



Serial Number Restoration

Test No. 21-5250 Summary Report

Each participant received a sample pack containing a piece of metal bar stock, which had been stamped with a six-character serial number that was then obliterated. Also included was a piece of aluminum bar stock intended as a standard for the size, shape and positioning of the stamped characters. Participants were asked to restore the obliterated serial number and report their findings. Data were returned from 255 participants and are compiled into the following tables:

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****Please Note:** Bracketed "[]" responses in Table 1: Recovered Characters represent data that was mentioned in tables 2 and/or 5. These results were not originally reported in Table 1. See the Summary Comments on page 3 for more details.

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 consisted of a piece of steel bar stock that contained an obliterated serial number (Item 1) and a piece of aluminum bar stock intended as a standard for the size, shape, and positioning of the stamped digits. Participants were requested to attempt to restore the obliterated serial number utilizing their laboratory restoration methodologies and report the recovered serial number. The serial number to be restored consisted of 6 characters (B7JNA9).

SAMPLE PREPARATION:

Each sample set contained a piece of steel bar stock that was stamped with six characters (B7JNA9). The serial number was then obliterated by a milling machine.

A piece of aluminum bar stock was also included in the sample as a reference standard. The alphanumeric characters provided are digits 0-9 and letters A-F, H, J, K and N.

SAMPLE SET ASSEMBLY:

Each Item 1 bar stock and aluminum standard bar stock were separately enclosed in chip board, with the sides taped for security and then placed in their respective pre-labeled envelopes. Every sample pack was packaged to contain an Item 1 and aluminum standard. This process was repeated until all of the sample packs were prepared. Once verification was completed, all sample packs were sealed with a piece of evidence tape and initialed "CTS."

VERIFICATION:

Although all three predistribution laboratories noted six characters in the sample, two of the three labs noted other possibilities for the fourth character, which were similar in shape ("N", "H"). These inconsistencies reported by predistribution did mirror some of the results that were seen in the general population. All three predistribution laboratories used a combination of magnetic and chemical restoration methods.

Summary Comments

This test was designed to allow participants to assess their proficiency in the restoration of an obliterated serial number. Participants were provided with a piece of metal bar stock that contained an obliterated serial number (Item 1) and a piece of aluminum bar stock intended as a standard for the size, shape and positioning of the stamped characters. Participants were requested to restore the obliterated serial number utilizing their laboratory recovery methodologies and report the recovered serial number. The serial number to be restored consisted of six characters (B7JNA9). (Refer to Manufacturer's Information for preparation details.)

In Table 1: Recovered Characters, many participants did not provide a response for some characters. However, CTS reviewed the data and determined that most of those participants provided one or more possibilities in the Table 2: Conclusions and/or Table 5: Additional Comments sections. Therefore, any bracketed "[]" responses in Table 1 represents data that was not originally reported in Table 1, but was mentioned as a possibility in other tables. If the expected character was included in the possibilities listed in brackets, then the response was not highlighted as inconsistent. Additionally, for the first character, the data supports that other than the expected character "B", the number "8" was frequently reported. CTS recognizes that these characters are very similar in shape and therefore, have accepted an "8" for the first character and it will not be highlighted as inconsistent.

Of the 255 responding participants in Table 1, 183 (72%) were able to restore six characters on the Item 1 bar stock. However, not all of the characters reported were consistent with the Manufacturer's Information. Those inconsistencies are highlighted in Table 1. CTS reviewed the reported data for each character individually and noted that although five of the six characters had a high recovery percentage (greater than 80%), most participants had difficulty with the 4th character. Therefore, results reported for the 4th character were excluded from the consensus evaluation and these results were not highlighted.

In regards to the remaining five characters, 181 participants (71%) restored all characters consistent with the Manufacturer's Information. Thirty-nine participants restored four of the five characters, sixteen participants restored less than four characters and nineteen participants were unable to restore any of the characters of which were reported in the Manufacturer's Information.

In Table 3 (Sample Preparation), the majority of participants used polishing, sanding, or visual methods to prepare their sample. In Table 4 (Recovery Methods), the majority of participants used a combination of both chemical and magnetic restoration methods. No trends were seen between the methods used and the challenges experienced by participants.

Multiple comments regarding the testing material in this test were noted and will be considered in future test designs.

Recovered Characters

Please record the recovered characters below.

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
247GU3	-	-	-	-	-	-
287WXJ	8	7				9
29YTKR	B	7	J	N	A	9
2B6BL9	?	?	?	?	?	?
2DTMKE						
2EPZ6L	0/B/8	7	J(3?)	H(N?)	A	9
2GDC6R	B	7	J	5	A	9
2KXEVX	? [B,8]	7	J	?	A	9
2LBV9B	8	7	J	H	A	9
2MJ9QD	B	7			A	9
2P8KPH	* [B,8]	7	3	*	*	9
2RD3NE	B	7	J	N	A	9
2RW4C2	[B,E,8]	7	[J]	5	A	9
2UGX8G	8	7	J	* [H,N]	A	9
2X3MRU	[B,8]	7			A	9
2Z96PP	B	7	J	N	A	9
3B3VUU	B	7	J	N	A	9
3DQ8TZ	B OR 8	7	J	H OR 5	A	9
3L7VLF	B	7	J	[H,N]	A	9
3MXUZE	B	7	0	N	A	9
3RTL9B	B	7	J	7	A	9
3W7GUZ	B	7	? [J,3]	? [H,N]	A	9
3XHFQU	B	7	J	N	A	9

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
42WDWW	? [B,8,3]	7	?	?	A	? [9,0,D]
44G8PQ	B	7	J	N	A	9
47A4DK	B	7	J	* [H,N]	A	9
4AJGVJ	C	7	J	5	A	9
4FDDKA	8	7	J	H	A	9
4H2PJF	5	7	J	N	A	9
4MWGRC	B	7	J	N/H/K	A	9
4P3W8V	* [B,D]	7	J	? [H,K]	A	#
4YP3X8	B	7	J	*	A	9
62BY7X	B	7	J	H [N]	A	9
636ULF	B/8	7	?	?	?	B/8/9
64DXGQ						
673BYA						
67LCNW	? [B,8]	7	J	N	A	9
6C83AR	* [B,8]	7	J	* [H,K,N]	A	9
6CQV3P	B	7	J	5	A	9
6F8E7R	* [B,8]	7	J	* [H,K,N]	A	9
6GKTRF	B	7	J	N	A	9
6HWRNA	B	7	J	N	A	9
6KK4MF	B	7	J	N	A	9
6V3KFM	B	7	J	N	A	9
6YMM7T	B	7	J	K	A	9
762XQ8	B	7	J	? [H,N]	A	9
79Z9M8	B	7	3?	5?	A	9
7AH3MG	?	?	?	?	?	?

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
7BBYAP	[B,D]	7	[3,8]	[N,H]	A	9
7CPKLC	B	7	J	5	A	9
7ERJW6	B	7	J	*	A	9
8DAPUA	8	7	?	H OR N	A	9
8K2UVQ	* [6,8]	* [2,7]	?	5	A	9
8MZAZ9	B	7	J	N	A	9
8PNLYD	B	7	J	?	A	9
8TCNYE	* [B,8]	7	J	?	A	9
8UYZGC	6	7	J	N	A	9
8ZQ8YK	B/8	7	J	N	B/8	9
92YJGM	[B,D,8]	7		[N,H]	A	9
96CJDD	B	7	J	N	A	9
99ZVCJ	B	7	J	?	A	9
9B3TMC	B	7	J	?	A	9
9D9A3V	- [B,8]	- [7]	- [J, 4]	- [5]	- [A]	9
9E6RY6	B	7	?	?	A	9
9GT4XA	B	7	J	[H,K,N]	A	9
9JETHM	B	7	J	N	A	9
9LNXVB						
9LZUZF	B	7	J	K	A	9
9NN7YL	B	7	J	N	A	9
9RBNG7	8	7	J	N	A	9
9UG7F3	B	7	J	5	A	9
9WK2Y6	[B,6,8]	7	3	H	A	[9]
9XYHZP	* [B,8]	7	J	N	A	9

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
9Y9DYB	B	7	J	[H,K,N]	A	9
A6RZ7L	B	7	J	?	A	9
ABJAFJ	8	7	J	N	A	9
ACV292	B	7	J	? [H,N]	A	9
AFD4DK	B	7	J	N	A	9
AMEJ28	B	7	J	N	A	9
AMTZ3R	B	7	J	N	A	9
AN8CYC	* [B,6,8]	7	J	** [H,K,N]	A	9
APY9LK	B	7	J	N/H	A	9
AQRCXR	8	* [7]	* [C,E]	* [5]	* [4]	9
ATJACQ	? [B,8]	7	J	? [N,H]	A	? [9,0]
ATYJGK	B	7	J	% [H]	A	9
AUD6T8		7				9
B4UC3G	* [B,8]	7	J	N	A	9
BAKLDE	B	7	J	* [H,N]	A	9
BVZ4KB	8					9
BY32TH	B	7	J	N	A	9
C4DEBG	8	7	J	H	A	9
C6HZZ3	B	7	J		A	9
C7F9DR	? [B,8]	7	J	?	A	? [3,8,9]
CC7MV8	B OR 8	7	J	N	A	9
CE9L7Z	B	7	J	N	A	9
CJL7F8	8	7	* [J,0]	? [H,N]	A	9
CKZTP9	8	7	J	H	A	9
CZAJRD	B	7	J	N	A	9

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
D92E43	[B,8]	7			A	9
DACCHK	B	7	J	N	A	9
DCZNGP	B	7	J	?	A	9
DJG9GG	B	7	J	N	A	9
DKHW6L	* [B,8]	7	J	N	A	9
DTN2VH	8	7	J	N	A	9
DU3DPF	8	7	J	N	A	9
E3RKMC	B	7	J	N	A	9
E3T9AG	B OR 8	7	J	?	A	9
E6HMTZ	?	7	?	?	A	9
E6UJX6	B	7	J	1	A	9
EAC4Z8	B	7	J	N	A	9
EDR9E9	8 [B]	7	J	H [N]	A	9
EEMU8Z	B	7	J	H OR N	A	9
EKDYAG	B	7	J	K	A	9
EMYQC7	[B,8]	7	[J,0]	[H,K,N]	A	9
EP69B3	[B,8]	7	J		[A,4]	9
ER97JA	8	7	J	1	A	9
EV8HFA	B	7	J	?	A	9
F9CZQA	* [B,8]	7	J	N	A	9
F9FH XK	8	7	J	N	A	9
FBHDGN						
FBZCPE	B	7	J	N	A	9
FEE87C	*	7	J	* [H,N]	A	9
FH2NNW	?	7	?	?	?	?

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
FL4HNM	8	7	[0,6]	[5]	A	9
FNPCJ3	[B,8]	7	[J]		A	9
FWFWMF	8	7	J	N	A	9
FYPYBY	B	7	J	N	A	9
G766KB	B	7	J	? [N,H]	A	9
G7LCRE	* [B,8]	7	J	* [H,N]	A	9
GEZX2H	B	7	J	H / N	A	9
GKK3PC	B	7	J	N	A	9
GMM2Z6	D			C	A	9
GUQ8F8	B	7	J	N OR H	A	9
GV4GTE	B	7	J	N	A	9
GVG7U7	B	7	J	N	A	9
GVKT9Y						
GZZ2WX						
H23J9Y	B	7	J	N	A	9
H2MYN2	8	2	*	5	A	9
H8TTHX	5	7	J	H	A	9
HAKPDH	B	7	J		A	9
HBVPAD	B	7	* [3,J]	# [K,5]	A	9
HDGH38	[B,8]	7	J	N	A	9
HDJ29H	[B,8]	7	J	N	A	9
HK49N3	8	7	J	* [H,N]	A	9
HMAMEG	B	7	-	-	A	9
HPAYR9	B	7	J	H	A	9
HVD77B	B/8	7	J	K	A	9

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
HWT6QZ	B	7	J	H	A	9
J3DKUX	[B,8]	7	[J,3]	N	A	[9]
J7DWPX	[B,8]	7	[J,3]	[H,N]	A	[9]
JAUEQF	* [B,8]	7	J	N	A	9
JBA322	8	7	J	?	?	9
JFLJKJ	B	7	J	N	A	9
JP8MRJ	B	7	J	N	A	9
JTRGMX	B	7	J	N	A	9
JZLLFY	B	7	J	1	A	9
K39MW8	8	7	J	?	A	9
KEPA8T	B	7	J	* [H,N]	A	9
KKAK3A	-	7	J	-	A	-
KVA28T	?	?	?	?	?	?
KWMUK8	B	7	J	N	A	9
KY9C3T	E	7	J	5	4	9
L2YVPC	B	7	*	*	A	9
L68KK6	2	7	J	7	A	9
L9T33P	B	7	J	N	A	9
LB436C	B	7	3	5	A	0
LBWXL T	B OR 8	7	J	N	A	9
LFRRJU	8 OR B	7	J	N OR H	A	9
LJRZM4	8	7	3	5	A	9
LJTNBA	B	7	J	N	A	9
LLH3TR	B	7	J	?	A	9
LMTY7A	8	7	J	* [H,K,N]	A	9

