test fire Item's 1-1 (A,B,C). No further examination will be conducted unless requested by the submitting agency.
HHEBKP	Item #2 through #5 (FCC4 through FCC7) were microscopically compared to each other and were identified as having been fired from the same firearm, not submitted. Item #2 through #5 were eliminated from Item #1 (Known, FCC1 through FCC3) due to differences in individual characteristics.
HL22T9	Items 2 through 5 were identified as having been fired by the same unknown firearm based on the agreement of class and individual characteristics. Items 2 through 5 were not fired by the same firearm that fired Item 1 (Tests) based on differences in class characteristics.
HPDZV3	The hypothesis that the four expended cartridge cases recovered (items 2, 3, 4 and 5) were fired with the same firearm but different of suspect's weapon (item 1) is very strongly supported.
HXE4AZ	The four questioned FCC's (Items 2-5) all displayed discernible class characteristics & sufficient agreement in a combination of individual characteristics showing that they were fired in the

TABLE 2

WebCode	Conclusions
	same firearm. Identification: The known FCC's (Item 1) and questioned FCC's (Items 2-5) showed some class characteristics, however, displayed significant disagreement in individual characteristics showing that the questioned FCC's (Items 2-5) were not fired in the exhibit known firearm (Item 1) - Elimination.
HY3QF9	In my opinion, items 2, 3, 4 and 5 were all fired in the same gun. This was not the gun that produced the test fired cartridges, item 1.
J3JJZZ	Cartridge Case Analysis: Methodology: Physical (Visual Examination), Microscopy (Comparison Microscopy). Items 2, 3, 4 and 5, the cartridge cases, were fired in the same firearm based upon corresponding class and individual microscopic characteristics. Items 2, 3, 4 and 5, the cartridge cases, were not fired in the same firearm as Item 1, the test fired cartridge cases, based upon different class and individual microscopic characteristics.
J9844F	See attached report. [No report was provided by participant]
J9LMXL	On examining the cartridges cases under the Comparison Microscope, it was found that the items (2,3,4 & 5) are fired from different firearm as compared with the item 1 (Known).
J9NEP2	Questioned expanded cartridges recovered from the parking lot (items 2, 3, 4) and from the grass area (item 5) were not discharged from the suspect weapon. These questioned expanded cartridges were discharged in a single firearm, different from the suspect's one.
JC8FZF	see attached report. [No report was provided by participant]
JKFUZW	The submitted test fired cartridge cases, Item 1, were fired in the same firearm. The submitted fired cartridge cases, Items 2, 3, 4, and 5, were fired in the same firearm. The submitted fired cartridge cases, Items 2, 3, 4, and 5, were not fired in the same firearm as the submitted test fired cartridge cases, Item 1. The submitted fired cartridge cases, Items 2, 3, 4, and 5, are consistent with being .40 S&W caliber cartridge cases that were fired in a short recoil operated firearm. A list of possible firearm manufacturers was unable to be determined.
JP88E7	The cartridge cases items 2, 3, 4, 5 were not fired from the same weapon as the three cartridge cases item 1. So they were not fired from the suspect's weapon. The cartridge cases items 2, 3, 4, 5 show the same individual marks. They were fired from one weapon.
JTTNDD	Items 2 through 5 were fired in the same firearm; however, they were not fired in the same firearm as the item 1 test fires.
JV6BYY	Items #2, 3, 4, 5 were all fired from the same firearm. These items were NOT fired from Item #1.
JXLY3H	The submitted cartridge cases were physically, visually, and microscopically examined and their characteristics documented. Microscopic examination and comparison of the four (4) fired 40 S&W caliber cartridge cases Items 2 through 5 reveals agreement of class and individual characteristics establishing that the four (4) fired 40 S&W caliber cartridge cases Items 2 through 5 were fired by the same unknown 40 caliber firearm (Identification). Microscopic examination and comparison of the test fired cartridge cases Item 1 to the four (4) fired 40 S&W caliber cartridge cases Items 2 through 5 reveals significant disagreement of individual characteristics establishing that the four (4) fired 40 S&W caliber cartridge cases Items 2 through 5 were not fired by the same firearm that fired Item 1 (Elimination).
JZPP8C	Item 1: Item 1 was Eliminated to Items 2 through 5. Items 2 through 5: Items 2 through 5 were Identified to each other.
K2G6WE	Item 2, Item 3, Item 4, and Item 5 were all compared microscopically and macroscopically to each other. Based on the agreement of individual and all discernible class characteristics, it

TABLE 2

WebCode	Conclusions
	<p>was determined that all four shell casings were fired from the same firearm (Identification). The four shell casings (Item 2,3,4,and 5) were compared to the test fired shell casings (Item 1). Although the shell casings have similar class characteristics; it was not possible to identify or eliminate these shell casings as having been fired from the Taurus pistol (Inconclusive).</p>
K2Z62P	<p>Item 1 consists of three (3) fired .40 S&W caliber cartridge cases, PMC brand, that were test fired in a known firearm. Items 2, 3, 4, and 5 are four (4) fired .40 S&W caliber cartridge cases, PMC brand, that were microscopically compared to each other and to the Item 1 cartridge cases. Items 2, 3, 4, and 5 were identified as having been fired in the same firearm as each other; however, they were eliminated as having been fired in the same firearm as the Item 1 cartridge cases.</p>
K3EFU3	<p>Visual and microscopic analyses of the evidence cartridge cases Item 2 through Item 5 and the test fired cartridge cases Item 1 from the Taurus Millennium PT140 Pro .40 S&W pistol K1 were initiated on June 8, 2021 and the results of the examinations, comparisons, and evaluations are as follows: Based on significant disagreement of individual characteristics, Item 2 through Item 5 were eliminated as having been fired with K1. Based on agreement of discernible class characteristics and sufficient agreement of individual characteristics, the evidence .40 S&W cartridge cases Item 2 through Item 5 were identified as having been fired with the same unknown firearm (Firearm 1). Should any other suspect firearm(s) be recovered, submit and reference the above CC#. Sufficient agreement is related to the significant duplication of random toolmarks as evidenced by a pattern or combination of patterns of surface contours. "Sufficient agreement" exists between two toolmarks means that the agreement is of a quantity and quality that the likelihood another tool could have made the mark is so remote as to be considered a practical impossibility.</p>
K7WLKB	<p>Microscopic comparisons were conducted between the Exhibit 1 through 5 cartridge cases, with the following results: Based on agreement of all discernible class characteristics and sufficient correspondence of individual characteristics, the Exhibit 1 cartridge cases were identified as having been fired in the same firearm. An identification conclusion indicates the probability that the Exhibit 1 cartridge cases were fired in a different firearm is so small that it is negligible. Based on agreement of all discernible class characteristics and sufficient correspondence of individual characteristics, the Exhibit 2 through 5 cartridge cases were identified as having been fired in the same firearm. An identification conclusion indicates the probability that the Exhibit 2 through 5 cartridge cases were fired in a different firearm is so small that it is negligible. Based on significant differences in class and individual characteristics, the Exhibit 2 through 5 cartridge cases were excluded as having been fired in the same firearm as the Exhibit 1 cartridge cases.</p>
K88HZM	<p>The questioned expended cartridge cases (Items 2-5) were discharged from the same firearm (unknown); The questioned expended cartridge cases (Items 2-5) were not discharged from the same firearm as the known expended cartridge cases (Item 1).</p>
KHRQKB	<p>The cartridges cases marked as item 2,3,4 and 5 provided with the mentioned test (21-5261) weren't discharged from the same weapon of the expended cartridges cases of the item 1.</p>
KKY3KK	<p>The cartridge cases Item 1 (known) were Eliminated from the cartridge cases Items 2 through 5. The cartridge cases Items 2 through 5 were Identified as having been fired in a single firearm.</p>
KUZMMD	<p>Pistol Taurus Millennium PT140 Pro Caliber 40S&W Serial number did not fired CC'S that inscribed item#2, item#3, item#4 and item#5.</p>
KYDC62	<p>The recovered questioned expended cartridge cases Items 2, 3, 4 and 5 have not been</p>

TABLE 2

WebCode	Conclusions
	discharged from the firearms as the known expended cartridge cases (Item 1). The recovered questioned expended cartridge cases Items 2, 3, 4 and 5 have been discharged from the same firearms.
L2GH2L	The examination of the recovered (questioned) expended cases under a comparison microscope, allows us to conclude that not a single one of them were fired from the seized Taurus Millennium PT140 Pro. The examination also showed that items 2,3,4 and 5, were fired from a second firearm.
L2XC4G	Items 1b, 1c, 1d and 1e (fired cartridge cases) are identified as having been fired in the same firearm. Identifications are made only to a degree of practical certainty and are based on sufficient agreement of the individual characteristics of tool marks. When sufficient agreement exists, in part, this means that the likelihood of another tool producing the same marks is so remote that it is considered a practical impossibility. Items 1b, 1c, 1d and 1e (fired cartridge cases) are not identified or eliminated (inconclusive) as having been fired in the same firearm as the agency submitted test shots (Items 1a1, 1a2 and 1a3). The individual characteristics present do not display agreement. Items 1b and 1a3 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.
L7ANFN	Based on the results of microscopic comparisons, we found that four cartridge cases Item 2, Item 3, Item 4 and Item 5 were fire from the same weapon caliber 40 S & W. But these four cartridge cases Item 2, Item 3, Item 4 and Item 5 were not fired from the suspects weapon that fired the submitted Item 1.
L7D4WV	The cartridge cases in Items 2 through 5 were not fired in the gun that fired the cartridge cases in Item 1, based on differences observed in class characteristics.
L84BDL	Items 2,3,4,5 (fccs 2,3,4,5) were eliminated from Item 1 due to differences in individual characteristics. Items 2,3,4,5 (fccs 2,3,4,5) were identified as having been fired in the same firearm.
LB6CGP	The cartridge cases were examined and microscopically compared with the following results: The four cartridge cases (Lab Items 2, 3, 4, and 5) were identified as having been fired in a single firearm due to sufficient agreement of class and individual characteristics and were eliminated as having been fired in same firearm that fired Lab Item 1 due to differences in class and individual characteristics.
LDW84X	The Item 1 test fired cartridge cases and Items 2–5 cartridge cases were microscopically examined. The Item 2–5 cartridge cases were identified as having been fired in the same firearm based on corresponding class and individual characteristics. The Item 2–5 cartridge cases were eliminated as having been fired in the Item 1 firearm due to differences in individual characteristics.
LGVLRM	Laboratory Item 1 Description: Three known test fires. Laboratory Item 2 Description: One questioned test fire. Laboratory Item 3 Description: One questioned test fire. Laboratory Item 4 Description: One questioned test fire. Laboratory Item 5 Description: One questioned test fire. The test fired cartridge cases marked #1 were examined and microscopically compared to the discharged cartridge cases marked #2, #3, #4, and #5 with negative (elimination) results. The cartridge cases marked #2, #3, #4 and #5 were not discharged in the firearm from #1. The discharged cartridge case marked #2 was examined and microscopically compared to the discharged cartridge cases marked #3, #4, and #5 with positive (identification) results. The

TABLE 2

WebCode	Conclusions
	cartridge cases marked #2, #3, #4, and #5 were discharged in the same unknown firearm.
LKQMKP	The reference fired cartridge cases, specimen #1, were microscopically compared to the .40 S&W caliber fired cartridge cases, specimens #2 through #5. It was determined that specimens #2 through #5 were fired in the same weapon; however, they were not fired in the Taurus pistol, specimen #1, due to differences in the markings from the breech faces and the firing pins.
LL4ZFD	The four (4) recovered .40S&W caliber discharged cartridge casings were fired by the same unknown weapon, not the weapon that fired the tests.
LT4D92	Visual and microscopic analyses of the .40 S&W evidence cartridge cases, Item 2 through Item 5 and the test fired cartridge cases from Item 1 firearm (Taurus Millennium PT140 Pro .40 S&W Pistol) were initiated on June 7, 2021. The results of the examinations, comparisons, and evaluations are as follows: Based on agreement of discernible class characteristics and sufficient agreement of individual characteristics, the evidence .40 S&W cartridge cases Item 2 through Item 5 were identified as having been fired with the same unknown firearm. Based on significant disagreement of individual characteristics, Item 2 through Item 5 were eliminated as having been fired with Taurus firearm Item 1.
LWMN4K	FCC-1 thru 4 (Item# 2 thru 5) was microscopically compared to each other and were identified as having been fired in the same firearm. FCC-1 thru 4 (Item# 2 thru 5) were eliminated as having been fired in Firearm P-1 (Item# 1) due to differences in individual characteristics.
LWP2YU	The fired cartridge cases in item 1 (a-c) were all fired in the same firearm. The fired cartridge cases in items 2, 3, 4, and 5 were all fired in the same firearm; however, they were excluded as having been fired in the same firearm as item 1 (a-c).
LZ6Q7J	All the cases were shot with the same weapon. They used weapon is different from the recovered pistol.
M2V73D	Items 1B through 1E were eliminated as having been fired by the same firearm as Item 1A. This elimination is based on the disagreement of individual characteristics observed in the firing pin aperture shear marks, firing pin impression marks and breechface impression marks.
M6XXG7	The expended cartridge cases contained in laboratory evidence items 1.1, 1.2, 1.3, 1.4 and 1.5 were microscopically compared to the test fires contained in laboratory evidence item 1.1 with the following results. Laboratory evidence items 1.2, 1.3, 1.4 and 1.5 were all excluded as having been fired from the same firearm said to have fired the cartridge cases submitted in laboratory evidence item 1.1. The expended cartridge cases contained in laboratory evidence items 1.2, 1.3, 1.4 and 1.5 were microscopically compared to each other with the following results. Laboratory evidence items 1.2, 1.3, 1.4 and 1.5 were all identified as having been fired from the same firearm, being a different firearm that fired the cartridge cases in laboratory evidence item 1.1.
M7Q3KD	Items 2 through 5 cartridge cases were fired by one firearm and were not fired by the same firearm that fired Item 1 cartridge cases, said to be fired by a Taurus Millennium PT140 Pro pistol. Items 2 through 5 are consistent with having been fired by a 40 S&W caliber firearm; however, available class characteristics are not specific enough to provide a list of possible firearm manufacturers/origins that may have fired these cartridge cases.
M9T678	Item 1: The cartridge cases were Eliminated to the Item 2 through Item 5 cartridge cases. Item 2 through Item 5: The cartridge cases were Identified to each other.
M9UVEB	The four (4) fired cartridge cases, items 2, 3, 4, and 5, were identified as having been fired

TABLE 2

WebCode	Conclusions
	from the same unknown firearm. The three (3) fired cartridge cases, item 1, were eliminated as having been fired from the same unknown firearm as the four (4) fired cartridge cases items 2, 3, 4, and 5.
ME3AAT	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 Taurus Millennium PT140 Pro handgun that was identified as being seized from the suspect. As a result of the comparison, I found that items 2, 3, 4 and 5 were not discharged in the .40 Smith and Wesson calibre Taurus Millennium PT140 Pro handgun.
ME6XQ8	1: Examination of Exhibit 1 disclosed three .40 S&W cartridge cases that are test standards from a Taurus Millennium PT140 Pro pistol. 2: Examination of Exhibits 2, 3, 4 and 5 disclosed four .40 S&W cartridge cases which were microscopically compared to the Exhibit 1 test standards. a). Microscopic comparison disclosed an agreement of class and sufficient disagreement of individual characteristics to conclude that Exhibits 2, 3, 4 and 5 were not fired in the same firearm as the Exhibit 1 test standards. Observing this amount of disagreement from the same source is considered extremely remote. b). Microscopic comparison disclosed sufficient agreement of class and individual characteristics to conclude that Exhibits 2, 3, 4 and 5 were fired in the same firearm.
MFFNVG	Items 1A1 through 1A3 (fired cartridge cases) are not identified or eliminated (inconclusive) as having been fired in the same firearm as Items 1B through 1E (fired cartridge cases). The individual characteristics present do not display sufficient agreement. However, the characteristics present suggest they were fired in different firearms. Submission of a suspect firearm is necessary for further examination.
MFV8EE	Items 1A, 1B and 1C (fired cartridge cases) are identified as having been fired in the same firearm. Items 2, 3, 4 and 5 (fired cartridge cases) are identified as having been fired in the same firearm. Items 1A, 1B and 1C (fired cartridge cases) are not identified or eliminated (inconclusive) as having been fired in the same firearm as Items 2, 3, 4 and 5 (fired cartridge cases). The individual characteristics present do not display agreement. However, the characteristics present suggest they were fired in different firearms. Submission of those firearms is necessary for further examination. Identifications are made only to a degree of practical certainty and are based on sufficient agreement of the individual characteristics of tool marks. When sufficient agreement exists, in part, this means that the likelihood of another tool producing the same marks is so remote that it is considered a practical impossibility.
MG8RGW	CARTRIDGE CASE(S): Items 1A, 1B, 1C, 2, 3, 4, 5. The Item 2, 3, 4, and 5 cartridge cases were Identified to each other. The Item 2, 3, 4, and 5 cartridge cases were Eliminated to the firearm that the Item 1A, 1B, and 1C cartridge cases were represented as having been fired in.
ML4DBK	Microscopic examination of Q1 through Q4 (item 002-005) disclosed sufficient agreement of individual and class characteristics. Therefore Q1 through Q4 were fired in the same firearm. Further examination of Q1 through Q4 (item 002-005) compared to test fired cartridge cases by K1 pistol (item 001) disclosed significant disagreement of discernible class and/or individual characteristics. Therefore Q1 through Q4 (item 002-005) were not fired in k1 pistol (item 001).
MLG6YV	Our forensic laboratory performed a full forensic examination regarding our SOPs of the delivered items (sent by CTS) and came to the following results: The forensic material consists of in total seven (7) cartridge cases (.40 S&W) with following description: Item 1: Three cartridge cases fired using a seized handgun (known). Items 2 – 5: Four (4) cartridge cases recovered at the crime scene (questioned). Result of the forensic examination: Items 2, 3, 4 and 5 were not discharged from the same firearm as the known cartridge cases (item 1). The