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
LWF37W	* [B,8]	7	J	?	A	9
MJRB38	* [B,8]	7	J	N	^ [A,4]	9
MLD4V2	B	7	J	H	A	9
MPCHHR	B	7	J	H	A	9
N2M8WM	F	2	5	B	9	D
N4DEEY	B	7	J	? [N,H]	A	9
N4NF2X	B	7	J	[H,K,N]	A	9
N72QE4	B	7	J	H	A	9
NBB4V3	B	7	J	N	A	9
NDXLDN	B	7	J		A	9
NMP2Z7	B	7	3 OR J	5	A	9
NRHQGX	?	7	J	?	A	9
NTXHH8	? [B,8]	7	?	?	A	9
NVU9F7						
P24NPU	B	7	N	1	A	9
P2H9H6	B	7			A	9
P7UXYT	8	7	J	[H,K,N]	A	9
P9MRWW	B	7	J	H [N]	A	9
PAUAVT	8	7	J	? [H,K,N]	A	9
PFZ3PN	? [8]	7	J	? [H,N]	A	9
PNEPYR	8 / B	7	J	K	A	9
PQL8WN	* [B,8]	7	J	* [H,K,N]	A	9
PRC7BL	B	7	J	K	A	9
PXHL6	B	7			A	9
Q4JFD3	8	7	0	H	A	9

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
Q4ZRUM	B	7	J	* [H,K,N]	A	9
QL3CUV	B	7	[J,U,0]	[H,N]	A	9
QQW7RW	8/B/0	7	J/3	N/H/M	A	9
QXYFXP	B	7	J	N	A	9
QZ3BGT	B	7	J	[H,K,N]	A	9
R2EAC2	8	7	J	N	A	9
R4JQT7	B	7	J	(N)	A	9
R7BP84						
R7NМУZ	B	7	0	N	A	9
R8LQT3						
RH2MQT	B	7	J	5	4	9
RJA3WZ	B	7	J	N	A	9
RKPYPY	B	7	J	H	A	9
T34XAM						
TKK3UU	B	7	J	1	A	9
TM9DTY	8	7	?	?	A	9
TWDNZP	? [B,8]	7	J	N	A	9
TZFLBH	B	7	J	? [H,N]	A	9
UAH4JY	B	7	J	N	A	9
UH9PPX	B	7	J	N	A	9
UM74CM		7	J	5	[A,4]	[9]
UQ3UHY	B	7	J	? [N,1,5]	A	9
UU6TTQ	B	7	J	[H,N]	A	9
UWT6RW	B	7	J	N	A	9
V6J6LF	B	7	J	5	A	9

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
VFG6YJ	B	7	J	N	A	9
VLTTYF	?	?	?	?	?	?
VZTQ4Z	* [B,8]	7	J	# [H,N,1]	A	9
W2XM4U	B	7	J	N	A	9
WAAYWL	B/8	7	J	N	A	9
WHPK7P	B	7	[J,U,0]	[H,N]	A	9
WKTFPT	B	7	5	* [N]	* [0,8]	9
WYAB6P	B	7	J	N	A	9
X3N9AQ	B	7	J	* [H,N]	A	9
X42T32	-	-	-	-	-	-
X4Z6FV	8	7	J	N	A	9
X6Q4UU	B	7	J	N	A	9
XEYTF6	5	7	3	H [N]	A	9
XPKUXZ	B	7	J	N	A	9
XTGNMN	B	7	?	?	A	?
XV8MAZ	B	7	J	H OR N	A	9
XVM7UW	* [B,8]	7	J	?	A	9
XW2FYQ						
XXBHT3	? [B,8]	7	? [J]	?	? [0,4,A,D]	9
Y4WV8V	B	7	C	1	A	9
Y7NQU4	B	7	J	H [N]	A	9
Y8VARZ	B	7	J	? [H,K,N]	A	9
Y99KNJ	B	7	J	* [H,N]	A	9
YCBGFY	B	7	J	N	A	9
YG4QHK	B	7	3	H	A	9

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
YNZHQE	B	7	J?	?	A	9
Z2N4AE	B	7	J	M	A	9
Z4CF9K	B	7	* [J,0]	# [N,H]	A	9
Z6MDL3	B	7	8	N	A	9
ZDGQFA	B	7	J	? [H]	A	9
ZKZUMC	B	7	J	N	A	9
ZMN6LH	B	7	J	?	A	?

Response Summary						Participants: 255
	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
Expected Response	B	7	J	N	A	9
Count	221	233	196	154	224	230
Percent	86.7%	91.4%	76.9%	60.4%	87.8%	90.2%

Conclusions

TABLE 2

WebCode	Conclusions
247GU3	The serial number had been erased by milling and was not able to be restored.
287WXJ	Attempts to raise the obliterated serial number of the stainless steel bar, specimen #1, by chemical methods revealed the following partial serial number: 87 __ _ 9. Further attempts to raise the missing characters were unsuccessful.
29YTKR	For the received piece of metal identified internally in the Ballistics Unit as E1-21-0537: - His serial number (revealed) is B7JNA9. It is observed that the piece of metal presented alteration in the central part of one of its sides, from this area it was possible to recover an alphanumeric sequence through the development process. It should be noted that the characteristics revealed through this process are not permanently recovered and the wear persists on the piece of metal (*).
2B6BL9	One metal bar stock (having weak magnetic properties), with a "serial number" obliterated by abrasion. Marked M-1. Magnetic particle inspection and chemical restoration techniques were conducted with unsuccessful results. One character is a possible "A". Unable to determine character placement or structure. Case number scribed on M-1 for identification.
2DTMKE	Item 1 was physically and microscopically examined. The serial number area of Item 1 was prepared and chemically processed but could not be restored.
2EPZ6L	The erased number consisted of 6 characters, not all of which i was able to restore with certainty; consequently, more than one option is possible for three of the characters, and my best attempt to restore the number is as follows: O/B/8, 7, J(OR 3), H (OR N), A, 9.
2GDC6R	The obliterated area on the piece of 303 stainless steel bar stock in item 1 was chemically etched and the serial number was determined to be B7J5A9.
2KXEVX	Item 1 was examined and found to have an obliterated area. Standard restoration techniques applied to Item 1 revealed "?7J?A9". The first ? character is a "B" or "8". The second ? character could not be fully restored.
2LBV9B	Serial number restoration techniques were applied to Item #1. The serial number was determined to be 87JHA9.
2MJ9QD	Serial number restoration was performed on item 1.1. The characters B7??A9 were restored. The question marks represent characters which could not be determined due to a lack of clarity and detail.
2P8KPH	Serial number restoration techniques were applied to the piece of metal bar stock (Item 1-1). The partially restored serial number was determined to be *73**9. The first asterisk represents either an 8 or B. The second and third asterisks were not successfully restored.
2RD3NE	We strongly support the hypothesis that piece has serial number B 7 J N A 9.
2RW4C2	During my examination of the piece of metal, I observed that the serial number had been removed. A chemical examination partially recovered the serial number as _7_5A9 with the first character either a B, E or 8 and the third character possibly a J. During my examination, I obtained photographs which I am able to produce.
2UGX8G	The obliterated serial number of Item 1 was partially restored to read 87J*A9, with the asterisk (*) representing possible alpha characters H or N.
2X3MRU	The serial number of the stainless steel bar stock, described in the item 001, could not be restored due to its high grade of obliteration,
2Z96PP	I examined the metal plate 'Item 1' and found there is a filled surface bearing no numbers. Upon electrochemical treatment on the filed surface, the number 'B7JNA9' was restored. Based on the findings, I am of the opinion that the original number on the metal plate has been filed and was restored back and read as 'B7JNA9'.
3B3VUU	The obliterated serial number on the piece of bar stock (Item 1) was magnetically processed and chemically restored to read "B7JNA9".

TABLE 2

WebCode	Conclusions
3DQ8TZ	An obliterated area was found in the middle of Item 1. Standard restoration techniques were used to reveal the following characters: *7J*A9 where the first asterisk is either a B or 8 and the second asterisk is either an H or 5.
3L7VLF	The serial number on item 1 was partially restored to B7J*A9. *The remaining character is either H or N.
3MXUZE	Visual examination with mechanical and chemical processing of the bar stock (Item 1) revealed the obliterated serial number to read: B70NA9. Evidence examined for this report will be returned to the [Laboratory] Quality Manager.
3RTL9B	Item 1's serial number was mechanically and chemically restored to read "B7J7A9".
3W7GUZ	The following characters were recovered: B 7 ? ? A 9. 3rd character: J or 3. 4th character: N or H
3XHFQU	The serial number is milled off. The serial number (B7JNA9) was restored by the acid etching process. Polishing, Modified Fry's and Nickel & Alloy reagents were used for the restoration. A chemical reaction was observed when the acid etching solution was applied to the surface of the firearm. Disposition: The above item will be held in the Firearms Laboratory Section.
42WDWW	I was requested to examine the metal block and to restore any erased serial numbers. There was a broad band of metal removal on one side of the metal block within which were visible grinding marks. Number restoration techniques were applied to the area of grinding marks. A single line of characters was revealed. Some of the restored characters were not perfectly clear. The line of characters was "? 7 ? ? A ?"; where the first "?" character was unclear but appeared to be an "8", but could also have been a "B" or a "3"; the second and third "?" characters were unclear and unable to be interpreted, the last "?" character was unclear but appeared to be a "9", but could also have been a "0" or a "D".
44G8PQ	Examination of the surface of the stainless steel bar revealed evidence of an obliterated serial number. The surface was treated and the following original serial number was restored: B7JNA9
47A4DK	The examination and processing of the obliterated serial number on the Item 1 bar stock was partially restored to read "B7J*A9". The asterisk represents a character that was partially restored and is most likely a "H" or an "N".
4AJGVJ	The serial number has been restored by using the method MagnaFlux.
4FDDKA	The serial number on the steel bar stock was restored to read 87JHA9.
4H2PJF	Serial number restoration techniques were applied to item 1. The number was determined to be 57JNA9.
4MWGRC	Exhibit 1 was examined with mechanical, magnetic and chemical methods. The obliterated serial number was partially restored to be: B7J@A9 "@" denotes an unrestored alphabetic character and could be either an N, H or K.
4P3W8V	The serial number was partially restored to *7J?A#, where * is possibly a B or D, ? is possibly an H, K, or N, and # is an undetermined character
4YP3X8	The serial number on the metal plate (Exhibit 1) was mechanically and chemically treated and restored to read B7J*A9. The * represents an unrestored character. No analysis was performed on the metal plate (Exhibit 2).
62BY7X	Item 1A was physically and chemically processed in an attempt to recover the obliterated serial number. The restored serial number appeared to be B 7 J H A 9; however, the 'H' could have been an 'N.' Item 1B was used as a reference to compare to the restored characters on item 1A.
636ULF	EVIDENCE SUBMITTED: Lab Item #; Agency Item #; Description. 1; SNR1: One (1) piece of 303 stainless steel bar stock with suspected obliterated serial number. CONCLUSIONS OF ANALYSIS The serial number on the 303 stainless steel bar stock, item 1, was partially restored to read ^ 7 ***# with the ^ possibly being a B or 8 and the # possibly being an 8 or B or 9. The three * in the middle never developed and are unknown.

TABLE 2

WebCode	Conclusions
64DXGQ	Further examination of the submission 001 found that the serial number was obliterated. Attempts to restore the serial number were unsuccessful.
673BYA	Attempts to restore the serial number on the item 1 piece of bar stock were unsuccessful.
67LCNW	Serial Number Restoration Analysis: Methodology: Physical (Visual Examination), Microscopy (Comparison Microscope), Chemical (Reagent Etching), MPI (Magnetic Particle Inspection). Serial number restoration procedures revealed the serial number on Item 1, the metal bar stock, to be: ? 7 J N A 9. ? indicates an unidentifiable character, possibly a B or an 8.
6C83AR	This report refers to exhibits by Lab Number. The following results only apply to the items tested. The obliterated area of the bar stock (Exhibit 1) was polished, magnetically and chemically processed and partially restored to read the serial number "*7J*A9". The first asterisk represents either a "B" or "8". The second asterisk represents either an "N", "H" or "K". These conclusions conform with the relevant [Laboratory] policy on Uniform Language for Testimony and Reports available at [Website].
6CQV3P	The alphanumeric sequence of the piece of metal was found to be altered. After the analysis, the sequence concordant with the characteristics evaluated in the comparative material was revealed. The detected alteration may remain perceptible after the analyzes performed. In conclusion: The piece of metal analyzed is completely identified despite the alterations detected.
6F8E7R	This report refers to exhibits by Lab Number. The following results only apply to the items tested. The obliterated area on the bar stock (Exhibit 1) was polished, then magnetically and chemically processed. The serial number "*7J*A9" was observed after processing. The first asterisk represents a "B" or an "8". The second asterisk represents an "H", "K" or "N". These conclusions conform with the relevant [Laboratory] policy on Uniform Language for Testimony and Reports available at [Website].
6GKTRF	The metal bar from item 1 was examined and it was determined to exhibit an obliterated area. Attempts were made to restore this area using polishing, and chemical and electrolytic etching techniques. Obliterated characters were restored and determined to be: B7JNA9.
6HWRNA	Restoration of obliterated stamped marking was performed on the questioned surface of the Item 1, and the restored serial numbers were found to be "B7JNA9".
6KK4MF	The obliterated serial number on Item A1-1 was restored and found to consist of six alphanumeric characters, as follows; B-7-J-N-A-9.
6V3KFM	The original number was grinded and have been restored, read as B7JNA9.
6YMM7T	Item 1 - One piece of metal bar stock. The submitted specimen marked as Item 1 was examined and identified as a metal bar stock with a suspected obliterated serial number. The obliterated serial number was chemically processed and successfully restored to read: "B7JKA9".
762XQ8	A serial number restoration was attempted on the bar stock using chemical etching techniques. The serial number was partially restored to read B7J?A9.
79Z9M8	A serial number restoration was attempted on Item 21-5250(c) using magnetic particle inspection, chemical etching techniques, and sanding. The serial number was partially restored to read B7??A9. The third character may be a '3' and the fourth character may be a '5'.
7AH3MG	An attempt to restore the obliterated serial number on the stainless steel bar stock was made using mechanical polishing and chemical etching. The full serial number could not be restored. One of the characters could be a "6", "8", or "9" and another character had a rounded top or bottom. The restoration was documented with notes and photographs.
7BBYAP	The serial number of the stainless steel bar stock, described in the item 001, could not be restored, due to its high grade of obliteration.
7CPKLC	[No Conclusions Reported.]
7ERJW6	The serial number on the metal plate (Exhibit 1) was mechanically and chemically treated and restored to read B7J*A9. The * represents an unrestored character. No analysis was performed on the metal plate (Exhibit 2).