TABLE 2

WebCode	Conclusions
	discharged cartridge cases (item 3, 4, 5) have the same class characteristics and show matching striations and individual marks. Therefore, these three cartridge cases were discharged from the same, unknown firearm. The discharged cartridge case (item 2) have different class characteristics and show no matching striations and individual marks. Therefore, this cartridge case was discharged from another unknown firearm.
MN7AZF	The four .40 S&W caliber fired cartridge cases (Items #2 through #5) are identified as having been fired in the same firearm. The four .40 S&W caliber fired cartridge cases (Items #2 through #5) are not identified or eliminated (inconclusive) as having been fired in the same firearm as the three .40 S&W caliber fired cartridge cases (Items #1-T1, #1-T2, and #1-T3). The individual characteristics do not display agreement. Identifications are made only to a degree of practical certainty and are based on sufficient agreement of the individual characteristics of tool marks. Sufficient agreement, in part, means that the likelihood of another tool producing the same marks is so remote that it is considered a practical impossibility.
MR7DUM	Item 1.1 consists of three fired PMC brand 40 S&W cartridge cases stated to have been fired by a Taurus Millennium PT140 Pro pistol. 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 the fired cartridge cases from Item 1.1 and to each other. Based on agreement of all discernible class characteristics and corresponding individual detail in the firing pin marks, Items 1.2, 1.3, 1.4 and 1.5 were identified as having been fired by the same firearm. Based on class characteristic differences in the firing pin marks and firing pin aperture sheer marks, Items 1.2, 1.3, 1.4 and 1.5 can be eliminated as having been fired by the same firearm that fired the fired 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 at to be considered a practical impossibility.
MVT9EV	The results support that the cartridge cases Item 2, Item 3, Item 4 and Item 5 have not been fired in the firearm Item 1. The results strongly support that the cartridge cases Item 2, Item 3, Item 4 and Item 5 have been fired in the same firearm.
MW7PQM	Items 2, 3, 4, and 5 were all fired in the same firearm. Items 2, 3, 4, and 5 were not fired in the same firearm as Item 1 due to differences in individual characteristics.
MYU4CC	Items 2 through 5 were fired in the same firearm; however, they were not fired in the same firearm as the item 1 test fires.
MZ2HJH	Item 1 The cartridge cases were Identified as having been fired in a single firearm. Items 2 through 5 The cartridge cases were Identified as having been fired in a single, second firearm. The cartridge cases were Eliminated with respect to having been fired in the same firearm as the cartridge cases Item 1.
N36NKA	Based on class characteristics, Items 2, 3, 4 and 5 were eliminated as having been fired in the same firearm that fired Item 1. Based on an agreement of class and individual characteristics, Items 2, 3, 4 and 5 were identified as having been fired in the same firearm.
N74UAM	Items 1.1, 1.2, 1.3, 1.4, & 1.5: The expended casings were originally components of 7 PMC brand 40 S&W caliber cartridges. Microscopic examination and comparison revealed the following: Items 1.2, 1.3, 1.4 and 1.5 are eliminated as having been fired in the same firearm that fired the known tests Item 1.1, based on the observed disagreement of class and individual characteristics. Items 1.2, 1.3, 1.4 and 1.5 have all been fired from the same unknown

TABLE 2

WebCode	Conclusions
	weapon based on the observed agreement of their class characteristics and sufficient agreement of their individual characteristics.
NAPMD4	Based on an agreement of class and individual characteristics, Items 2, 3, 4 and 5 were identified as having been fired in the same firearm. Items 2, 3, 4 and 5 were eliminated as having been fired in the same firearm as Item 1 (test shots) based on differences in class characteristics.
NMEL47	1: Examination of Exhibit 1 revealed three fired .40 S&W cartridge cases marketed by PMC and labeled as known test fired standards from the suspect's firearm. 2: Examination of Exhibits 2, 3, 4, and 5 revealed each contains one fired .40 S&W cartridge case marketed by PMC. 3: Microscopic comparison revealed Exhibits 2, 3, 4, and 5 were fired from the same firearm due to an agreement of class characteristics and sufficient agreement of individual characteristics. 4: Microscopic comparison revealed Exhibits 2, 3, 4, and 5 were not fired from the same firearm as Exhibit 1 due to an agreement of class characteristics but sufficient disagreement of individual characteristics. Observing this amount of disagreement from the same source is considered extremely remote. 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.
NMT27L	The suspect's firearm was eliminated as having fired the cartridge cases from the crime scene (items 2-5). The cartridge cases (items 2-5) were identified as having been fired from the same unknown firearm.
NMUPUQ	Items 2-5 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 2-5 were microscopically eliminated as having been fired in the same firearm that reportedly fired the Item 1 test fires, due to disagreement of individual characteristics.
NR6Y49	Macroscopic and microscopic examination of Exhibits 1 through 5 determined the following: Exhibit 1(A through C) consists of three (3) .40 S&W caliber cartridge cases bearing the PMC headstamp, reportedly fired in a Taurus brand, model Millennium PT140 Pro handgun. Exhibits 2 through 5 consist of four (4) fired, .40 S&W caliber cartridge cases bearing the PMC headstamp, which contain marks of value for comparison. Exhibits 2 through 5 were microscopically compared to the Exhibit 1(A through C) reported test fires, with the following results: Due to differences in class and individual characteristics, Exhibits 2 through 5 were excluded as having been fired in the same firearm that fired Exhibits 1(A through C). It was determined there is agreement of all discernible class characteristics and sufficient agreement of individual characteristics to identify Exhibits 2 through 5 as having been fired in the same firearm. An identification conclusion indicates that the probability Exhibits 2 through 5 were fired in a different firearm is so small that it is negligible.
NRNTEH	Sufficient disagreement of both class and individual characteristics to determine that Items 2, 3, 4 & 5 were not discharged in the firearm (Item 1).
NRYXNZ	The test fires from the submitted Taurus pistol Item #1, were microscopically examined and

TABLE 2

WebCode	Conclusions
	found to be reproducible. The test fires from the pistol were microscopically compared to the questioned cartridge cases Items #2-5. All four questioned cartridge cases could be excluded as being fired in the Item #1 firearm based on differences in firing pin impressions and breechface marks. The questioned cartridge cases were microscopically compared to one another and class characteristics were similar and sufficient agreement in individual characteristics were observed between the firing pin impressions, breechface marks, and firing pin shear to conclude that Items #2-5 were all fired from the same unknown firearm.
NTVBDD	[No Conclusions Reported.]
NUXML4	Items 2, 3, 4, and 5 were all microscopically identified as having been fired in the same unknown firearm, a different firearm than Item 1.
NWC8QP	I am of the opinion that both the class and individual characteristics of breach face and firing pin impressions on the exhibits items 2, 3, 4 and 5 are not of a common origin with the class and individual characteristics of breach face and firing pin impressions on exhibit items 1 suggesting a possible uncommon origin.
NWX9LL	The four 40 S&W cartridge cases (items 2 through 5) were fired in the same firearm; however, they were not fired in the same firearm as test-fired cartridge cases from suspect's firearm (Item 1).
P7GX6Q	Items 2-5 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 2-5 were microscopically eliminated as having been fired in the same firearm as the Item 1 test fires due to disagreement of discernible individual characteristics. Item 1 test fires and Item 2 were imaged into the Integrated Ballistics Identification System (IBIS) / BrassTRAX database. Any identification made from this entry will be supplemented. All items of evidence are being returned.
P894C6	Item 2, 3, 4 and 5 were discharged from the second (unknown) firearm.
P8CKEA	1: The cartridges cases marked E-1 to E-3, describes in item 1, are .40 S&W caliber, and were fired by the same firearm (Identification). 2: The cartridge case marked E-4, describes in item 2, the cartridge case marked E-5, describes in item 3, the cartridge case marked E-6, describes in item 4, the cartridge case marked E-7, describes in item 5, are .40 S&W caliber and were fired by the same firearm (Identification). 3: The cartridge case marked E-4, describes in item 2, the cartridge case marked E-5, describes in item 3, the cartridge case marked E-6, describes in item 4, the cartridge case marked E-7, describes in item 5, are .40 S&W caliber and were not fired by the firearm used fired the cartridge cases marked E-1 to E-3, described in tem 1.
PERA9B	I microscopically compared Items 1 (A, B, C) to Items 2, 3, 4, and 5. Items 2, 3, 4, and 5 can be eliminated as being fired in the same firearm as Items 1A, 1B, and 1C, based on significant disagreement of individual characteristics within the firing pin impression and breech face marks. I identified Items 2, 3, 4, and 5 as being fired in a second firearm based on sufficient agreement of individual characteristics within the firing pin impression, ejector, breech face, and firing pin aperture shear marks.
PHPTBA	Microscopic examination and comparison of the three test fired cartridge cases (item # 1) with the four submitted cartridge cases (items # 2,3,4 and 5) reveals sufficient microscopic evidence to conclude that the four submitted cartridge cases (Items # 2,3,4 and 5) were not fired in or from the pistol that fired the three test fired cartridge cases (item # 1).
PPPAN2	The Item 1 cartridge cases were Identified to each other. The Item 1 cartridge cases were

TABLE 2

WebCode	Conclusions
	Eliminated to Items 2, 3, 4, and 5. The Item 2, 3, 4, and 5 cartridge cases were identified to each other.
PZWRJD	After microscopic comparison, it was determined that Items# 2, 3, 4, 5 were not fired from the same firearm as Item #1, based on differences of class and individual characteristics. After microscopic comparison, it was determined that Items# 2, 3, 4, 5 were fired from the same firearm based on sufficient agreement of class and individual characteristics of the breech face marks and the aperture shear marks.
Q3VFKK	The three expended cartridge cases were compared among each other to evaluate the intravariability of the visible marks. The four seized cartridge cases were compared among each other to understand if they were fired from the same firearm. With this examination we could determine marks with fine individual details which support very strongly the hypothesis, that those four cartridge cases were fired with one firearm. After we compared the the three expended cartridge cases with the four seized cartridge cases, taking into account the results of the first two steps of examination (intravariability of the test shots and the examination of the seized cartridge cases coming) cartridge cases from the seized firearm were compared to the seized cartridge casings. The results of this last comparison step showed a very high support for the hypothesis, that the four seized cartridge cases were not fired by the same firearm as those three cartridge cases fired with the firearm from the suspect.
QBQHKB	I compared the questioned cartridge cases, Item 2, 3, 4 and 5 to the known cartridge cases, Item 1, using a comparison microscope. There was some agreement of class characteristics but sufficient disagreement of individual characteristics to determine that the questioned cartridge cases, Items 2, 3, 4 and 5 had not been discharged in the same firearm as the cartridge cases, Item 1. There was sufficient agreement of class and individual characteristics to determine that the cartridge cases, Items 2, 3, 4 and 5 had been discharged in one firearm.
QDCBL7	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 2–5 EXCLUSION: The Items 2–5 discharged cartridge cases were excluded as having been fired in the Item 1 Taurus based on differences in class characteristics.
QLMNDA	Items 2, 3, 4, and 5 cartridge cases were fired from one firearm. These cartridge cases are most consistent with being fired by a 40 S&W caliber firearm; however, class characteristics present are not specific enough to provide a list of possible firearm manufacturers/origins. Items 2, 3, 4 and 5 were not fired by the same firearm that fired the Item 1 cartridge cases.
QNWGNB	The submitted cartridge cases were physically, visually, and microscopically examined and their characteristics noted. The four submitted .40 caliber cartridge cases (item numbers, 2, 3, 4 and 5) were microscopically compared to one another and to the test cartridge case from the recovered firearm (item number 1). Item numbers 2, 3, 4 and 5 display similar class firing characteristics and corresponding areas of individual characteristics. Item numbers 2, 3, 4 and 5 were identified as having been discharged in the same firearm (IDENTIFICATION). The four submitted cartridge cases (item numbers 2, 3, 4 and 5) displayed significantly different areas of individual characteristics when compared to the test cartridge case submitted under item number number 1. The four recovered cartridge cases (item numbers 2, 3, 4 and 5) were eliminated as having been discharged in the gun that produced the test cartridge cases (item number 1) (ELIMINATION).
QPMVY8	The class characteristics in the items 2, 3, 4 and 5 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

TABLE 2

WebCode	Conclusions
	cases item 1.
QT6YPP	Items 1 through 5 are .40 S&W cartridge cases bearing the headstamp of PMC ammunition. The Item 2 through Item 5 cartridge cases were identified as having been fired in the same firearm. Due to a difference in class characteristics (firing pin impression [smooth vs irregular] and aperture), Item 2 through Item 5 were not fired in the same firearm as the Item 1 cartridge cases.
QTT3HY	Visual and microscopic analyses of the evidence cartridge cases (item 2 through item 5) and test fired cartridge cases from item 1 were performed starting July 7, 2021 and the results of the comparisons and evaluations are as follows: Based on agreement of discernible class characteristics and sufficient agreement of individual characteristics, item 2 through item 5 (Q1 through Q4) are identified as being fired with the same unknown firearm. Based on significant disagreement of individual characteristics, item 2 through item 5 (Q1 through Q4) are eliminated as having been fired with the item 1 (Taurus Millennium PT140 Pro) pistol.
QVXTNE	[No Conclusions Reported.]
QX2JT9	1: The cartridge cases marked from E-1 to E-3, described in Item 001, are .40 S&W caliber, and were fired by the same firearm (identification). 2: The cartridge cases marked from E-4 to E-7, described in Item 001, are .40 S&W caliber, and were fired by the same firearm (identification); they were not fired by the firearm used to fire the cartridge cases marked E-1 to E-3.
QX7WJQ	Items 2-5 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 2-5 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.
QXZTK6	Items 2-5 were Eliminated to Item 1. Items 2-5 were Identified to each other.
R3RHG3	The questioned .40 S&W caliber cardrige cases, identified with Items 2, 3, 4 and 5, were not fired in the suspect Taurus Millennium PT140 Pro pistol-type firearm.
R4NV6G	In relation to the microscopic study between the discharged unknown cartridge cases (item 2, item 3, item 4 and item 5) and the known cartridge case (item 1): FIRST CONCLUSION: Based on the results of the study, we concluded that the discharged unknow cartridge cases (item 2, item 3, item 4 and item 5) have been discharged by the same pistol. (SCALE CONCLUSION: IDENTIFICATION). A IN OUR SCALE. SECOND CONCLUSION: The pistol that discharged item 2, item 3 item 4 and item 5 is a diferent weapon that the suspect weapon (Taurus Millenium PT140). (SCALE CONCLUSION: EXCLUSION). E IN OUR SCALE.
R88UQQ	The Item 2, 3, 4 and 5 cartridge cases were identified, within the limits of practical certainty, as having been fired from the same firearm. The Item 2, 3, 4 and 5 cartridge cases were not fired from the same firearm that fired the Item 1 test fired cartridge cases.
RAE4UG	Comparisons performed between the test fired cartridge cases (Item 1) and the cartridge cases (Items 2-5) resulted in an exclusion. The spent cartridge cases (Item 2-5) were NOT fired in the same firearm as the test fired cartridge cases (Item 1).
RBKQ4E	The cartridge cases (Items 2-5) were not discharged from the same firearm as the known cartridge case (Item 1).
REMD86	This report refers to exhibits by Lab Number. The following results only apply to the items tested. The three test fired cartridge cases in Exhibit 1 were microscopically compared to each other and to the fired cartridge cases in Exhibits 2-5. Based on a disagreement of class

TABLE 2

WebCode	Conclusions
	characteristics, Exhibits 2-5 were excluded as having been fired in the same firearm as the cartridge cases in Exhibit 1. Exhibits 2-5 were microscopically compared to each other. Based on an agreement of class characteristics and sufficient agreement of individual characteristics, Exhibits 2-5 were identified as having been fired in the same firearm.
RNU2YG	Fcc-1 thru Fcc-4 (items 2 thru 5) were microscopically compared to each other and were identified as having been fired in the same firearm. Fcc-1 thru Fcc-4 (items 2 thru 5) were eliminated as having been fired in firearm, Pistol P-1 (item 1) due to known differences in individual characteristics.
RYR7K3	The four cartridge cases found at the scene were not fired from the Taurus Millenium PT 140 pistol.
T6X6U8	Items(#2, #3, #4, #5) were microscopically examined to each other. Based on these comparative examinations and observed class and individual characteristics, it was determined that; Item #2, #3, #4 and #5 were not discharged from the same firearm as the known expended cartridge cases (Item #1).
T6ZXJT	Comparison microscope examinations were conducted and it is the finding of this examiner that casings M through P were identified as having fired in the same .40 S&W firearm; however, they were not fired in the .40 S&W Taurus pistol, model Millennium PT140 Pro based on differences in individual characteristics. Suspect weapons are unknown at this time; however, any suspect weapon should be submitted to the laboratory for analysis.
TA99NF	Items 2 thru 5 were microscopically compared to each other and were identified as having been fired in the same firearm Items 2 thru 5 were eliminated as having been fired in firearm, item 1 due to difference in individual characteristics.
TAR632	1: Examination of Exhibit 1 revealed three .40 S&W cartridge cases labeled as test standards from the recovered .40 S&W Taurus Millennium PT140 Pro pistol. 2: Examination of Exhibits 2 through 5 revealed four .40 S&W cartridge cases. 3: Microscopic comparison revealed that Exhibits 2 through 5 were fired from the same firearm based on sufficient agreement of class and individual characteristics; however, Exhibits 2 through 5 were not fired from the same firearm as Exhibit 1 based on agreement of class characteristics and sufficient disagreement of individual characteristics. Observing this amount of disagreement from the same source is considered extremely remote.
TBJY2Q	Cartridge Case Analysis: Methodology: Physical (Visual Examination), Microscopy (Comparison Microscope). Items 2, 3, 4, and 5, the cartridge cases, were fired in the same firearm based upon corresponding class and individual microscopic characteristics. Items 2, 3, 4, and 5, the cartridge cases, were not fired in Item 1, the Taurus pistol, based upon different class and individual microscopic characteristics.
TFFUFJ	The four (4) fired cartridge cases, items 1.2, 1.3, 1.4, and 1.5, were consistent in all observable class characteristics (caliber and firing pin impression) as the Taurus pistol, item 1.1. While there is some disagreement of microscopic markings, the markings present are insufficient for an elimination. The results are inconclusive. The four (4) fired cartridge cases, items 1.2, 1.3, 1.4, and 1.5, were each identified as having been fired in the same firearm. Note: Identifications are based on the agreement of all discernable class characteristics and agreement of corresponding individual microscopic markings.
TGRA7E	Items #2-5 have been compared microscopically with each other. Based on the agreement of of all discernible class characteristics and a sufficient agreement of corresponding individual characteristics they have been identified as having been fired in the same firearm. Items #2-5 were compared microscopically with tests fired in Item #1. Based on the agreement of of all

TABLE 2

WebCode	Conclusions
	discernible class characteristics and a sufficient disagreement of corresponding individual characteristics Items #2-5 have been eliminated from being fired in Item #1.
THZQXH	The reference fired cartridge cases, specimen #1, were microscopically compared to the .40 S&W caliber fired cartridge cases, specimens #2 through #5. It was determined that specimens #2 through #5 were fired in the same weapon; however, they were not fired in the Taurus pistol, specimen #1, due to differences in the markings from the breech faces and firing pins and the aperture striations.
TJGQ9Y	SUBMISSION 002, 003, 004, and 005: These cartridge cases were identified to each other and eliminated from the submission 001 "test fired cartridge cases from a Taurus Millennium PT140 pistol".
TKN3Y9	After examination I found: The characteristic marks on "Item 2", "Item 3", "Item 4" and "Item 5" were dissimilar with "Item 1". Hence, I am of opinion that the ammunition components were fired by different firearms.
TKRHGF	Examinations showed Items 2, 3, 4 and 5 were not discharged within the same firearm as Item 1. Examinations showed Items 2, 3, 4 and 5 were discharged within the same unknown firearm.
TT4N67	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 Item 1, 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 2-5, were identified as having been fired in the same firearm. Through macroscopic/microscopic examination and based on significant disagreement of individual characteristics, the fired 40 S&W caliber cartridge cases, Laboratory Item 1, could not have been fired in the same firearm as the fired 40 S&W caliber cartridge cases, Laboratory Items 2-5.
TUC3HR	Items 1, 2, 3, 4 and 5: Items 2, 3, 4 and 5 were identified to each other. Items 2, 3, 4 and 5 were eliminated from Item 1 based on a difference in class characteristics.
TXEUNJ	The Item 1 "known" test fired cartridge cases were microscopically examined and compared to Items 2-5. They share similar class characteristics. However, based on the observed disagreement of individual characteristics, Items 2-5 were eliminated as having been fired in the same firearm that fired the Item 1 "known" cartridge cases.
TYKE9D	The fired cartridge cases, Items 2, 3, 4 and 5 were fired from the same unknown firearm. They were not fired from the Item 1 pistol.
TYRDVW	Per the case agent, the cartridge cases in Item 1 were test-fired in a Taurus Millennium PT140 Pro 40 S&W caliber firearm. Only the test-fired cartridge cases, not the firearm, were submitted for examination. Items 2, 3, and 4 were microscopically compared to Item 5. It was determined that the cartridge cases have the same class of firearm-produced marks and sufficient corresponding individual marks to conclude that Items 2 through 5 were fired in the same unknown firearm. Item 5 was microscopically compared to a test-fired cartridge case from the Taurus firearm, Item 1. It was determined that the cartridge cases have the same class of firearm-produced marks, but significant disagreement in individual marks. These cartridge cases were fired in different firearms. Furthermore, based on this comparison, it can be concluded that Items 2, 3, and 4 were also fired in a different firearm than the Taurus firearm, Item 1.