TABLE 2

WebCode	Conclusions
8DAPUA	The obliterated serial number was partially restored and interpreted to read 87(?)*)A9 where the (?) is an unknown character and the (*) is either an H or N.
8K2UVQ	The piece of 303 stainless steel bar stock was processed with acid etching chemicals and Magnaflux to restore the obliterated serial number. The serial number was partially restored as **?5A9. The first asterisk could be a 6 or an 8. The second asterisk could be a 2 or a 7. The third character could not be restored.
8MZAZ9	After using special chemical product for iron, we managed to restore this following obliterated serial number : "B7JNA9"
8PNLYD	Items – Description/Visual Examination. Item 1: A piece of 303 stainless steel bar stock with suspected obliterated serial number. Examination Results: Using chemical & physical serial number restoration techniques, an attempt was made to restore the obliterated serial number with the following results: Serial number: B 7 J ? A 9 was restored on Item 1. The depth of the metal removed from the serial number area precluded a successful full restoration. [Name] Firearm and Toolmark Examiner
8TCNYE	Examination of the Item 1 submitted steel bar stock found the serial number to have been obliterated. Physical and chemical processing of the submitted Item 1 steel bar stock partially restored the obliterated, original serial number to read "**7J?A9". The asterisk represents a character that is either an 8 or B. The question mark represents an unrestorable character.
8UYZGC	The serial number on the submitted metal plate (Item 1) was recovered to read 67JNA9.
8ZQ8YK	Using standard restoration techniques, the obliterated serial number on item 1 was partially restored to read: "B or 8, 7, J, N, B or 8, 9".
92YJGM	The serial number of the piece of metal, described in Item 1, could not be restored due to its high degree of mutilation.
96CJDD	Restored number is B7JNA9.
99ZVCJ	A serial number restoration was attempted on the stainless-steel bar stock using chemical etching techniques. The serial number was partially restored to read B 7 J ? A 9. The aluminum bar stock was not further examined.
9B3TMC	Items – Description/Visual Examination. Item 1: One (1) stainless steel bar stock with suspected serial number obliterated. Examination Results: Using chemical & physical serial number restoration techniques, an attempt was made to restore the obliterated serial number with the following results: Serial Number: B 7 J ? A 9 was restored on Item 1. The depth of metal removed from the serial number area precluded a successful full restoration.
9D9A3V	Chemical etchants were applied to the area of the obliterated digits with limited success. Although it could be seen there were six digits, only the last numeral was sufficiently clear to be unambiguous; the number 9. The first five digits could not be restored with sufficient clarity to be certain beyond doubt as to what letter or number they were.
9E6RY6	The analysis was initiated on March 8, 2021 and the results of the physical and chemical restoration processes are as follows: The serial number on the stainless steel bar stock (Item 1) was partially restored to read B7??A9.
9GT4XA	The serial number on item 1 was partially restored to B 7 J * A 9. *The remaining character is either H, K or N.
9JETHM	The alphanumeric sequence revealed in the piece of questioned aluminum identified as E1-21-0521 (Test No. 21-5250 Item 1) corresponds to "B7JNA9".
9LNXVB	The suspected obliterated serial number on the steel bar stock (Item 1) was processed using physical, chemical, and magnetic methods. Attempts to restore the number were unsuccessful.
9LZUZF	The serial number of the piece of bar stock, Exhibit SNR1, was determined to be: B 7 J _ A 9 The fourth character is probably a "K".

TABLE 2

WebCode	Conclusions
9NN7YL	On analysis, i found there was a filling mark on the surface of the steel bar. On electrochemical treatment on the filled surface region, i found a number B7JNA9. Hence, i am of the opinion that the number of the steel bar was tempered and the original number was B7JNA9.
9RBNG7	[No Conclusions Reported.]
9UG7F3	The restoration revealed the following characters: B 7 J 5 A 9
9WK2Y6	THE ANALYSIS OF THE ABOVE-LISTED EVIDENCE WAS INITIATED ON MARCH 18, 2021. ITEM 1 WAS VISUALLY EXAMINED. ADDITIONALLY, USING POLISHING, MAGNETIC, AND CHEMICAL RESTORATION METHODS, THE SERIAL NUMBER ON ITEM 1 WAS PARTIALLY RESTORED TO READ THE FOLLOWING: ? 7 3 H A ?. THE FIRST CHARACTER COULD BE THE FOLLOWING: B, 6, OR 8. THE LAST CHARACTER COULD BE THE FOLLOWING: 9. THE LISTED EVIDENCE WAS ANALYZED ON 3/18/2021 AND WILL BE RETAINED IN THE FIREARMS ANALYSIS UNIT'S FIREARMS EVIDENCE VAULT.
9XYHZP	Attempts to restore the obliterated serial number of Lab Item 1 were partially successful. The partially restored serial number is *7JNA9 with the * representing either B or 8.
9Y9DYB	Standard laboratory procedures for restoring characters stamped in metal were applied to the milled portion of the submitted bar stock. The restored characters are "B-7-J-*-A-9". The "*" in the fourth position represents a character with features consistent with being a "K", "N" or "H". A definitive conclusion on the character in the fourth position was not reached.
A6RZ7L	The serial number "B7J?A9" was recovered from the piece of steel bar stock, identified Item 1. The "?" symbol can not be revered and could be any number o letter.
ABJAFJ	The restoration procedure was applied to the stainless steel bar and the alphanumeric sequence 87JNA9 was obtained
ACV292	One (1) bar stock, measuring 1"x 2 5/8" with a 1"x1" section removed from the center. Serial number restoration was performed using chemical etching and magnetic particle inspection process. Partial serial number of B7J?A9 was recovered, ? is a possible H or N.
AFD4DK	The restored number "B7JNA9" is the original serial number.
AMEJ28	Date Worked 03/12/2021. The serial number is ground off. The serial number (B7JNA9) was restored by acid etching. Sanding, Polishing and the Fry's reagent were used for the restoration. A chemical reaction was observed when the acid etching solution was applied to the surface area of the firearm. Evidence Submission XXX will be forward to the Property Custody Division.
AMTZ3R	EVALUATION: 1) Serial No. Restored as B7JNA9
AN8CYC	Examination and restoration of the obliterated area on the steel bar stock of Item 1 revealed the following characters: "*7J*A9". The * represents multiple possible characters. 1st character: B, 8 or 6; 2nd character: 7; 3rd character: J; 4th character: N, K, H, or 1; 5th character: A; 6th character: 9
APY9LK	The metal piece in question shows surface wear. It showed little degree of attraction to a magnet. For this reason, we proceeded to the chemical method, by which, it was possible to obtain a alphanumeric sequence corresponding to the shape of the alphanumeric characters provided as a standard sample. In the case of character number four, it was not possible to distinguish conclusively whether it is the letter "N" or an "H".
AQRCXR	The serial number of the CTS unknown was processed using mechanical polishing and chemical etching. The serial number was partially restored to: 8 * * * * 9.
ATJACQ	Number restoration revealed a line of characters that were "? 7 J ? A ?", where the first "?" was either a "B" or an "8", the second "?" was unclear but may have been an "N" or an "H", and the third "?" was unclear but may have been a "9" or a "0".
ATYJGK	The symbol "%" corresponds to a possible letter "H".

TABLE 2

WebCode	Conclusions
AUD6T8	The serial number was not fully restored. The restored characters were as follows: _ 7 _ _ _ 9. The " _ " were characters that were not fully restored.
B4UC3G	Attempts to restore the obliterated serial number of Item Q-1 were partially successful. The partially restored serial number is *7JNA9. The (*) represents either "B" or "8".
BAKLDE	I partially restored the serial number on Item 1 to read B7J*A9. The readability of the fourth character (*) varies with some angles of lighting. As a result, the "*" is most likely an N, but I could not eliminate the possibility that it could be an H.
BVZ4KB	The original serial number was removed by mechanical procedures (milling). After carrying out restoration work it was determined two of the six characters: First and last one: 8****9 ("*" means that we could not determine the character).
BY32TH	The obliterated serial number was fully restored to read "B7JNA9"
C4DEBG	The alphanumeric sequence revealed in the evidence identified as E1-21-0527 is B7JHA9. It is observed that it presented alteration in the area where the impression was located, which itself could be recovered through the restoration process. It should be noted that the characteristics revealed through this process are not permanently recovered and wear persists on the object.
C6HZZ3	The serial number on the metal plate (Exhibit 01) was mechanically and chemically treated and partially restored to read B7J*A9. The asterisk represents characters that could not be restored.
C7F9DR	I restored the serial number using Fry's reagent and mild heat. It read: ? 7 J ? A ?. The first, forth and last characters were only partially decipherable and could be interpreted in multiple ways. The first character could be read as 8 or B. The forth character blurred with the J from the previous stamping and was completely illegible. The last character could be read as 3, 8 or 9.
CC7MV8	The obliterated serial number of Item 1 was determined to be (B or 8) 7 J N A 9.
CE9L7Z	The obliterated serial number has been restored by using an acid etcht method (Wazau).
CJL7F8	Using a chemical restoration method, the obliterated serial number on the bar stock (item 1) was partially restored to read 8 7 * ? A 9, with the * possibly being a J or a 0 and the ? possibly being an H or N.
CKZTP9	Examination of Item 1 revealed the presence of an obliterated area on the center of the stainless-steel bar stock. This area was cleaned, polished and chemically processed and the serial number was fully restored to consist of six alphanumeric characters appeared to be 87JHA9. Based on the above findings, in my professional opinion, the original serial number on Item 1 was 87JHA9.
CZAJRD	The obliterated area was mechanically and chemically processed to restore the following serial number: B7JNA9
D92E43	Using standard physical and chemical restoration techniques, the obliterated serial number on item 1 was partially restored to read * 7 ** A 9. 1. The first digit could be either a B or an 8. 2. The third and fourth digits could not be restored
DACCHK	The serial number has been milled off. The serial number (B&JNA9) was restored by acid etching. Polishing and Modified Fry's reagent was used for the restoration. A chemical reaction was observed when the acid etching solution was applied to the metal surface.
DCZNGP	The serial number was partially restored to rea B7J?A9.
DJG9GG	The obliterated serial number was fully restored to read "B7JNA9"
DKHW6L	The obliterated serial number on Item 1 was partially restored to "*7JNA9" with the asterisk representing the first character as either the letter B or the number 8.
DTN2VH	1. Examination of Exhibit 1 revealed one ferromagnetic metal bar of dimensions 1.001" wide, 0.250" thick, and 2.643" long. One damaged area was observed on Exhibit 1. 2. The following characters were observed during restoration of the damaged area on Exhibit 1: 87JNA9 All measurements are approximate.