TABLE 2

WebCode	Conclusions
U3NFZM	The four (4) fired cartridge cases, Items 2, 3, 4, and 5, were identified as having been fired in the same firearm; however, not in the firearm that generated the test fire cartridge cases, Item 1.
UEWB9R	Items: Description/Visual Examination Item 1: Three (3) reported test fired cartridge cases. 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: Items 2 thru 5, (4) fired cartridge cases, fired in the same firearm. Elimination: Based upon the difference in class characteristics, the following eliminations were made: Items 2 thru 5, (4) fired cartridge cases, not fired in the same firearm as Item 1.
UEWFH9	In my opinion items 2, 3, 4 and 5 were NOT fired in the recovered gun (item 1). In my opinion items 2, 3, 4, and 5 were all fired in the same but different gun to item 1.
ULVXY7	After a microscopic evaluation Items 2, 3, 4, and 5, were eliminated as having been fired in the suspect's firearm, the Taurus Millennium PT140 Pro 40 S&W caliber handgun based on a sufficient disagreement of individual characteristics in the firing pin impression and firing pin aperture shear marks. Items 2, 3, 4, and 5 were identified as having been fired in the same firearm based on a sufficient agreement of individual characteristics in the firing pin impression and firing pin aperture shear marks.
UR42AE	Item's 2 thru 5 were eliminated as having been fired in Item #1 due to difference in individual characteristics, Item #2 and Item #5 were fired in the same firearm, not submitted. Item #3 and Item #4 were fired in the same firearm, not submitted.
UTCDKN	None of the questioned expended cartridge cases (Items 2-5) were fired with the same firearm as the known expended cartridge cases (Item 1).
UWX7QP	Cartridge Case Analysis: Methodology: Physical (Visual Examination), Microscopy (Comparison Microscopy). Items 2, 3, 4 and 5, the cartridge cases, were not fired in the same firearm as Item 1, the test fired cartridge cases, based upon different class and individual microscopic characteristics. Items 2, 3, 4 and 5, 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.
UXBKCD	Examinations showed Items 2 through 5 were not discharged within the same firearm as Item 1. Examinations showed Items 2 through 5 were discharged within the same unknown firearm.
UY4MT2	RESULTS: Item 1 through Item 5. Item 2 through Item 5 were Identified to each other. Item 2 through Item 5 were Eliminated to Item 1.
V2MUXF	Microscopic examination and comparison of the submitted test expended casings (item#1) with the four (4) submitted questioned expended casings (items #2-5) revealed sufficient disagreement of individual characteristics to conclude that items #2-5 had not been fired in item #1, the Taurus pistol. Further microscopic examination and comparison of items #2-#5 revealed sufficient agreement of individual characteristics to conclude that they had all been fired in the same unknown weapon.
V6LDW8	Items 2 thru Items 5 were compared microscopically and Identified as being discharged from the same Firearm. Test standards from the submitted Firearm were compared microscopically to Item 2 thru Item 5 with negative results, thus were eliminated from having been discharged in the submitted Firearm.
V98ZNV	Items 1A, 1B, 1C, 2, 3, 4 & 5. Items 2, 3, 4 and 5 were Eliminated to Items 1A, 1B and 1C. Items 2, 3, 4 and 5 were Identified to each other.

TABLE 2

WebCode	Conclusions
VBY3MW	Items 1A, 1B and 1C were identified as having been fired by the same firearm based on the agreement of class and individual characteristics. Items 2, 3, 4 and 5 were identified as having been fired by the same firearm based on the agreement of class and individual characteristics. Items 2, 3, 4 and 5 could not have been fired by the firearm that fired Items 1A, 1B and 1C based on differences in class characteristics.
VCTMFM	Cartridge Case Analysis: Methodology: Physical (Visual Examination), Microscopy (Comparison Microscopy). Items 1A, 1B, and 1C, the cartridge cases, were fired in the same firearm based upon corresponding class and individual microscopic characteristics. Items 2, 3, 4, and 5, the cartridge cases, were fired in the same firearm based upon corresponding class and individual microscopic characteristics. Items 2, 3, 4, and 5, the cartridge cases, were not fired in the same firearm as Items 1A, 1B, and 1C, the cartridge cases, based upon different class and individual microscopic characteristics.
VDZ6CX	1: Exhibits 1.2 through 1.5 were fired from the same unknown .40 S&W caliber firearm based on sufficient agreement of individual characteristics. 2: Exhibits 1.2 through 1.5 were not fired from the firearm that discharged Exhibit 1.1 based on differences in class characteristics.
VEB2PP	On examination, I found the characteristic marks on the known expended cartridge cases (Item 1) to be dissimilar to the characteristic marks on the questioned expended cartridge cases (Items 2-5). Therefore, I am of the opinion that the questioned expended cartridge cases (Items 2-5) were not discharged from the same firearm as the known expended cartridge cases (Item 1).
VFTYBM	The marks on the three reference cartridge cases left by the suspected firearm (Taurus Millenium PT140 Pro) have been observed and compared. Similitudes have been observed mainly on the shear marks around the firing pin mark, the extractor mark and the ejector mark. The bottom of the firing pin mark was relatively smooth and without particular characteristics. The questioned cartridge cases (Item 2,3,4,5) have been 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 and the references. Several differences have been highlighted in the firing pin marks, the ejector marks and the extractor marks comparison. These observations support extremely strongly the hypothesis of a difference source between the observed marks on the questioned and the reference samples.
VJAB7H	The 40 S&W cartridge cases (Items 01-02 - 01-05) were identified as having been fired in the same unknown firearm. The 40 S&W cartridge cases (Items 01-02 - 01-05) were eliminated as having been fired in the Taurus pistol that fired the cartridge cases (Item 01-01) due to differences in individual characteristics.
W2ZHFF	The Taurus pistol was test fired using material from the laboratory collection. The test fired cartridge cases, item 1, were compared to the fired cartridge cases, items 2 through 5. Items 2 through 5 were fired in the same weapon; however they were not fired by the Taurus pistol (item 1).
W4Q8V8	The cartridge cases Items 2, 3, 4, and 5 were ELIMINATED with respect to having been in the same firearm as the cartridge cases Item 1, which were said to have been fired in the suspect's firearm. However, the cartridge cases Items 2, 3, 4, and 5 were IDENTIFIED as having been fired in a single firearm.
W7CZM2	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 Item 1, were identified as having been fired in the same firearm. Through

TABLE 2

WebCode	Conclusions
	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 2-5, were identified as having been fired in the same firearm. Through macroscopic/microscopic examination and based on significant disagreement of individual characteristics, the fired 40 S&W caliber cartridge cases, Laboratory Item 1, could not have been fired in the same firearm as the fired 40 S&W caliber cartridge cases, Laboratory Items 2-5.
W9L2T9	Items 2A through 5A are identified as having been fired in the same firearm. NOTE: Identifications are made only to a degree of practical certainty and are based on sufficient agreement of the individual characteristics of tool marks. When sufficient agreement exists, in part, this means that the likelihood of another tool producing the same marks is so remote that it is considered a practical impossibility. Items 2A through 5A are not identified or eliminated (inconclusive result) as having been fired in the submitted firearm (.40 S&W caliber Taurus). The individual characteristics present do not display agreement. However, the characteristics present suggest Items 2A through 5A were fired in a different firearm. Submission of that firearm is necessary for further examination. Items 2A 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] [City, State] only unless requested otherwise and will remain in the database unless a request to remove the entry is received.
WABCJ2	Through microscopic examination and comparison, it was determined that CCBI Items 2-5 were fired in the same firearm. Through microscopic examination and comparison, it was determined that CCBI Items 2-5 were not fired in the same firearm as CCBI Item 1.
WEDW3T	Items 2 through 5 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 compared item 2 to the test fires from the Taurus Millennium PT140 Pro pistol and found similar class marks but significant differences in individual marks. In the absence of alteration, items 2 through 5 were not fired in the item 1 Taurus pistol.
WH4K7D	FCC-1 through FCC-4 (Item 2 through Item 5) were discharged in the same unknown firearm, however, they were not discharged in Pistol P-1 (Item 1) due to differences in individual characteristics.
WRT942	The three (3) cartridge cases, item 1, possessed similar and reproducible firing pin impressions and breech face markings; thus, they were identified as having been discharged in the same known firearm. The cartridge cases, item 2, 3, 4 and 5 were identified as having been discharged in the same firearm; however, because of the differences in the firing pin impression and breech face markings these cartridge cases were not discharged in the same known firearm that discharged the three (3) cartridge cases, item 1.
WTT4VK	Items 2 - 5 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 - 5 were microscopically eliminated as having been fired in the same firearm that reportedly fired Item 1, due to disagreement of individual characteristics.
WUKA3X	Microscopic examination and comparison of the four (4) fired 40 S&W caliber cartridge cases Items 2, 3, 4 and 5 reveals agreement of class and individual characteristics establishing that Items 2, 3, 4 and 5 were fired by the same unknown firearm (Identification). Microscopic examination and comparison of the test fired cartridge cases Item 1 to the four (4) fired 40 S&W caliber cartridge cases Items 2, 3, 4 and 5 reveals significant disagreement of individual characteristics establishing that Items 2, 3, 4 and 5 were not fired by the same firearm that