TABLE 2

WebCode	Conclusions
DU3DPF	The serial number of the piece metal identified item 1 is 87JNA9.
E3RKMC	Serial number restoration revealed the number B 7 J N A 9.
E3T9AG	The serial number was partially restored to read: ? 7 J ? A 9. The first character could be a B or 8. The fourth character could not be determined.
E6HMTZ	The analysis of the evidence was initiated on March 8, 2021. The Stainless Steel Bar Stock was visually examined. Attempts to restore the serial number using a dremel tool, magnetic methods, and chemical processing were partially successful. The partially restored serial number is ?7??A9.
E6UJX6	AFTER USE OF OUR STANDARD PROCEDURES FOR OBLITERATED SERIAL NUMBER RESTORATION WE FOUND THE FOLLOWING NUMBER (LEFT TO RIGHT) B7J1A9
EAC4Z8	Examination of the submitted bar stock revealed the manufacturer's applied serial number to have been obliterated. Physical and chemical processing of the bar stock restored the obliterated, original serial number to read "B7JNA9".
EDR9E9	The serial number of Item 1 was restored as 87JHA9.
EEMU8Z	The Item 1 serial number was restored and determined to be the following: B 7 J ? A 9. The 4th character could not be confirmed but appears to be either an H or an N.
EKDYAG	1. Examination of Exhibit 1 revealed one ferromagnetic metal bar with an area of obliteration. a. The bar measures 66.16mm long, 25.43mm wide, and 6.37mm thick. b. The obliterated area on Exhibit 1 was fully restored and the following characters were observed: B 7 J K A 9 All measurements are approximate.
EMYQC7	The obliterated serial number on the metal bar, item 1, was partially restored to *7**A9. The first asterisk represents either a B or 8. The second asterisk represents either a J or O. The third asterisk represents either an H, K, or N.
EP69B3	Using standard physical, chemical and magnetic restoration techniques, the obliterated serial number was partially restored to read *7J**9. The first digit could be an 8 or B. The fourth digit could not be restored. The fifth digit could be an A or 4.
ER97JA	Examinations to determine the serial number of Item 1 using magnetic particle inspection were inconclusive. The serial number of Item 1 was recovered using mechanical polishing and chemical etching techniques and was found to be: 87J1A9.
EV8HFA	Using magnetic and chemical methods, the obliterated serial number on Item 001 was partially restored to read B7J?A9 where ? represents an unknown character.
F9CZQA	Using a combination of mechanical and chemical restoration techniques, the serial number on the stainless steel bar (Item 1) was partially restored to read: * 7 J N A 9, where the asterisk (*) represents a partially restored character that is most likely an "8"; but a "B" cannot be completely eliminated.
F9FHXX	I undertook a magnetic particle inspection serial number restoration process and the serial number characters were identified to be 87JNA9. I further undertook a chemical etching serial number restoration process and the serial number characters were identified to be 87JNA9.
FBHDGN	The serial number had been obliterated and was unable to be restored.
FBZCPE	Upon analysis, I am opinion the obliterated serial number on bar stick was restored and interpreted as "B7JNA9".
FEE87C	Examination, magnetic and chemical processing of [Laboratory] Item 1 partially restored the serial number. The serial number was determined to be *7J*A9 (1st * could not be restored, 2nd * is either "H" or "N".
FH2NNW	One (1) Piece of stainless Steel (Approx. 2 5/8" x 1" x 1/4") Submitted with a suspected obliterated serial number. A One (1) inch square of surface removed by a drilled/cutting device. Unable to restore using chemical etching or magnetic process. Second digit possible "7". CTS # Scribed on back of bar stock by examiner for identification purposes.

TABLE 2

WebCode	Conclusions
FL4HNM	A partial serial number was recovered. The partially restored serial number was: 87*?A9. *=possible 0 or 6. ? most likely a 5
FNPCJ3	Examination and magnetic and chemical processing of the Q-1 metal bar partially restored the original obliterated serial number which was determined to be *7**A9.
FWFWMF	The procedure was carry out on the metal piece and it was able to restore the alphanumeric sequence 87JNA9.
FYPYBY	Item 1A The serial number on the bar stock was restored to read B7JNA9 using chemical etching techniques. Item 1B The item was used for reference during analysis.
G766KB	Examination of Item 1 revealed the presence of a defaced area. Item 1 was physically, chemically, and magnetically processed. The serial number was partially restored as: B7J?A9 N H. REMARKS: A question mark denotes the position of an unknown character. Beneath the question mark are possible choices for that character and indicate a partial restoration.
G7LCRE	The following partial serial number was recovered: *7J*A9. The first asterisk is likely a B or 8. The second asterisk is likely a H or N.
GEZX2H	The obliterated serial number of Item 1 was partially restored and appears to read "B 7 J ? A 9". The unrestored fourth character indicated by a "?" appears to correspond with either an "H" or an "N".
GKK3PC	Alphanumerics sequence "B7JNA9" was restored in the disturbe area of the objecta identified as E1-21-0525
GMM2Z6	[No Conclusions Reported.]
GUQ8F8	Through a combination of mechanical polishing, magnetic particle inspection, and chemical etching, the serial number was restored to read either B7JNA9 or B7JHA9.
GV4GTE	Steel bar identified as Item 1 has an obliterated area. By restoration process the alphanumeric sequence B7JNA9 was recovered.
GVG7U7	I restored the serial number through chemical etching, and in my opinion it is B7JNA9.
GVKT9Y	Item 1 was physically and microscopically examined. The serial number area of Item 1 was prepared and treated with chemical reagents. As a result of these actions, the serial number was unable to be restored.
GZZ2WX	Examination and restoration of the obliterated areas on Item 1 (a piece of stainless steel bar stock with suspected obliterated serial number) failed to reveal a positive orientation for the serial number placement. Partially restored characters were not interpreted as a serial number.
H23J9Y	The serial number is milled off. The serial number (B7JNA9) was restored by acid etching. Polishing, the Fry's reagent and nitric acid were used for the restoration. A chemical reaction was observed when the acid etching solution was applied to the surface area of the firearm. Disposition: The above listed evidence will be forwarded to the Property Custody Division.
H2MYN2	Serial number restoration techniques were applied to the submitted aluminum bar (Item 1). The partially restored serial number was 82*5A9. The * represents an unrestored character.
H8TTHX	The item 1 (LIMS item 1-1-1-1) bar stock with obliterated area was examined and processed using standard serial number restoration techniques. The serial number was restored to read: 5 7 J H A 9.
HAKPDH	Item 1 was a piece of 303 stainless steel bar stock. In the centre of one side of the bar was a recessed area that exhibited grinding to the metal surface. I chemically treated the ground metal surface for the purpose of recovering any characters that may have been previously stamped into the metal. As a result of this examination, I was able to distinguish the characters "B7J_A9". I was unable to recover the fourth character in the sequence. I have formed the opinion that the characters "B7J_A9" had previously been stamped on the metal surface and subsequently ground away.

TABLE 2

WebCode	Conclusions
HBVPAD	1. The obliterated area on Exhibit 1 was processed using standard serial number restoration techniques. The obliterated serial number was determined to be comprised of six (6) characters. Four (4) of the characters were observed/restored and two (2) partial characters were observed. The partial serial number was restored and appears as follows: B7*#A9. 2. The 3rd character (from left) is represented with an asterisk (*) was partially restored and could be a 3, J, or similar character. 3. The 4th character (from left) is represented with a number sign (#) was partially restored and could be a 5, K, or similar character.
HDGH38	The obliterated serial number (SN) on the metal piece (Item 1) could only be partially restored to read: * 7 J N A 9, where * appeared most like "B" or "8". The first character could not be further interpreted without a given expected SN format.
HDJ29H	The first letter/number could not be confirmed. It is believed to be either the letter B or the number 8. The magnetic particle method of restoration was used followed by chemical etching method.
HK49N3	Visual examination, polishing, and chemical treatment of the obliterated serial number on Item 1 was partially restored to read "87J*A9", with the asterisk representing possible alpha characters N or H.
HMAMEG	Using mechanical and chemical processes the following characteristics were recovered: B7--A9 where the -'s are unknown characters
HPAYR9	Serial number restoration revealed the number B 7 J H A 9.
HVD77B	A six digit alphanumeric serial number was successfully restored by chemical treatment to read: B/8 7 J K A 9. The first digit could not be fully deciphered and is either the number '8' or the letter 'B'.
HWT6QZ	The Item #1 piece of bar stock was physically and chemically processed. Its serial number was restored to read: B 7 J H A 9.
J3DKUX	Using standard laboratory physical and chemical restoration techniques, the obliterated serial number on Item #1 was partially restored to read: *7*NA*. The first character could be B or 8. The third character could be J or 3. The sixth character could be a 9.
J7DWPX	Using standard laboratory physical and chemical restoration techniques, the obliterated serial number was partially restored to read: * 7 * * A *. The first character could be a B or an 8. The third and fourth characters could not be restored. The sixth character could have been a 9.
JAUEQF	Attempts to restore the obliterated serial number of Item 1 were partially successful. The partially restored serial number is *7JNA9 with the asterisk representing either a 'B' or an '8' character.
JBA322	Examination of the submitted steel bar stock (Item 1) found the manufacturer's serial number to have been obliterated. Physical and chemical processing of the submitted steel bar stock (Item 1) partially restored the obliterated, original serial number to read "87J??9". The question marks (?) represent unrestorable characters.
JFLJKJ	The serial number was restored to read B7JNA9.
JP8MRJ	Serial Number Restoration Analysis: Methodology: Physical (Visual Examination), Microscopy (Comparison Microscope), Magnetic Particle Inspection. Serial number restoration procedures revealed the serial number on Item 1, the piece of stainless steel bar stock, to be: B 7 J N A 9
JTRGMX	The serial number is milled off. The serial number B7JNA9 was restored by acid etching. Polishing, Magnflux, Fry's reagent and Nitric Acid were used for the restoration. The magnetic particles provided some outline of the serial number; however, the digits were not clear therefore, polishing and acid etching were necessary. A chemical reaction was observed when the acid etching solution was applied to the surface area of the firearm. This Item will be held in the Firearm Section's Evidence Room.
JZLLFY	The serial number of Item 1 as restored is B7J1A9.
K39MW8	Using chemical etching techniques, the serial number was partially restored to read 87J?A9. The forth character could not be determined.

TABLE 2

WebCode	Conclusions
KEPA8T	Attempts to restore the obliterated serial number of the above firearm using magnetic and chemical methods were partially successful. The serial number is either B7JHA9 or B7JNA9.
KKAK3A	Visual examination and chemical treatment of the serial number area on the bar stock, Item 1A, reveal the following partially restored number: _ 7J_A_
KVA28T	The serial number is obliterated. Chemical and magnetic particle inspection techniques were unsuccessful. No characters were restored.
KWMUK8	Examination and chemical processing restored the obliterated serial number, which was determined to be "B7JNA9".
KY9C3T	The obliterated surface on the steel bar stock (Item 1) was sanded and chemically processed. The difficulty of the test this year was quite higher than the test last year. Only two of the six characters we could restore in a clearness that we could be sure which character it is. The other four characters we only could restore more or less clear but with an uncertainty of at least one other character.
L2YVPC	Item 1-1 A piece of 303 stainless steel bar stock with suspected obliterated serial number.: Visual examination of this item revealed the presence of grind marks on one side of the bar stock. This area was magnetically processed and etched with acid solutions, and the following was restored: B 7 * * A 9 The * represent characters which could not be identified.
L68KK6	The item was received with the serial number obliterated. The number was restored by polishing the area with a Dremel tool and by acid etching. The serial number was restored to read "27J4A9"
L9T33P	[No Conclusions Reported.]
LB436C	As a result of an attempted obliterated number restoration the following characters were observed: B735A0
LBWXL T	An attempt was made to restore the characters on the item 1 metal plate. The following characters were restored: B or 8 7 J N A 9. The aluminum standard was used for reference only.
LFRRJU	Using serial number restoration techniques, the following characters were restored on Item #1: * 7 J * A 9. The first character appears to be an "8", but the possibility of a "B" could not be ruled out. The fourth character is either "N" or "H".
LJRZM4	An attempt at recovering an erased serial number was performed. The following partial alpha-numerical code was recovered 87 - - A9. However the missing code is likely to be 3 and 5 resulting in the code being 8735A9.
LJTNBA	The obliterated serial number on the Item 1 bar stock was successfully restored to read B7JNA9.
LLH3TR	Conclusions: The submitted bar stock was received with an obliterated serial number located within the lower portion of the bar stock plate. Attempts to restore the serial number were partially successful by means of polishing, magnetic particle, and chemical etching methods. The serial number was partially restored to read "B7J?A9.
LMTY7A	The serial number was partially restored, revealing six characters that read: 87J*A9 (* representing a H, N or K).
LWF37W	The partial serial number *7J?A9 was restored, where the "*" is most consistent with a "B" or an "8" and the "?" is too indistinct to make any determination.
MJRB38	1. Examination of Exhibit 1 revealed one ferromagnetic metal bar measuring 67.13 mm long, 25.44 mm wide and 6.39 mm thick. At the center of the metal bar, there is an obliterated area measuring 24.44 mm long, 24.73 mm wide and 5.63 mm thick. 2. Examination and standard serial number restoration techniques were conducted on the obliterated area of Exhibit 1 revealing: a. The characters on Exhibit 1 could not be fully restored; however, the following characters were observed: * 7 J N ^ 9. The asterisk (*) represents the possibility of an 8 or a B; the caret symbol (^) represents the possibility of a 4 or an A. 3. All measurements are approximate.
MLD4V2	The serial number on Item SNR1 was restored to B 7 J H A 9.