TABLE 2

WebCode	Conclusions
	fired Item 1 (Elimination).
WXJL34	Items 2, 3, 4 and 5 were identified as having been fired in the same firearm. Items 2, 3, 4, and 5 were eliminated from having been fired in item 1 due to a difference in individual characteristics.
WZD8Z2	Items 2 through 5 were fired in the same firearm; however, they were not fired in the same firearm as the item 1 test fires.
X7BFHD	The test fired cartridge cases from Item 1 and the recovered fired cartridge cases, Items 2–5, share similar class characteristics with each other. They all exhibit individual characteristics that may be of value for a comparative analysis. The test fired cartridge cases from Item 1, were microscopically examined and compared with the recovered fired cartridge cases, Items 2-5. Based on the observed disagreement of individual characteristics, Items 2, 3, 4 and 5 are eliminated as having been fired in the same firearm as the test fired cartridge cases from Item 1.
X87YNL	Items 2, 3, 4 and 5 were microscopically examined and, based on corresponding class and individual characteristics, identified as having been fired in the same firearm. Item 1 was microscopically examined. Due to differences in individual characteristics, Items 2 through 5 were eliminated as having been fired in the firearm represented by the Item 1 cartridge cases.
XFVRPK	Fired cartridge case Item 2, Item 3, Item 4 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 drag marks, firing pin impression marks and breechface marks. Fired cartridge case Item 2, Item 3, Item 4 and Item 5 were eliminated from having been fired in the same firearm as fired cartridge cases within Item 1 based on disagreement of class characteristics.
XGVGMN	Submissions 001-2 through 001-5 fired cartridge cases were microscopically compared. Based on agreement in class characteristics and sufficient agreement in individual characteristics submissions 001-2 through 001-5 fired cartridge cases were identified as having been fired in the same firearm. Submission 001-2 fired cartridge case was microscopically compared to submission 001-1B test fired cartridge case. Based on dissimilarities in individual characteristics submissions 001-2 through 001-5 fired cartridge cases were eliminated as having been fired in the same firearm as submissions 001-1A, 001-1B, and 001-1C test fired cartridge cases (Taurus Millennium PT140 Pro handgun).
XKQNA6	Items #2, 3, 4 & 5 are all identified as being fired by one gun based on an agreement of class & individual characteristics. Items #2, 3, 4, & 5 are excluded from being fired by the same gun as item #1 based on a difference in class & individual characteristics.
XP9PNP	Laboratory Items 001.B (Item 2), 001.C (Item 3), 001.D (Item 4), and 001.E (Item 5) four spent 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), 001.D (Item 4), and 001.E (Item 5) four spent PMC 40 S&W cartridge cases are eliminated as being fired by the same firearm as Laboratory Item 001.A (Item 1) three spent PMC 40 S&W cartridge cases from the subject's Taurus Millennium PT140 PRO handgun.
XRBDJE	The Items 01-02 to 01-05 cartridge cases were eliminated as having been fired in the same firearm as the Items 01-01 cartridge cases. The Items 01-02 to 01-05 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.
XVUMEX	The three test fired cartridge cases from Exhibit 1, were microscopically compared to each

TABLE 2

WebCode	Conclusions
	other and to the fired cartridge cases in Exhibits 2-5. Based on an agreement of class characteristics and sufficient agreement of individual characteristics, Exhibits 2-5 were fired in the same firearm. Based on a disagreement of class characteristics, Exhibits 2-5 were excluded as having been fired in the same firearm that fired the three Exhibit 1 test fires.
Y6UNZG	Items 1 through 5 are .40 S&W caliber cartridge cases that bear the headstamp of PMC ammunition. The Item 2 through 5 cartridge cases were identified as having been fired in the same firearm, and were excluded as having been fired in the Item 1 firearm.
Y6YUUX	The Exhibit 2 –5 cartridge cases were microscopically examined and compared together. Based on an agreement of class characteristics and sufficient agreement of individual characteristics, the cartridge cases, Exhibits 2-5, were determined to have been fired in the same firearm. The probability that the toolmarks on Exhibits 2–5 were made by different sources, other than the same firearm, is so small that it is negligible. The Exhibit 2–5 cartridge cases were microscopically examined and compared to the Exhibit 1 “test fires”. While class characteristics were in agreement, there was a significant disagreement of individual characteristics. It was determined the cartridge cases, Exhibits 2-5, were not fired in the same firearm as the cartridge cases, Exhibit 1.
Y8Z6GK	The Item 1 PMC 40 S&W cartridge cases were microscopically examined and identified as having been fired in the same firearm based on corresponding class and individual characteristics. The Item 2, 3, 4, and 5 PMC 40 S&W cartridge cases were microscopically examined and identified as having been fired in the same firearm based on corresponding class and individual characteristics. The Item 1 cartridge cases were eliminated as having been fired in the same firearm as the Item 2, 3, 4, and 5 cartridge cases due to differences in class characteristics.
YA926A	From the microcomparison made of the questioned cartridge cases identified as items 1, 2, 3 and 4, correspondence was found in their class and individual characteristics, that is, were fired by the same firearm. The .40 "S&W caliber handgun, Taurus brand, Millenium PT140 PRO model, from which the known ballistic elements identified as items 1.1, 1.2 and 1.3 were obtained, it did not fired the questioned cartridge cases identified as Items 2, 3, 4 and 5 (single group).
YFDZfZ	1: The cartridge cases marked E-1 to E-3 described in the item 1, are 9mm Luger caliber and were fire by the same firearm (Identification). 2: The cartridge cases marked E-4 to E-7, described in the item 1, are 9mm Luger caliber and were fired by the same firearm (Identification). 3: The cartridge cases marked E-1 to E-3, described in the item 1, are 9mm Luger caliber and were not fired by the firearm used to fire the cartridge cases marked E-4 to E-7, described in the item 1.
YFWV9M	Comparison microscope examinations were conducted the findings of this examiner are as follows: 1). Casings M through P (Items 2 through 5) were identified as having been fired in one .40 S&W firearm. The specific brand of the suspect weapon is unknown at this time. 2). Casings M through P (Items 2 through 5) were not fired in the same firearm that produced the submitted test fires (Item 1), based on differences in class characteristics.
YL67DB	FIRE CARTRIDGE CASES ITEMS #2 THRU 5 WERE IDENTIFIED AS BEING FIRED IN THE SAME FIREARM. FIRED CARTRIDGE CASES ITEMS #2 THRU 5 WERE ELIMINATED FROM FIREARM TEST SHOT FIRED CARTRIDGE CASES ITEM #1, DUE TO DIFFERENCES IN INDIVIDUAL CHARACTERISTICS.
YMUKPR	1: Exhibit 1 consists of three (3) fired cartridge cases and Exhibits 2, 3, 4, and 5 each consist of one (1) fired cartridge case; all the Exhibits mentioned before are .40 S&W caliber PMC brand.

TABLE 2

WebCode	Conclusions
	2: Exhibits 2 through 5 were fired in the same firearm based on an agreement of class characteristics and sufficient agreement of individual characteristics. 3: Exhibit 1 was not fired in the same firearm as Exhibits 2 through 5 based on an agreement of class characteristics and sufficient disagreement of individual characteristics. Observing this amount of disagreement from the same source is considered extremely remote.
YT4MRM	Items: Description/Visual Examination Item 1: Three (3) test fired 40 caliber cartridge cases. 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 # 2 thru 5 Evidence Type: (4) fired cartridge cases. Conclusion: Fired in the same firearm Elimination Based upon the difference in individual characteristics, the following eliminations were made: Lab Item # 2 thru 5 Evidence Type: (4) fired cartridge cases. Conclusion: Not fired in the same firearm as Item 1.
YY3GFM	Item numbers 1-2, 1-3, 1-4, and 1-5 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. Item number 1-1 was microscopically compared to item numbers 1-2, 1-3, 1-4, and 1-5 and found to have different class characteristics. Item number 1-1 was eliminated as having been fired in the same firearm as item numbers 1-2, 1-3, 1-4, and 1-5.
Z7362L	Items 001-2 through 001-5 are four fired PMC brand 40 S&W caliber cartridge cases. I microscopically compared Items 001-2 through 001-5 to each other. I observed agreement of all discernable class characteristics with sufficient agreement to conclude that these four cartridge cases were fired in a single firearm. I microscopically compared Item 001-2 to one of the test-fired cartridge cases, Item 001-1-A. I observed differences in their class characteristics and significant differences in their individual characteristics to conclude that Item 001-2 was not fired in the same firearm that produced the test-fired cartridge cases, Item 001-1; therefore Items 001-2 through 001-5 were not fired in the same firearm that produced the test-fired cartridge cases, Item 001-1.
ZFD7ML	Items 001-02 through 001-05 are four PMC brand 40 S&W caliber fired cartridge cases. I microscopically compared these cartridge cases to each other. I observed agreement of all discernable class characteristics and sufficient agreement of individual characteristics to conclude that these four cartridge cases were fired in a single firearm. I then microscopically compared one of these cartridge cases (Item 001-02) to a test fired cartridge case from the Taurus pistol. I observed agreement of discernable class characteristics but disagreement of individual characteristics between these items. Therefore, Items 001-02 through 001-05 were not fired in the Taurus pistol.
ZFRRWN	The cartridge cases, items 2 through 5, were compared to each other using a comparison microscope. Based on these comparisons, it is my opinion that there was agreement of discernable class characteristics and sufficient agreement of individual characteristics to conclude that all four cartridge cases were fired in the same firearm. A test-fired cartridge case from item 1 was compared to the cartridge cases reportedly recovered from the crime scene, items 2 through 5, using a comparison microscope. Significant disagreement of individual characteristics was observed to conclude the four cartridges cases, items 2 through 5, were not fired in the firearm that produced the test-fired cartridge cases.
ZG68LH	The exhibit firearm (Item 1) did not discharge any of the exhibit fired cartridges cases (Items 2 to 5) - ELIMINATION. The exhibit fired cartridge cases (Items 2 to 5) were all discharged in the same unknown firearm - IDENTIFICATION.
ZJR4RN	The test-fired cartridge cases in item 1 were compared to the discharged cartridge cases, items 2 through 5, using a comparison microscope. In my opinion, these cartridge cases were

TABLE 2

WebCode	Conclusions
	eliminated from being fired in that same firearm due to significant disagreement of discernible class and individual characteristics. The discharged cartridge cases, items 2 through 5, were compared to each other using a comparison microscope. In my opinion, all four discharged cartridge cases were fired in the same firearm, due to agreement of discernible class characteristics and significant agreement of individual characteristics.
ZLWRN	Visual and microscopic analyses of the evidence cartridge cases Q1 through Q4 (Items 2-5) and test fires from K1 TF1-TF3 (Item 1) were initiated on June 9, 2021 and the results of the comparisons and evaluations are as follows: Based on agreement of discernible class characteristics and sufficient agreement of individual characteristics Q1 through Q4 can be identified as having been fired with the same unknown firearm. Q1 through Q4 can be eliminated as having been fired with K1 due to differences in individual characteristics.
ZR7WYD	The four 40S&W cartridge cases (items 01-02 – 01-05) were eliminated from having been fired in the Taurus pistol represented by the test fired cartridge cases (item 01-01). This elimination is due to significant differences in class and individual characteristics. The four 40S&W cartridge cases (items 01-02 - 01-05) were identified as having been fired in a single unknown firearm.