TABLE 2

WebCode	Conclusions
MPCHHR	The examination of the submitted sample of a metal piece with a removed six-digit stamped serial number was carried out by etching procedures using the acid solutions "Oberhoffer", "Meyer-Eichholz", "Wazau" and "Fyr". By this process the number/letter combination "B7JHA9" could be made visible.
N2M8WM	The stainless steel bar which was submitted to our examination has been milled, thus obliterating the serial number. We used an acid etching technique to restore this number, which reads as follows : F25B9D
N4DEEY	The serial number, located on a stainless steel bar stock, appeared to have been deliberately obliterated through milling. I used methods of polishing, magnetic particle inspection and chemical etching techniques to partially restore the serial number to B7J?A9, where "? " is either an N or H.
N4NF2X	The serial number on the metal bar, Exhibit 1, was determined to be B 7 J _ A 9. The fourth character is either an N, H or K.
N72QE4	The restoration techniques applied allowed to identify the previously obliterated serial number "B 7 J H A 9".
NBB4V3	On the examination, I found that there were filing mark on the stainless steel bar stock and no numbers were observed. On electrochemical treatment, a set of number read as "B7JNA9" was restored. Hence, I am of the opinion that the numbers of the stainless steel bar stock were tempered and the original numbers were "B7JNA9".
NDXLDN	The serial number on the metal plate (Exhibit 01) was mechanically and chemically treated and partially restored to read B7J*A9. The asterisk represents characters that could not be restored. The metal plate (Exhibit 02) was documented and photographed; however, no further analysis was performed.
NMP2Z7	I attempted to restore the serial number using chemical etching and magnetic particle inspection and obtained the following characters: B 7 (3 or J) 5 A 9. I could not distinguish if the third character of the serial number was the number 3 or the letter J.
NRHQGX	Physical and chemical processing of the bar stock partially restored the obliterated, original serial number to read "?7J?A9". The question marks represent unrestored characters.
NTXHH8	The serial number on Item 1 was partially restored using chemical etching techniques and found to be ? 7 ? ? A 9. The first character appears to be an 8 or a B. The third and fourth characters could not be restored.
NVU9F7	Through the examination (chemical and microscopic restoration process), carried out, the determination was: 1. The serial number on the 303 stainless steel bar stock, described in Item 1, was not restored due to its high degree of mutilation.
P24NPU	The serial number wa fully restored to B7N1A9.
P2H9H6	Visual examination and chemical treatment of the serial number area on the barstock, Item 1A, reveal the following partially restored number: B 7 _ _ A 9. Item 1B was submitted as a reference standard for comparison to Item 1A. No analysis was performed on Item 1B.
P7UXYT	Examination and processing of the Q-1 bar stock resulted in a partially restored serial number which was determined to be "87J*A9". The "*" represents a character that is possibly an "H", "K" or "N"; however, the identity of this particular character could not be confirmed. The following methodologies were used in the examination of this case: Visual Examination, Physical Examination, Physical Processing, Magnetic Processing, Chemical Processing.
P9MRWW	1-Item No 1 is metal piece with the following dimensions: length= 66.8mm, width= 25.5mm and height= 6.4mm. Visual examination of the evidence shows the existence of a scratch on one side of the part, caused by milling. The size of scratched zone is approximatively: length= 25.7mm, width= 25.5mm and depth= 0.8mm. 2-The chemical restoration of the characters that had been altered by milling was positive and the result is B 7 J H A 9. 3-The restored character in position 1 is either B or H with a higher probability for the character B. 4-The restored character in position 4 is either H or N with a higher probability for the character H.

TABLE 2

WebCode	Conclusions
PAUAVT	Chemical restoration revealed the serial number to be: 87J?A9. The "?" character could not be fully restored. It could be H,K or N.
PFZ3PN	A serial number restoration was attempted on Item 1 using chemical etching techniques. The serial number was partially restored to read ? 7 J ? A 9 where the first character appears to be an "8" and the fourth character could be either an "H" or an "N".
PNEPYR	Item 1 was chemically processed in regards to a defaced serial number and was partially restored to: "(8,B)7JKA9". The beginning character could not be fully restored and is believed to be an "8" or "B".
PQL8WN	The obliterated serial number on the stainless steel bar stock in Item #1 was partially restored and found to be * 7 J * A 9 (The first * could be a B or an 8 and the second * could be an H, K, or N).
PRC7BL	Restoration of obliterated serial numbers have been done using chemical etching. The following characters have been restored : B7JKA9 the identification of K character is uncertain.
PXHL6	Visual examination and chemical treatment of the serial number area on the metal bar, Item 1A, reveal the following partially restored number: B7 __ A9.
Q4JFD3	A Physical/chemical serial number restoration procedure was conducted on item #1 with the following results: The defaced serial number on item #1 was restored to read 870HA9
Q4ZRUM	The analysis of the evidence was initiated on February 17th, 2021. The stainless steel bar stock was visually examined. Attempts to restore the serial number using a dremel tool, magnetic methods, and chemical processing were partially successful. The partially restored serial number is B7J*A9. * = could be H, K, or N
QL3CUV	The obliterated number on Item 1 was polished and chemically restored to reveal a partial serial number of (B7 __ A9). The third character could be (a J, U, O). The fourth character could be (a H or N).
QQW7RW	IN MY OPINION THE ORIGINAL NUMBER / CHARACTERS WERE AS FOLLOWS: (8/B/0) 7 (J/3) (N/H/M) A 9. IN MY OPINION INSUFFICIENT RESIDUAL STRESS REMAINED IN THE SAMPLE FOR A MORE DEFINITIVE ASSESSMENT. OPTIONS IN BRACKETS.
QXYFXP	Results/Conclusions: Exhibit 1 was processed with serial number restoration techniques and the following was developed in the obliterated section: "B7JNA9".
QZ3BGT	Standard laboratory procedures for restoring characters stamped in metal have been employed on the obliterated area. This area was only partially restored. The restored characters were "B7J*A9". "*" = K, N, or H
R2EAC2	The stainless steel bar stock (Item 1 / Test No.21-525) presented wear in a part of its surface. When applying the development process, the alphanumeric sequence "87JNA9" was restored.
R4JQT7	Item 1-1 Trace item - A piece of 303 stainless steel bar stock with suspected obliterated serial number: Visual examination of this item revealed the presence of grind marks on one side. This area was etched with acid solutions, and the following was restored: B 7 J (N) A 9 () indicates a possible character due to an incomplete restoration.
R7BP84	1. Examination of Exhibit 1 revealed a metal bar with an obliterated area in the approximate center. No characters could be restored using standard restoration techniques.
R7NМУZ	I examined and chemically processed Item 1, and I determined the serial number to be B70NA9.
R8LQT3	1. The obliterated area on the Exhibit 1 metal block was processed using magnetic particle reagent and chemical etching. The characters were not restored.
RH2MQT	[No Conclusions Reported.]
RJA3WZ	The characters were removed from the sample approximately 0.1 mm thickness. The removed serial number was resulted by the examination B7JNA9.

TABLE 2

WebCode	Conclusions
RKPYPY	The examination and chemical processing of the obliterated serial number using restoration solutions #1, #2 and #3 restored the original obliterated serial number which was determined to be B7JHA9. The procedure was photographed and documented accordingly.
T34XAM	Item 1 was physically and microscopically examined. The serial number area of Item 1 was prepared and treated with chemical reagents. As a result of these actions, no legible characters were developed.
TKK3UU	The serial number appeared to have been deliberately obliterated through milling. I used magnetic particle inspection, polishing, and chemical etching techniques to restore the serial number to B7J1A9.
TM9DTY	A serial number restoration was attempted on Exhibit D using chemical etching techniques. The serial number was partially restored to read 8 7 ? ? A 9.
TWDNZP	The item #1 aluminum bar stock was physically and chemically processed. Its serial number was partially restored to read: ?7JNA9. Possible missing letter/number could be a B or 8.
TZFLBH	ONE (1) PIECE OF STAINLESS STEEL (APPROX. 2 5/8" x 1" x 1/4") SUBMITTED WITH A SUSPECTED OBLITERATED SERIAL NUMBER. A ONE INCH SQUARE AREA OF SURFACE REMOVED BY A DRILLED/CUTTING DEVICE. PARTIAL SERIAL NUMBER "B7J?A9" RESTORED USING CHEMICAL ETCHING PROCESS, FOURTH DIGIT POSSIBLE "H or N". SCRIBED WITH CASE NUMBER "21-5250D" BY EXAMINER.
UAH4JY	The restoration of the area presenting alteration was done and it was possible to achieved the complete restoration where the alphanumeric sequence B7JNA9 was observed.
UH9PPX	I found filing marks on the metal plate 'Item 1'. Upon electrochemical treatment on the filed surface, the number 'B7JNA9' was restored. Therefore, I am of the opinion that the obliterated serial number is 'B7JNA9'.
UM74CM	The serial number of Item 001 was mechanically and chemically processed and partially restored to read "?7J5??". This is also the opinion of Firearms Examiner _____. Each question mark represents a serial number character that could not be restored.
UQ3UHY	The obliterated area on the piece of 303 stainless steel bar stock in item 1 was chemically etched and the serial number was determined to be B7J?A9. The questioned digit could be the numbers 1 or 5 or the letter N.
UU6TTQ	The above number was abliterated throught mechanically abliterated of metal surface from serial number field. In the fourth position there is a fragmentary sign of the content: H or N.
UWT6RW	Serial number restoration revealed the number B7JNA9.
V6J6LF	The restoration revealed the following characters: B 7 J 5 A 9.
VFG6YJ	I found filing marks on the metal plate 'Item 1'. Upon electrochemical treatment on the filed surface, the number 'B7JNA9' was restored. Therefore, I am of the opinion that obliterated serial number is B7JNA9.
VLTTYF	Unable to recover serial number.
VZTQ4Z	1. Examination of Exhibit 1 disclosed it to be a piece of a 303 stainless steel bar stock displaying an area of obliteration in its center. The obliterated area of Exhibit 1 was visually examined, sanded, polished, and chemically processed. Within this area characters were partially restored and the following was observed: * 7 J # A 9 where * can be either an 8 or b, and # can be either an H, N, or 1.
W2XM4U	Serial number restoration revealed the number B 7 J N A 9.
WAAYWL	The obliterated serial number characters on Item 1 stainless steel bar stock were restored and interpreted as either B7JNA9 or 87JNA9.
WHPK7P	The obliterated number on Item 1 was polished and chemically restored to reveal a partial serial number of (B7__A9). The third character could be a U, J or O, and the forth character could be an H or a N.

TABLE 2

WebCode	Conclusions
WKTFPT	The serial number was received sanded off the piece of metal. A physical and visual examination was conducted utilizing sanding, polishing and chemicals, Frys, Davis, Turner and Nitric Acid. An attempt to restore the serial number was made. The fourth character could be an "N". The fifth character appears to be an "8" but could potentially be a "O". A full restoration could not be completed at this time. Photographs were taken throughout the restoration process.
WYAB6P	Upon electrochemical treatment on the filed surface, the number B 7 J N A 9 was restored. Based on my findings, I am opinion that B 7 J N A 9 was the original number stamped on the surface that was previously obliterated
X3N9AQ	The examination and processing of the obliterated serial number on the Item 1 bar stock was restored to read "B7J*A9". The asterisk represents a letter that was partially restored and is most likely an "N" or an "H".
X42T32	Attempts were made to recover the obliterated serial number on the stainless steel bar stock (Item 1) utilizing physical and chemical analysis of the serialized metallic surface area. The serial number could not be recovered due to the deep grinding/milling that occurred on the serialized surface.
X4Z6FV	The piece of metal identified internally in the Ballistics Unit as E1-21-0530 (Item 1), showed wear and / or alteration on one of its sides, so the development process is carried out on the area worn, obtaining the alphanumeric sequence: "87JNA9".
X6Q4UU	Based on the above examination, I am of the opinion that the original serial number on the piece of stainless steel bar stock 'Item 1' is B7JNA9.
XEYTF6	The serial number was determined to read: 5 7 3 H or N A 9
XPKUXZ	The serial number is milled off. The serial number (B7JNA9) was restored by acid etching. Polishing, Fry's reagent and Nickles & Alloys reagents were used for the restoration. A chemical reaction was used observed when the acid etching solution was applied to the surface. Disposition: This item will be held in the Firearm Section's Evidence Room.
XTGNMN	The Serial No. (B7??A?) was recovered using the chemical etching process.
XV8MAZ	The area was magnetically and chemically processed and the serial number was partially restored to read: B7J*A9, where the * is likely an "H" but could be an "N".
XVM7UW	1. Exhibit 1 consists of one ferromagnetic bar with an obliterated area. 2. The obliterated area on Exhibit 1 was partially restored and the following characters were observed: * 7 J ? A 9, where * can be either a 8 or B and ? is an unrestored character.
XW2FYQ	[No Conclusions Reported.]
XXBHT3	Number restoration techniques revealed a line of six characters in this central area. These were "? 7 ? ? ? 9"; where the first "?" was either a "B" or an "8"; the second "?" appeared to be a "J"; the third "?" was too unclear to be interpreted; and the fourth "?" could have been either a "O", a "4", an "A" or a "D".
Y4WV8V	Visual examination and chemical treatment of the serial number area on the bar stock, Item 1, reveal the following number: B 7 C 1 A 9.
Y7NQU4	The milled area in the center of the block was processed using mechanical, physical, and chemical techniques. The six-character stamped mark was mostly restored and appears to be: B 7 J H A 9. Generally, the restored characters were not totally clear. The fourth character looked like it could also be an N.
Y8VARZ	The serial number on Item 1 was partially restored to read B7J?A9. The question mark represents an unrestored character of the serial number. Based on the restored portions of the character and the provided serial number structure guide, the unrestored character is likely an H, K, or N.