Additional Comments

TABLE 3

WebCode	Additional Comments
22447W	Sufficient agreement or significant disagreement not observed between Items 2, 3, 4, 5 and Item 1 (test fired cartridge cases). Overall few marks on test fired cartridge cases (Item 1). Very few marks in firing pin impression on test fires (Item 1). Many reproducing granular marks are present in the firing pin impressions of Items 2, 3, 4, and 5. Agreement observed in the firing pin drag marks of Items 2, 3, 4, and 5. Agreement observed in the firing pin drag marks of the test fires (Item 1). No agreement observed between the firing pin drag marks of Items 2, 3, 4, 5 and the test fires (Item 1). Only three TF's provided for comparison. Only one brand of ammo and one primer type used for TF'ed samples. The firearm is not available for additional test fires with different ammo and in single action and double action. Per laboratory policy, Individual characteristic eliminations involve exceptional circumstances and are encountered rarely and if the firearm is available for additional tests.
2JLZPW	Identification: Is based on in the agreement of the individual characteristics observed through the microscopic comparison examination.
37WJHB	The numbers used for each Item were created from our LIMS and pertain to how the Items were packaged: Item 1 = 01-01, 01-02, 01-03, Item 2 = 01-04 Item 3 = 01-05 etc.
38TRTF	In subjectively interpreting firearm evidence, I have considered the probability of the comparison findings given a recovered cartridge case had been fired in the suspect's firearm. Conversely, I have also considered the probability of the comparison findings given the cartridge case had been fired in another firearm.
3MHBUV	On the comparisons between test fires (Item 1) and the Items 2, 3, 4, and 5; Disagreement was noted in the FP marks. The test fires have very few granular marks in the FP (almost smooth) observed in #1A, #1B and #1C vs #2, #3, #4, #5 all of which have complex granular features in the FP that are reproducing. Additional disagreement noted in the BF and BF shear marks. No indications the firearm that fired #1 also fired Items #2, #3, #4, and #5 however insufficient disagreement of individual characteristics for elimination. Without having the submitted firearm to exam, this lab does not routinely eliminate solely on differences in individual characteristics.
46YPXB	Items 001-01 through 001-05 are Items 1-5 respectively.
4YCV2D	The exhibit fired cartridge cases (Item 2-5) were all discharged in the same firearm.
642NMD	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 reviewed and compared. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. A microscopic comparison examination consists of a search of the impressed and striated marks present in two toolmarks to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) 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:

TABLE 3

WebCode	Additional Comments
	<p>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 (No Conclusion): 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 variation in substrate, changes in tool working surfaces from wear, corrosion, and damage, or the employment of unusual tool/work piece orientations, 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.</p>
6ABXYF	<p>The cartridge cases in Items 2 through 5 were fired in the same gun, based on agreement observed in individual characteristics.</p>
73BQ4D	<p>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.</p>
78FJ4B	<p>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 reviewed and compared. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. A microscopic comparison examination consists of a search of the impressed and striated marks present in two toolmarks to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) 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:</p>

TABLE 3

WebCode	Additional Comments
	<p>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 (No Conclusion): 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 variation in substrate, changes in tool working surfaces from wear, corrosion, and damage, or the employment of unusual tool/work piece orientations, 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.</p>
7EGXMQ	<p>The four incriminating .40 S&W caliber cartridge cases described in this report in items (2,3,4 and 5) are not uniprocident to the .40 S&W caliber cartridge cases described in item 1 as standard or reference sample taken from the suspicious firearms, Taurus Millennium PT 140 Pro.</p>
7K4RVA	<p>Possible manufacturing marks observed on items 1 (2 of the 3 test fires), 2, and 3. These marks did not index to any of the firing event markings or the headstamp characters. Possibly originated during manufacturing or cartridge assembly.</p>
7MCVH7	<p>All four questioned cartridge cases appear to have been fired with the same handgun.</p>
7N7NAJ	<p>The method of testing for ammunition components (that have results that fall into the range of conclusions defined below) included microscopic comparison: 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. The submitted items will be transferred to the Evidence Section for return to your agency.</p>

TABLE 3

WebCode	Additional Comments
8KK8JB	An examination showed the exhibit fired cartridge cases contained in Items 2 to 5 had all been fired in an unknown pistol.
8M6K7E	The firearm seized from the suspect did not participate in the scene.
8RH438	Lab Items 001-02 - 001-05 were fired in the same firearm (identification). This is also the opinion of Firearms Examiner.
92G48Y	Class and individual characteristics were in agreement between the firing pin impressions of the cartridge cases, Items 2, 3, 4 and 5. There are significant differences of individual characteristics between the firing pin impressions of the test fires, Item 1, and the cartridge cases, Items 2, 3, 4 and 5.
99HRVD	1: We follow three points report scheme which describes as follows: Fired Means Similar and Identified, Not Fired Means Dissimilar and Eliminated, No definite opinion Means Result is inconclusive. 2: We have used microscope technique for the Comparison of known (T1, T2 and T3) with questioned (C2, C3, C4 and C5) using microscope projectina Vision X. 3: Class, Sub-Class and individual characteristics were compared done for the opinion given.
A6XT4G	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.
ATHZF8	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 reviewed and compared. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. A microscopic comparison examination consists of a search of the impressed and striated marks present in two toolmarks to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) 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

TABLE 3

WebCode	Additional Comments
	<p>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 (No Conclusion): 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 variation in substrate, changes in tool working surfaces from wear, corrosion, and damage, or the employment of unusual tool/work piece orientations, 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.</p>
ATMHE7	Items 2 through 5 were identified as having been fired in the same firearm.
BD8NT8	The fired cartridge cases (Items 2 to 5) however had been discharged within the same firearm (Identification).
BXVZCY	For this test, I assumed the suspect's pistol had unique working surfaces. Examining the firearm for unique working surfaces is a standard part of my examinations.
CA47YK	That they do not present uniprocidence with none of the three (3) cartridge cases ID EMP1, item 1, that is, these were not hit by the same firearm. The cartridge cases ID EMP 2,3,4 and 5 items 2,3,4 and 5 have a single origin, that is, all four (4) were hit with the same firearm. Taking into account that the cartridge cases used for analysis were a constituent part of .40 caliber cartridges, it can be established they commonly serve as a loading unit in pistol-type firearms and/or submachine guns with automatic and/or semi-automatic operation and of the same caliber.
CK24N6	<p>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 reviewed and compared. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. A microscopic comparison examination consists of a search of the impressed and striated marks present in two toolmarks to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) 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:</p>

TABLE 3

WebCode	Additional Comments
	<p>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 (No Conclusion): 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 variation in substrate, changes in tool working surfaces from wear, corrosion, and damage, or the employment of unusual tool/work piece orientations, 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.</p>
CMT6PM	<p>Inconclusive results were based on some agreement of individual characteristics and agreement of discernible class characteristics, but insufficient for identification or elimination.</p>
CN2FJ6	<p>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 reviewed and compared. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. A microscopic comparison examination consists of a search of the impressed and striated marks present in two toolmarks to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) 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</p>

TABLE 3

WebCode	Additional Comments
	<p>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 (No Conclusion): 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 variation in substrate, changes in tool working surfaces from wear, corrosion, and damage, or the employment of unusual tool/work piece orientations, 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.</p>
CNG9A2	<p>Item 001 exhibits inconsistency in position/shape of the ejector mark for comparison to the position/shape of the ejector mark of Item 002 through Item 005. Item 001 also exhibits limited breechface marks in the same areas on the primer/headstamp for comparison to breechface marks of Item 002 through Item 005. Item 001 lacks sufficient individual characteristics within the firing pin impression for comparison to the firing pin impressions of Item 002 through Item 005. Differences in individual characteristics within the firing pin aperture shear marks between Item 001 and Item 004 were observed; however, Item 004 is the only fired cartridge case to exhibit firing pin aperture shear marks on the left side of the firing pin impression of a quantity/quality sufficient for comparison to firing pin aperture shear marks of Item 001.</p>
CNMQJE	<p>I identified the exemplars (Item 1) to each other since I did not test fire the gun myself.</p>
CYLEK9	<p>The cartridge cases in Items 2, 3, 4 and 5 were compared to each other. The cartridge cases in Items 2, 3, 4 and 5 were fired in the same gun.</p>
CYLJTQ	<p>Further examination of the questioned expended .40 S&W caliber cartridge cases in items #2 through #5 revealed they possessed the same class characteristics, as well as, sufficient reproducing individual markings to one another and were determined to have been fired in the same weapon; but were not fired in the suspect's weapon.</p>
D3YUCC	<p>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.</p>
D72P2G	<p>The test was entered very late due to problems with customs.</p>
DEQDWJ	<p>The cartridge case received for study item 2 to 5 were struck in a 40 caliber S&W Firearm</p>

TABLE 3

WebCode	Additional Comments
	different from the Taurus brand Firearm model Millenium PT 140 confiscated from the suspect of the shooting in the nightclub.
DETXUK	The identifications of the cartridge cases to each other in this case are 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.
DTCHCT	Lab procedure does not permit eliminations based on individual characteristics. Because of this, the results are inconclusive.
GLKJ73	I performed a microscopic comparison on the Item 1 cartridge cases since I did not perform the test firing myself.
GNAWZ	All four of the exhibit fired cartridge cases recovered from the crime scene (Items 2 - 5) had been discharged in the same unknown firearm.
HXE4AZ	The firearm that discharged the questioned FCC's (Items 2-5) is still outstanding!
K2G6WE	I found it to be inconclusive because there were some similarities on the primer area, but not enough to eliminate or identify that it was fired in that firearm.
KUZMMD	CCS that inscribed item#2, item#3, item#4 and item#5 were discharged from the same firearm but different from the suspect pistol.
L7D4WV	The cartridge cases in Items 2 through 5 were fired in the same gun, based on agreement observed in individual characteristics.
LT4D92	Should another suspected firearm be recovered, submit, and refer to the aboce CC#. "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.
M2V73D	Items 1B through 1E 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 firing pin aperture shear marks, firing pin impression marks, breechface impression mark and ejector marks.
M7Q3KD	A comment about NIBIN suitability and entry would have been made for the evidence cartridge cases and the test-fires.
M9T678	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

TABLE 3

WebCode	Additional Comments
	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. The submitted items will be transferred to the Evidence Section for return to your agency.
ME3AAT	The fired cartridge cases listed as items 2, 3, 4 and 5 were all discharged in the same firearm. This firearm was not the Taurus Millennium PT140 Pro handgun that was identified as being seized from the suspect.
ME6XQ8	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.
MFFNVG	Procedures do not allow us to eliminate on individual characteristics. The ejector mark observed on the test shots was in a slightly different location than the ejector mark observed on the evidence. However, the actual firearm would need to be examined due to the subtle difference.
MFV8EE	Per policy, eliminations are only allowed when there are differences in class characteristics.
MG8RGW	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. The submitted item(s) will be transferred to the Evidence Section for return to your agency.
MN7AZF	Per Laboratory's policy, an elimination cannot be based solely on differences in individual characteristics or lack thereof. Eliminations can only be based on differences in class characteristics and/or machining marks.
NMT27L	I have assumed that the possibility of subclass influence was eliminated by the makers of this proficiency.

TABLE 3

WebCode	Additional Comments
NRNTEH	Sufficient agreement of both class and individual characteristics to conclusively determine that Items 2, 3, 4 & 5 were discharged in the same firearm (not recovered).
NTVBDD	Questioned expended cartridge cases (Items 2, 3, 4, 5) were discharged from the same firearm.
NWX9LL	The four 40 S&W cartridge cases (items 2 through 5) were compared microscopically to each other and to the test-fired cartridge cases from suspect's firearm (Item 1). Identifications were made between the four 40 S&W cartridge cases (items 2 through 5) based on agreement of class characteristics and sufficient corresponding individual detail observed in breechface marks and firing pin impressions. Eliminations were made between items 2 through 5 and the test-fired cartridge cases from suspect's firearm (Item 1) based on differences in class characteristics and individual detail observed in extractor marks, ejector marks, breechface marks, firing pin impressions, and firing pin aperture shear marks.
P8CKEA	Identification: Based on the agreement of the individual characteristic observed through the microscopic comparison examination.
PHPTBA	Microscopic examination and comparison of the two submitted cartridge cases (items # 2 and 3) reveals sufficient microscopic evidence to conclude that these two fired cartridge were fired in the same pistol, but not in Item # 1). Microscopic examination and comparison of the two submitted cartridge cases (items # 4 and 5) reveals sufficient microscopic evidence to conclude that these two fired cartridge cases were fired in the same pistol, but not in the pistol (Item # 1 tests) and not the same pistol that fired Items # 2 and 3.
QLMNDA	A test-fire from the firearm and one representative from Items 2, 3, 4, and 5 would also be entered into the NIBIN database and a statement to this effect would be included in the report wording as appropriate.
QPMVY8	Similarities have been observed between the marks in the Items 2, 3, 4 and 5. This observation lead to an additional examination between the marks in Items 2, 3, 4 and 5. The findings of this examination were viewed under the following two hypotheses: H1: The questioned items are fired by one firearm. H2: The questioned items are fired by two or more firearms of the same caliber and with the same class characteristics. The likelihood ratio (LR) of the findings is expressed in the following verbal 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). The findings of the additional examination are at least very much more probable if Hypothesis 1 is true than if Hypothesis 2 is true.
QT6YPP	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 reviewed and compared. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. A microscopic comparison examination consists of a search of the impressed and striated marks present in two toolmarks to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) 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

TABLE 3

WebCode	Additional Comments
	<p>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 (No Conclusion): 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. 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 variation in substrate, changes in tool working surfaces from wear, corrosion, and damage, or the employment of unusual tool/work piece orientations, 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.</p>
QX2JT9	<p>Identification: Based on the agreement of individual characteristics observed by microscopic comparison examination. Explanatory Notes: - All cartridge cases were submitted to the laboratory in one item (001). CTS submitted items and lab marks: Item 1 = E-1 to E-3, Item 2 = E-4, Item 3 = E-5, Item 4 = E-6, Item 5 = E-7.</p>
R88UQQ	<p>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. Information received by the [Lab] indicates that the Item 1 test fired cartridge cases from [Lab] File No.: [File #] were fired from a .40 S&W calibre, Taurus, Model Millennium PT 140 Pro, semi-automatic pistol.</p>
R9R7K3	<p>The four cartridge cases found at the scene were fired from the same handgun.</p>
TAR632	<p>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.</p>

TABLE 3

WebCode	Additional Comments
	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.
TFFUFJ	Eliminations cannot be made based on individual characteristics as per laboratory policy.
TUC3HR	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.
ULVXY7	The identification of the cartridge cases with one another 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.
UR42AE	Retracted due to item # change from 4 to 5.
UTCDKN	The questioned expended cartridge cases (items 2-5) were fired with another unknown same firearm.
UWX7QP	NIBIN: A test fired cartridge case from Item 1, will be entered into NIBIN. The results of NIBIN entries and searches will be the subject of a separate report.
UY4MT2	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 3

WebCode	Additional Comments
VEB2PP	Questioned expended cartridge cases Items 2 and 4 were discharged from the same firearm.
VFTYBM	The questioned cartridge cases (Item 2, 3, 4, 5) have been compared to each other. The samples share the same class characteristics. Moreover, several similitudes have been highlighted during the macroscopical comparison of the firing pin marks (bottom and drag), the ejector marks and the extractor marks.
WRT942	The three (3) cartridge cases, item 1 were discharged in the same known/recovered firearm. The cartridge cases, items 2, 3, 4 and 5 were all discharged in a different firearm.
Y6UNZG	<p>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 reviewed and compared. If the class characteristics of the toolmarks are not clearly different, the examination moves to a second stage using comparative microscopy. A microscopic comparison examination consists of a search of the impressed and striated marks present in two toolmarks to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued: 1) 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 (No Conclusion): 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 variation in substrate, changes in tool working surfaces from wear, corrosion, and damage, or the employment of unusual tool/work piece orientations, 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.</p>
YMUKPR	Technical notes: Class characteristics are defined as measurable features of a firearm/tool

TABLE 3

WebCode	Additional Comments
ZLVWRN	<p>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.</p> <p>Should a suspect firearm be recovered please submit and reference the above CC#.</p> <p>Sufficient agreement is related to the significant duplication of random toolmarks as evidenced by a pattern or combination of patterns of surface contours. "Sufficient agreement" exists between two toolmarks means that the agreement is of a quantity and quality that the likelihood another tool could have made the mark is so remote as to be considered a practical impossibility. The container number corresponds to the property number.</p>
ZR7WYD	<p>The identification is based on reproduced patterns of impressions in the firing pin impression and supporting pattern reproduction agreement in the breechface impression.</p>

-End of Report-
(Appendix may follow)

Test No. 21-5261: Firearms Examination

DATA MUST BE SUBMITTED BY **July 26, 2021, 11:59 p.m.** TO BE INCLUDED IN THE REPORT

Participant Code: U1234A

WebCode: L8LAEQ

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

Scenario:

Police are investigating a shooting outside of a nightclub. Investigators recovered four expended cartridge cases at the scene - three from the parking lot and one from the grass area near the parking lot. A suspect was apprehended later that day and police seized a Taurus Millennium PT140 Pro handgun from his possession. Three rounds of PMC Bronze 40 S&W 180 grain FMJ ammunition (which were consistent with the cartridge cases found at the scene) were fired with the suspect 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 weapon 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 inscribed with its item number.

Items Submitted (Sample Pack F1):

Item 1: Three expended cartridge cases discharged from the suspect's weapon (known).

Item 2: First expended cartridge case recovered from the parking lot (questioned).

Item 3: Second expended cartridge case recovered from the parking lot (questioned).

Item 4: Third expended cartridge case recovered from the parking lot (questioned).

Item 5: One expended cartridge case recovered from the grass area near the parking lot (questioned).

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)?

<i>Item 2</i>	Yes <input type="radio"/>	No <input type="radio"/>	Inconclusive* <input type="radio"/>
<i>Item 3</i>	Yes <input type="radio"/>	No <input type="radio"/>	Inconclusive* <input type="radio"/>
<i>Item 4</i>	Yes <input type="radio"/>	No <input type="radio"/>	Inconclusive* <input type="radio"/>
<i>Item 5</i>	Yes <input type="radio"/>	No <input type="radio"/>	Inconclusive* <input type="radio"/>

*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)