TABLE 2

WebCode	Conclusions
Y99KNJ	The bar stock piece was examined. The center of this bar stock had an obliterated area with a suspected serial number. Using standard chemical restoration techniques, an attempt to restore the serial number was made. The serial number was partially restored and was determined to be B7J*A9, where * represents either a H or a N.
YCBGFY	Exhibit 1 was physically examined and there is an area of obliteration located on the middle of the bar stock. This area was chemically and magnetically processed and the following characters were restored "B7JNA9".
YG4QHK	Serial number restoration techniques were applied to the submitted metal bar stock (Item 1). The serial number was determined to be B73HA9.
YNZHQE	A serial number restoration was attempted using chemical etching techniques. The serial number was partially restored to read B7??A9, with the third character possibly a J.
Z2N4AE	Serial Number was successfully recovered : B7JMA9
Z4CF9K	The metal bar, item 1, was examined and determined to be non-ferrous metal with approximately .035" metal milled out as the obliterated area. The obliterated area was polished, treated with chemicals and compared to the supplied standard characters. The serial number was restored to be B 7 * # A 9. The third and fourth characters could not be completely resolved due to the depth of obliteration. The third character (denoted by *) could have been J or O and the fourth character (denoted by #) could have been N or H.
Z6MDL3	The serial number that was restored is interpreted to B78NA9. The initial three characters is a bit uncertain and the B could be an 0 or 8, the 7 could be a 2 and the 8 which is the most uncertain character could be an 6 or B.
ZDGQFA	Serial number "B7J?A9 partially restored by chemical etching process. Questioned character possible "H".
ZKZUMC	The defaced serial number of Item 1 was physically, magnetically and chemically processed to read: "B 7 J N A 9".
ZMN6LH	Item 1 is a piece of 303 stainless steel bar stock submitted with suspected serial number obliterated. The serial number was partially restored to read: B7J?A? using the chemical etching method. The characters represented by the '?' were not restorable and can be any alpha or numeric characters.

Sample Preparation

(listed in order of use)

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
247GU3	Sanding	Emery paper	ultrafine
287WXJ	Visual	Microscope	
	Cleaning	Acetone	
	Polishing	Dremel	60 and 120
29YTKR	Sanding	Sand paper	80, 220, 400, 1000.
	Cleaning	Acetone	
2B6BL9	Visual	Stereoscope	
	Polishing	Rotary Tool	unknown
	Polishing	Flitz metal polish	
2DTMKE	Visual	Stereoscope	
	Cleaning	Isopropyl Alcohol	
	Sanding	Sand paper	120, 220, 320, 600, 1200
	Polishing	Steel wool	
2EPZ6L	Sanding	Emery paper	120, 180, 240, 400 GRIT WET AND DRY PAPER BY HAND
2GDC6R	Visual	Stereoscope	
	Grinding	Dremel	
2KXEVX	Polishing	Dremel	
2LBV9B	Polishing	Dremel	
2MJ9QD	Polishing	Dremel	
	Polishing	Steel wool	
2P8KPH	Polishing	Dremel	
2RD3NE	Visual	magnet	
	Sanding	Sand paper	400
2RW4C2	Sanding	Rotary Tool	Unknown grit sanding band
	Sanding	Sand paper	180, 1200 & 2000
2UGX8G	Polishing	Emery paper	240

TABLE 3

Sample Preparation			
<u>WebCode</u>	<u>Method</u>	<u>Tool Used</u>	<u>Grit Size</u>
2X3MRU	Visual	Stereoscope	
	Sanding		500
2Z96PP	Cleaning	Acetone	
	Sanding	Sand paper	320
3B3VUU	Visual		
	Polishing	Dremel	425 wheel
3DQ8TZ	Polishing	Dremel	
	Visual	Stereoscope	
3L7VLF	Visual	Stereoscope	
	Grinding	Dremel	
	Sanding	Sand paper	medium and super fine
3MXUZE	Sanding	Sand paper	150, 220 grit
	Polishing	Sand paper	400, 600 grit
	Polishing	Dremel	polishing wheel with red polishing compound
3RTL9B	Sanding	Sand paper	1500
	Polishing	Dremel	
3W7GUZ	Polishing	Dremel	Done after Magnaflux
3XHFQU	Polishing	Rotary Tool	
42WDWW	Sanding	Sand paper	220, 400, 600,
	Polishing	Sand paper	1200
44G8PQ	Cleaning	Acetone	
	Sanding	Sand paper	P 400
47A4DK	Visual	Stereoscope	
	Polishing	semichrome	
	Grinding		
	Sanding	Rotary Tool	320
	Cleaning		
	None		

TABLE 3

Sample Preparation				
WebCode	Method	Tool Used	Grit Size	
4AJGVJ	Visual			
	Visual	Microscope		
	Cleaning	Acetone		
4FDDKA	Polishing	Dremel		
	Sanding	Sand paper	320 / Emory	
4H2PJF	Polishing	Dremel		
4MWGRC	Polishing	Dremel		
4P3W8V	Polishing	Dremel		
	Sanding	Sand paper	500	
4YP3X8	Polishing	Dremel		
62BY7X	Sanding	Sand paper	150	
	Polishing	Steel wool		
	Polishing	Dremel	Rubber Cratex Tip	
636ULF	Visual	Stereoscope		
	Polishing	Dremel	Fine	
64DXGQ	None			
673BYA	Polishing	Dremel		
	Polishing	Steel wool		
67LCNW	Visual	Visual		
	Visual	Microscope		
6C83AR	Visual	Stereoscope		
	Polishing	Rotary Tool		
6CQV3P	Visual			
	Sanding		600	
	Cleaning	Acetone		
6F8E7R	Polishing	Dremel		
6GKTRF	Visual			
	Polishing	Dremel		
	Sanding	Emery paper	Fine	
	Sanding	Sand paper	320	

TABLE 3

Sample Preparation				
WebCode	Method	Tool Used	Grit Size	
6HWRNA	Sanding	Sand paper	120, 360, 600, 800, 1000, 1500	
6KK4MF	Sanding	Dremel	600	
	Polishing	Dremel		
6V3KFM	Cleaning	Acetone		
6YMM7T	Polishing	Steel wool		
	Polishing	Dremel		
762XQ8	Visual	Stereoscope		
	Polishing	Dremel		
79Z9M8	Visual	Stereoscope		
7AH3MG	Visual	Stereoscope		
	Polishing	Dremel		
7BBYAP	Visual	Magnifying Glass and Microscope	N/A	
	Cleaning	Acetone	N/A	
	Sanding	Sand paper	220	
	Polishing	Sand paper	500	
	Cleaning	Delicate Task Wipe	N/A	
7CPKLC	Grinding	Rotary Tool		
7ERJW6	Polishing	Dremel		
	Cleaning	Acetone		
8DAPUA	Visual	Stereoscope		
	Polishing	Dremel		
8K2UVQ	Visual	Stereoscope		
	Polishing	Steel wool		
	Sanding	Sand paper	240	
8MZAZ9	Polishing	Steel wool	120	
	Cleaning	Acetone		
8PNLYD	Cleaning	Acetone		
	Polishing	Dremel		
8TCNYE	Sanding	Dremel		

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
8UYZGC	Visual	Microscope	
8ZQ8YK	Polishing	Dremel	
	Sanding	Sand paper	600
92YJGM	Visual	Magnifying Glass	N/A
	Cleaning	Acetone	N/A
	Polishing	Sand paper	100, 220 and 500
96CJDD	None		
99ZVCJ	Sanding	Dremel	220-240?
	Polishing	Steel wool	
9B3TMC	None		
9D9A3V	Visual	Microscope	
	Polishing	Emery paper	various sizes from coarse to fine
	Polishing	buffing wheel	cloth
9E6RY6	Visual	Stereoscope	
	Polishing	Dremel	
9GT4XA	Polishing	Dremel	
9JETHM	Sanding	Sand paper	220
9LNXVB	Polishing	Dremel	
	Sanding	Steel wool	0000
9LZUZF	Visual	Stereoscope	
	Grinding	Dremel	
	Sanding	Sand paper	160
	Polishing	Steel wool	
	Cleaning	Acetone	
9NN7YL	Visual	Microscope	
9RBNG7	Visual		
	Polishing	Rotary Tool	

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
9UG7F3	Visual	Stereoscope	
	Sanding	Dremel	120, 240
	Sanding	Sand paper	800, 1000, 1500, 2000, 2500
	Polishing	Sand paper	2000, 2500 w/ WD-40
9WK2Y6	Visual		
	Cleaning	Magnaflux cleaner	
9XYHZP	Polishing	Dremel	
9Y9DYB	Visual	Stereoscope	
	Cleaning	Acetone	
	Polishing	Dremel	
A6RZ7L	Sanding	Sand paper	80, 220, 1000
ABJAFJ	Sanding	Sand paper	80, 220, 400 and 1000
ACV292	Polishing	Dremel	
AFD4DK	Visual	Microscope	
	Cleaning	Acetone	
AMEJ28	Sanding	Sand paper	Fine Grit
	Polishing	Buffing Wheel	
AMTZ3R	Polishing	File	fine
	Polishing	Emery paper	Fine crocus paper
AN8CYC	Polishing	Dremel	Fine (red) and extra fine (lt. green)
APY9LK	Sanding	Sand paper	180, 220,360,400
AQRCXR	Visual	Stereoscope	
	Polishing	Dremel	
ATJACQ	Sanding	Dremel	~P80
	Sanding	Power sander	P180
	Sanding	Sand paper	P220, P400, P600, P1200
	Polishing	Dremel	
ATYJGK	Polishing	Stereoscope	1000

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
AUD6T8	Visual	Stereoscope	
	Polishing	File and steel wool	
	Sanding	Emery paper	unknown
B4UC3G	Visual	Fluorescent Lamp	
	Polishing	Rotary Tool	
BAKLDE	Visual	Microscope	prior to surface prep
	None	Magnaflux	prior to surface prep
	Sanding	Sand paper	various (120, 150, 220, 400, & 800)
BVZ4KB	Sanding	Sand paper	P240 & P600
BY32TH	Polishing	Dremel	none
C4DEBG	Sanding	Sand paper	80, 220, 1000
C6HZZ3	Polishing	Dremel	
	Cleaning	Acetone	
C7F9DR	Polishing	Emery paper	240, 800, 1200
	Grinding	Filing	Fine metal file
	Cleaning	Ethanol	
CC7MV8	Sanding	Sand paper	600
	Polishing	Dremel	buffing wheel
CE9L7Z	None		
CJL7F8	Polishing	Dremel	
	Polishing	Steel wool	
CKZTP9	Visual	Stereoscope	
	Sanding	Sand paper	320
	Polishing	Sand paper	660
	Cleaning	Acetone	
CZAJRD	Visual	lighting	
	Sanding		150 grit/ 220 grit/400 grit
	Polishing	Dremel	
D92E43	Visual		
DACCHK	Polishing	Rotary Tool	cloth wheel only

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
DCZNGP	Polishing	Rotary Tool	
DJG9GG	Polishing	Dremel	
DKHW6L	Sanding	Dremel	400
DTN2VH	Visual	Stereoscope	
	Polishing	Dremel	
DU3DPF	Sanding	Sand paper	80, 220, 1000
E3RKMC	Sanding		
E3T9AG	Visual	Stereoscope	
	Cleaning	Kimwipe	
	Sanding	Sand paper	P100
E6HMTZ	Visual		
	Polishing	Dremel	
E6UJX6	Visual	Stereoscope	
	Visual	MAGNETIC YOKE	
	Polishing	Dremel	120
EAC4Z8	Polishing	Dremel	
EDR9E9	Visual		
	Sanding	Dremel	Fine-medium grit
	Polishing	Sand paper	Fine
EEMU8Z	None		
EKDYAG	Polishing	Dremel	
EMYQC7	Polishing	Sand paper	1500
EP69B3	None		
ER97JA	Sanding	Dremel	Fine
EV8HFA	Polishing	Dremel	
F9CZQA	Sanding	Dremel	120
	Sanding	Sand paper	150
	Sanding	Sand paper	320

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
F9FH XK	Sanding	Sand paper	400 and 1200
	Polishing	Rotary Tool	
	Cleaning	Acetone	
FBHDGN	Visual	Sand paper	1200
	Sanding		600
FBZCPE	Cleaning	Acetone	
FEE87C	Polishing	Dremel	also slight sanding grit 500
FH2NNW	Polishing	Dremel	
	Grinding	Rotary Tool	
FL4HNM	Visual		
	Grinding	Dremel	
	Sanding	Sand paper	400
FNPCJ3	Polishing	Dremel	
FWFWMF	Sanding	Sand paper	150
	Polishing	Sand paper	400
FYPYBY	Visual	Stereoscope	
	Polishing	Dremel	Polishing attachment
G766KB	Polishing	Dremel	N/A
G7LCRE	Polishing	Sand paper	600
GEZX2H	Sanding	Sand paper	320/500
GKK3PC	Sanding	Sand paper	1000
GMM2Z6	Visual		
	Sanding	Dremel	80
	Polishing	Dremel	
GUQ8F8	Visual	Stereoscope	
	Polishing	Dremel	
	Sanding	Sand paper	400
GV4GTE	Polishing	Sand paper	400 and 1000
GVG7U7	Sanding	Dremel	150, 600

TABLE 3

Sample Preparation			
<u>WebCode</u>	<u>Method</u>	<u>Tool Used</u>	<u>Grit Size</u>
GVKT9Y	Polishing	Steel wool	
	Sanding	Sand paper	600 and 320
GZZ2WX	Polishing	Dremel	#240
H23J9Y	Polishing	Rotary Tool	
H2MYN2	Visual		
	Polishing	Dremel	
H8TTHX	Polishing	Dremel	
	Polishing	Emery paper	grit 1
HAKPDH	Visual	Microscope	
	Sanding	Sand paper	Between 600 and 1200 grade
HBVPAD	Polishing	Dremel	N/A
HDGH38	Visual	Stereoscope	
	Sanding	Sand paper	240, 400, and 600
HDJ29H	Sanding	Sand paper	400 , 800 , 1200
	Polishing	Brasso, cloth	
	Cleaning	Acetone	
HK49N3	Polishing	Dremel	
HMAMEG	Grinding	Dremel	
HPAYR9	Cleaning	Acetone	
	Polishing	Dremel	
HVD77B	Cleaning	Acetone	
	Polishing	Rotary Tool	
	Cleaning	Acetone	
HWT6QZ	Polishing	Dremel	
J3DKUX	None		
J7DWPX	Sanding	Sand paper	P400
JAUEQF	Polishing	Dremel	

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
JBA322	Visual	Stereoscope	
	Grinding	Dremel	
	Polishing	Rotary Tool	
JFLJKJ	Polishing	Dremel	
JP8MRJ	None		
JTRGMX	Visual		
	Sanding		120 Grit
	Polishing	Rotary Tool	
JZLLFY	Visual	Stereoscope	
	Sanding	Sand paper	220 and 400
	Grinding	Dremel	
K39MW8	Visual		
	Visual	Microscope	
	Polishing	Dremel	
KEPA8T	Polishing	Dremel	
KKAK3A	Polishing	Dremel	
	Sanding	Sand paper	800
KVA28T	Polishing	Rotary Tool	
KWMUK8	Polishing	Dremel	
KY9C3T	Sanding	Sand paper	P 400
L2YVPC	None	Stereoscope	
L68KK6	Polishing	Dremel	N/A
L9T33P	Polishing	Sand paper	600
LB436C	Polishing	Dremel	
LBWXL	None		
LFRRJU	Polishing	Rotary Tool	
LJRZM4	Polishing	Sand paper	fine grade
LJTNBA	Polishing	Dremel	

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
LLH3TR	Visual	Stereoscope	
	Polishing	Rotary Tool	
	None		
LMTY7A	Polishing	Dremel	
LWF37W	Polishing	Dremel	
MJRB38	Cleaning	Acetone	
	Visual	Stereoscope	
	Grinding	Sand paper	400 grits
	None		
MLD4V2	Polishing	Dremel	
MPCHHR	Visual	Stereoscope	
	Grinding	File	
	Sanding	Sand paper	100 and 400 + Oil
N2M8WM	Sanding	Rotary Tool	500
N4DEEY	Grinding	Rotary Tool	
N4NF2X	Visual	Stereoscope	
	Sanding	Sand paper	various
	Polishing	Dremel	
	Cleaning	Acetone	
N72QE4	Cleaning	Acetone	
	Polishing	Steel wool	
NBB4V3	Visual	Physical Observation	
	Cleaning	Acetone	
NDXLDN	Polishing	Dremel	
	Visual		
	Cleaning	water	
NMP2Z7	Visual	Stereoscope	
	Cleaning	Acetone	
	Sanding	Sand paper	240, 600
	Grinding	Dremel	
	Polishing	Sand paper	1500

TABLE 3

Sample Preparation				
WebCode	Method	Tool Used	Grit Size	
NRHQGX	Sanding	Sand paper	fine	
	Sanding	Rotary Tool	fine	
NTXHH8	Visual	Stereoscope		
	Polishing	Dremel		
NVU9F7	Visual	Stereoscope		
	Cleaning	Acetone		
	Sanding	Sand paper	500	
	Cleaning	Acetone		
P24NPU	Visual	Stereoscope		
	Polishing	Dremel		
P2H9H6	Grinding	Dremel		
	Polishing	Dremel		
	Sanding	Sand Paper	220	
P7UXYT	Visual			
	Polishing	Dremel		
P9MRWW	Cleaning	Acetone		
PAUAVT	Sanding	Sand paper	200 & 600	
PFZ3PN	Sanding	Sand paper	P80, P320	
	Polishing	Steel wool		
	Visual	Stereoscope		
PNEPYR	Visual	Stereoscope		
	Polishing	Dremel		
	Polishing	Rotary Tool		
PQL8WN	None			
PRC7BL	Polishing	Emery paper	N° 600	
PXHXL6	Sanding	Sand paper	220	
	Polishing	Dremel		
Q4JFD3	Polishing	Dremel	Coarse to Extra Fine	
Q4ZRUM	Polishing	Dremel		
QL3CUV	None	Dremel	Polish	

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
QQW7RW	Sanding	Sand paper	400, 600, 1200
QXYFXP	Polishing	Dremel	
QZ3BGT	Visual	Microscope	
	Polishing	Dremel	
R2EAC2	None	Sand paper	#80, A400, 220, 1000
R4JQT7	Visual	Stereoscope	
R7BP84	Polishing	Dremel	sanding attachment
	Sanding	Sand paper	220, 400
	Polishing	Dremel	polishing pad & compound
R7NMUZ	Polishing	Dremel	
R8LQT3	Polishing	Dremel	
RH2MQT	Sanding	Sand paper	4000-5000
RJA3WZ	Cleaning	Acetone	
	Polishing	Sand paper	300
	Polishing	fiberglass sander	
RKPYPY	Sanding	Emery paper	150
	Sanding	Sand paper	1500
	Polishing	Dremel	
T34XAM	Visual	Stereoscope	
	Sanding	Sand paper	300
	Sanding	Sand paper	400
	Polishing	Steel wool	
	Polishing	Dremel	
TKK3UU	Visual	Stereoscope	
TM9DTY	Visual	Stereoscope	
	Grinding	Dremel	
TWDNZP	Polishing	Dremel	
	Cleaning	Acetone	
TZFLBH	Polishing	Dremel	N/A
UAH4JY	Sanding	Sand paper	400, 220 and 80

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
UH9PPX	Cleaning	Acetone	
UM74CM	Grinding	filing	
UQ3UHY	Visual	Stereoscope	
	Polishing	Dremel	425 wheel
UU6TTQ	Grinding	Dremel	
	Polishing	Dremel	
UWT6RW	Grinding	brush wheel	
V6J6LF	Visual	Stereoscope	
	Polishing	Dremel	120
	Polishing	Sand paper	800, 1000, 1500, 2000
VFG6YJ	Cleaning	Acetone	
VLTTYF	Polishing	Dremel	
VZTQ4Z	Polishing	Dremel	
	Sanding	Dremel	
W2XM4U	Polishing	Dremel	
WAAYWL	Visual	Stereoscope	
	Grinding	Rotary Tool	medium/fine
	Polishing	Rotary Tool	
WHPK7P	Polishing	Dremel	n/a
WKTFTP	Visual	Microscope	
	Sanding	Dremel	408
WYAB6P	Cleaning	Acetone	
X3N9AQ	Visual		
	Polishing	Rotary Tool	200/400
	Grinding		
	Sanding		
	Cleaning		
	None		
X42T32	Polishing	Emery paper	600
	Polishing	Dremel	425

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
X4Z6FV	Sanding	Sand paper	220,400
	Polishing	Sand paper	1000
X6Q4UU	None		
XEYTF6	Grinding	Dremel	
	Sanding	Sand paper	220 and 600
XPKUXZ	Polishing	Rotary Tool	
XTGNMN	Cleaning	Acetone	
XV8MAZ	Polishing	Dremel	
XVM7UW	None		
XW2FYQ	None		
XXBHT3	Sanding	Sand paper	120 to 1200
Y4WV8V	Visual	Microscope	
	Visual	visual	
	Sanding	Sand paper	120
	Polishing	Dremel	
Y7NQU4	Sanding	Sand paper	150
	Polishing	Dremel	Ex-fine Cratex
Y8VARZ	Polishing	Dremel	
Y99KNJ	Sanding	Sand paper	150/320
	Grinding	Dremel	light dremel to polish area
YCBGFY	Polishing	Dremel	
YG4QHK	Grinding	Dremel	
YNZHQE	Visual	Stereoscope	
Z2N4AE	Sanding	Sand paper	4/0
	Polishing	Rotary Tool	polish paste
Z4CF9K	Sanding	Sand paper	220, 500, and 1200
	Polishing	Dremel	green buffing tip

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
Z6MDL3	None		
	Grinding	Dremel	
	Polishing	Dremel	
	Cleaning	Acetone	

ZDGQFA	Polishing	Dremel	

ZKZUMC	Polishing	Dremel	

ZMN6LH	Cleaning	Acetone	
	Polishing	Dremel	

Response Summary		Participants: 255
Sample Preparation		
Visual Method:	82	
Sanding Method:	94	
Polishing Method:	164	
None:	22	
<p>Note: The total number of preparation methods used is not equivalent to the total number of participants because some participants used more than one sample preparation method.</p>		

Recovery Methods

(listed in order of use)

TABLE 4

Recovery Methods		
WebCode	Method	Time
247GU3	Fry's Reagent	Several Applications over several hours.
287WXJ	Davis' Reagent	1 minute each application
	Turner's Reagent	1 minute each application
	Fry's Reagent	1 minute each application
29YTKR	MagnaFlux	
	Fry's Reagent	
	Turner's Reagent	
	Davis	
	Nitric Acid 25 %	
	Nitric Acid	
2B6BL9	Acid Etch Method	
	Magnetic Particle Inspection (MPI)	
	Ferric Chloride	30 seconds - 1 minute
	Acidic Ferric Chloride	30 seconds - 1 minute
	25% Nitric Acid	30 seconds - 1 minute
	Davis Reagent	30 seconds - 1 minute
	Fry's Reagent	30 seconds - 1 minute
	Turner's Reagent	30 seconds - 1 minute
2DTMKE	MagnaFlux	
	Davis Reagent	3 minutes
	Turner's Reagent	3 minutes
2EPZ6L	Fry's Reagent	30 hours
	MagnaFlux	
		ALTERNATED FRY'S AND MAGNAFLUX 30 MINS, 30 MINS, 2 HOURS, 2 HOURS, 1 HOUR = 6 HOURS IN TOTAL
2GDC6R	Acidic Ferric Chloride	Three (3) applications. First application 10 minutes, second application 30 minutes, final application 1 hour.
2KXEVS	Fry's Reagent	90 min by swabbing reagent
	MagnaFlux	
	Acidic Ferric Chloride	2 minutes by swabbing reagent
	Nitric Acid	60 mins by swabbing reagent

TABLE 4

Recovery Methods

WebCode	Method	Time
2LBV9B	Fry's Reagent	30 minutes
	Acidic Ferric Chloride	5 minutes
	25% Nitric Acid	20 minutes
2MJ9QD	MagnaFlux	
	Acid Etch Method	Swabbed across defaced surface for several minutes.
2P8KPH	Fry's Reagent	Varied. Increased from approx 1 - 20 minutes.
	Acidic Ferric Chloride	Varied. Increased from approx 1 - 10 minutes.
	Nitric	Varied. Approx. 1-5 minutes
	Sodium Hydroxide	Varied. Approx. 1-5 minutes
2RD3NE	Acid Etch Method	10 min
2RW4C2	60% HCl Acid	45 minutes
	Sodium Hydroxide	5 minutes
	Fry's Reagent	1 hour
	Acidic Ferric Chloride	1 hour
	20% Nitric Acid	20 minutes
	Acidic Ferric Chloride	15 minutes
	Carpenter's Reagent	45 minutes
	Fry's Reagent	1 hour
	Cupric Ammonium Chloride	7 hours
	Fry's Reagent	2 hours 45 minutes
2UGX8G	Fry's Reagent	30
2X3MRU	Ferric Chloride	1 Hr
	Acidic Ferric Chloride	3 Hr
2Z96PP	Acidic Ferric Chloride	15 minutes
3B3VUU	MagnaFlux	
	Fry's Reagent	~1 hr with repeated reapplication
	Turner's Reagent	<1 minute
	MagnaFlux	
3DQ8TZ	MagnaFlux	
	Fry's Reagent	a few minutes
	Acidic Ferric Chloride	a few minutes
	Acid Etch Method	a few minutes
3L7VLF	MagnaFlux	
	Fry's Reagent	1 hour

TABLE 4

Recovery Methods		
WebCode	Method	Time
3MXUZE	Griffin Reagent	15 seconds at a time for ~1.5 hours
	Turner's Reagent	30 seconds at a time for ~4 hours
	Davis Reagent	one application for 10 seconds
	MagnaFlux	
3RTL9B	MagnaFlux	
	Ferric Chloride	5 minutes
	Acidic Ferric Chloride	5 minutes
	Phosphoric/Nitric Acid	5 minutes
	Nitric Acid	5 minutes
	Sodium Hydroxide	5 minutes
	Davis' Reagent	5 minutes
	Turner's Reagent	5 minutes
3W7GUZ	MagnaFlux	
	Fry's Reagent	approx 1 minute
	Turner's Reagent	approx 1 minute
3XHFQU	Fry's Reagent	30 Alternating with N&A
	Nicles & Alloy	
42WDWW	Nitric acid 25%	10 minutes, overnight (after frys)
	Fry's Reagent	wipe on with swab, leave 1-2 seconds then wipe off. repeat
44G8PQ	Turner's Reagent	10 minutes
	Fry's Reagent	10 minutes
	Acidic Ferric Chloride	10 minutes
47A4DK	Acid Etch Method	
	Fry's Reagent	
	Turner's Reagent	
	Griffin Reagent	
	Acidic Ferric Chloride	4. ~30 seconds
	MagnaFlux	1. minutes
	Magnetic Particle Inspection (MPI)	
	Electro-magnetic	
Electro-acid	2. Cupric ~1 minutes	
4AJGVJ	MagnaFlux	

TABLE 4

Recovery Methods		
WebCode	Method	Time
4FDDKA	Fry's Reagent	If you mean applied and left to sit in place, it wasn't. Each swab full was brushed across the area of interest for 30 to 60 seconds before using a new swab.
4H2PJF	Fry's Reagent	15 minutes
	Griffin Reagent	5 minutes
4MWGRC	MagnaFlux	
	Griffin Reagent	5-15 seconds
	Fry's Reagent	5-15 seconds
	MagnaFlux	
	Griffin Reagent	5-15 seconds
	Fry's Reagent	5-15 seconds
	Acid Etch Method	5-15 seconds
	Fry's Reagent	2-3 minutes
	Acid Etch Method	2-3 minutes
	Acid Etch Method	2-3 minutes
	MagnaFlux	
	Acid Etch Method	2-3 minutes
4P3W8V	Turner's Reagent	varied/multiple applications
	Fry's Reagent	varied/multiple applications
	Electro-acid	varied/multiple applications
4YP3X8	Fry's Reagent	hours
62BY7X	MagnaFlux	
	Turner's Reagent	5 minutes
	Davis	10 minutes
	10% Sodium Hydroxide	3 minutes
	25 % Nitric Acid	3 minutes
	Acidic Ferric Chloride	10 minutes
	Ferric Chloride	5 minutes
636ULF	Fry's Reagent	Alt between chemicals for 15hrs 15 minutes
	Turner's Reagent	
673BYA	MagnaFlux	
	Acid Etch Method	Davis, Turner's, Fry's, 25% nitric acid-multiple applications, several minutes each
	Electro-acid	several minutes

TABLE 4

Recovery Methods		
WebCode	Method	Time
67LCNW	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	1 minute intervals x10
	Nitric Acid	1 minute intervals x10
	Magnetic Particle Inspection (MPI)	
6C83AR	Magnetic Particle Inspection (MPI)	~ 30 seconds
	Ferric Chloride	.5 - 2 minutes
	Acidic Ferric Chloride	.5 - 2 minutes
	Phosphoric Acid	.5 - 2 minutes
	Nitric Acid 5% - 10%	.5 - 2 minutes
	Fry's Reagent	.5 - 2 minutes
	Electrolytic - Turners	.5 - 2 minutes
6CQV3P	MagnaFlux	
	Acid Etch Method	HNO3 15 MIN
	Fry's Reagent	15 MIN
	Acid Etch Method	DAVIS 5 MIN
	heat with a torch	
	Acid Etch Method	HNO3 AND FRY 2 MIN
	Acid Etch Method	FRY AND DAVIS 2 MIN
SANDING	1000 GRIT SIZE	
6F8E7R	Magnetic Particle Inspection (MPI)	
	Acid Etch Method	10-20 seconds
6GKTRF	Acid Etch Method	20 minutes
	Fry's Reagent	20 minutes
	Electro-acid	15 minutes
6HWRNA	Fry's Reagent	5 to 10 seconds
6KK4MF	MagnaFlux	
	Acidic Ferric Chloride	15 minutes
	Electro-magnetic	
6V3KFM	Fry's Reagent	
6YMM7T	Turner's Reagent	approx. 3 minutes
	Fry's Reagent	cumulatively, approx. 2 hours
762XQ8	Fry's Reagent	5 seconds a swipe
	Turner's Reagent	5 seconds a swipe
	10% Sodium Hydroxide	5 seconds a swipe
	Acidic Ferric Chloride	5 seconds a swipe
	Ferric Chloride	5 seconds a swipe

TABLE 4

Recovery Methods		
<u>WebCode</u>	<u>Method</u>	<u>Time</u>
79Z9M8	MagnaFlux	
	Fry's Reagent	1-2 sec
	Turner's Reagent	1-2 sec
	Ferric Chloride	1-2 sec
	Acidic Ferric Chloride	1-2 sec
	10% Sodium Hydroxide	1-2 sec
	Sanding	

7AH3MG	Fry's Reagent	50 minutes

7BBYAP	Acid Etch Method	Total of 5 hours
	Ferric Chloride	2 hours
	Acidic Ferric Chloride	3 hours

7CPKLC	Acid Etch Method	20

7ERJW6	MagnaFlux	1 minute
	Acidic Ferric Chloride	1 minute
	Fry's Reagent	30 seconds
	Davis Reagent	2 minutes
	Turner's Reagent	2 minutes
	Fry's Reagent	10 minutes
	Phosphoric/Nitric	1 minute
	Fry's Reagent	30 minutes

TABLE 4

Recovery Methods		
WebCode	Method	Time
8DAPUA	Acid Etch Method	
	Davis's Reagent	10 min
	Fry's Reagent	15 min
	Turner's Reagent	20 min
	Fry's Reagent	15 min
	Turner's Reagent	10 min
	Fry's Reagent	15 min
	Turner's Reagent	10 min
	Fry's Reagent	20 min
	Turner's Reagent	10 min
	Acidic Ferric Chloride	2 min
	Ferric Chloride	3 min
	Turner's Reagent	10 min
	MagnaFlux	10 min
	Fry's Reagent	13 min
	25% Nitric Acid	3 min
	Fry's Reagent	15 min
	Turner's Reagent	15 min
	Electro-acid	20 min
	Turner's Reagent	10 min
Fry's Reagent	10 min	
25% Nitric Acid	2 min	
8K2UVQ	Fry's Reagent	2-3 seconds
	Nitric Acid	2-3 seconds
	MagnaFlux	
	Heyn's Solution	2-3 seconds
8MZAZ9	Acidic Ferric Chloride	10 minutes
8PNLYD	Fry's Reagent	hours
	20% HCl	hours
	Fry's Reagent	hours
8TCNYE	Turner's Reagent	applied with swab (5 hrs)
	Fry's Reagent	applied with swab (5 hrs)
8UYZGC	Fry's Reagent	20 MINUTES
8ZQ8YK	Griffin Reagent	30 min
	MagnaFlux	

TABLE 4

Recovery Methods		
WebCode	Method	Time
92YJGM	Acid Etch Method	Ninety (90) minutes
	Ferric Chloride	Thirty (30) minutes
	Acidic Ferric Chloride	Sixty (60) minutes
96CJDD	Fry's Reagent	40min.
99ZVCJ	Davis Reagent	
	Turner's Reagent	
	Fry's Reagent	
9B3TMC	Fry's Reagent	swabbed & pooled
	HCL	swabbed & pooled
	Sodium hydroxide	swabbed & pooled
9D9A3V	Fry's Reagent	
	Cupric ammonium chloride	Both etchants were used over a period of approximately five hours.
9E6RY6	MagnaFlux	
	Acid Etch Method	10 min
	MagnaFlux	2 min
	Acid Etch Method	3 min
	MagnaFlux	
	Acid Etch Method	8 min
	MagnaFlux	30 Sec
	Acid Etch Method	5 min
	MagnaFlux	
	Acid Etch Method	6 min
	Acid Etch Method	5 min
9GT4XA	MagnaFlux	
	Fry's Reagent	cumulatively 30 minutes
9JETHM	Fry's Reagent	15 minuts approximately
	Turner's Reagent	15 minuts approximately
	Davis	15 minuts approximately
	Nitric acid	15 minuts approximately
9LNXVB	MagnaFlux	
	Fry's Reagent	20 minutes
	Acid Etch Method	20 minutes (25% Nitric Acid)
	Acidic Ferric Chloride	18 hours (overnight)
	Fry's Reagent	20 min. wait btw. 2 final applications

TABLE 4

Recovery Methods		
WebCode	Method	Time
9LZUF	MagnaFlux	
	Fry's Reagent	
	NaOH (10%)	
	Turner's Reagent	Total of 2 hours for all chemicals
9NN7YL	Examination and Restoration of Erased Identification Numbers/Markings	8 minutes
9RBNG7	Acid Etch Method	
	Electro-magnetic	
9UG7F3	Acid Etch Method	approx. 35 hours total
9WK2Y6	MagnaFlux	
	Polishing with dremel	
	MagnaFlux	
	Polishing with dremel	
	MagnaFlux	
	Polishing with dremel	
	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	5 minutes w/swabbing
	Polishing with dremel	
	Fry's Reagent	3 minutes w/swabbing
	Fry's Reagent	3 minutes w/swabbing
	Acid Etch Method	25% nitric acid - 1 minute w/swabbing
	Fry's Reagent	2 minutes w/swabbing
	Acid Etch Method	Davis Reagent - 3 minutes w/swabbing
	Acid Etch Method	Davis Reagent - 3 minutes w/swabbing
	Acid Etch Method	Davis Reagent - 3 minutes w/swabbing
	Turner's Reagent	2 minutes w/swabbing
Fry's Reagent	2 minutes w/swabbing	
Acid Etch Method	Davis Reagent - 3 minutes w/swabbing	
9XYHWP	MagnaFlux	
	Turner's Reagent	5 min
	Fry's Reagent	5 to 10 min
	Fry's Reagent	5 to 10 min
	MagnaFlux	
	Fry's Reagent	5 min intervals with rinsing between
	MagnaFlux	
Davis Reagent	5 to 10 min	

TABLE 4

Recovery Methods		
WebCode	Method	Time
9Y9DYB	MagnaFlux	
	Fry's Reagent	10-15 minutes approx. 15 times
A6RZ7L	MagnaFlux	20 minutes at least
	Fry's Reagent	20 minutes at least
	Turner's Reagent	20 minutes at least
ABJAFJ	MagnaFlux	
	Fry's Reagent	90 min
	Turner's Reagent	30 min
	HNO3 25%	10 min
ACV292	MagnaFlux	
	Davis reagent	20 seconds
	Turner's Reagent	20 seconds
	Fry's Reagent	20 seconds
	Acidic Ferric Chloride	20 seconds
	modified fry's reagent	15 minutes
	Turner's Reagent	20 minutes
	modified fry's reagent	20 minutes
AFD4DK	Acid Etch Method	15 minutes
AMEJ28	Fry's Reagent	15 minutes
AMTZ3R	Electro-magnetic	
	Acid Etch Method	
	Fry's Reagent	
	Griffin Reagent	
AN8CYC	Fry's Reagent	10 minutes
	Fry's Reagent	8 min
	Fry's Reagent	10 min
	Fry's Reagent	10 min
	Fry's Reagent	8 min
APY9LK	MagnaFlux	
	Acid Etch Method	HNO3 30-40%, 15 minutos
	Fry's Reagent	15 minutos
	Heated with gas torch	2 minutos
	Acid Etch Method	HNO3 30-40%, 2 minutos
	Fry's Reagent	2 minutos
	Davis 's Reagent	2 minutos
	Fry's Reagent	2 minutos

TABLE 4

Recovery Methods		
WebCode	Method	Time
AQRCXR	Fry's Reagent	Minimal
	Turner's Reagent	Minimal
	Davis	Minimal
ATJACQ	Acid Etch Method	25% Nitric acid / seconds
	Fry's Reagent	Seconds initially, then minutes
ATYJGK	MagnaFlux	Nitric acid, chlorohydric acid and fry were used for 1 hour alternately
AUD6T8	MagnaFlux	
	Fry's Reagent	
	Davis, Turners, 25% Nitric Acid, 10% Sodium Hydroxide, Ferric Chloride, Acidic Ferric Chloride	
	Electro-acid	
B4UC3G	MagnaFlux	
	Turner's Reagent	I spent about 15 minutes total with Turner's reagent, but was constantly swiping reagent over area with swabs.
	Fry's Reagent	I spent about 30-45 minutes total with Fry's reagent, but was constantly swiping reagent over area with swabs. The serial number was visualized after less than five minutes; further processing was done with the intent to clarify number.
BAKLDE	Acid Etch Method	Davis reagent, wiped across with a swab - seconds
	Turner's Reagent	wiped across with a swab - seconds
	Fry's Reagent	wiped across with a swab - seconds, used Turner's as highlighter
	MagnaFlux	
	Electrolytic	Turner's, diluted Fry's, wiped across with a swab - seconds
BVZ4KB	HNO3 at 25%	
	CuSO4	
	HCl at 25%	
BY32TH	Acid Etch Method	Approximately 40 minutes various acids
	Electro-acid	Approximately 15 minutes

TABLE 4

Recovery Methods		
WebCode	Method	Time
C4DEBG	MagnaFlux	N/A
	Fry's Reagent	90 min
	Turner's Reagent	10 min
	Acidic Ferric Chloride	30 min
	10 min	Davis's Reagent
	10 min	Hydrochloric Acid
	10 min	Nitric Acid
C6HZZ3	MagnaFlux	
	Fry's Reagent	
	Phosphoric/Nitric Acid	
C7F9DR	Fry's Reagent	8 to 12 hours
CC7MV8	MagnaFlux	
	Davis reagent	~30 minutes
	Turner's Reagent	~3 hours
	Fry's Reagent	~30 seconds
	Turner's Reagent	~1 hour
CE9L7Z	Acid Etch Method	1 min.
CJL7F8	Fry's Reagent	0:45
	Davis's	3:30
CKZTP9	Acidic Ferric Chloride	10 min
	Fry's Reagent	15 min
	Acidic Ferric Chloride	5 min
CZAJRD	MagnaFlux	
	Fry's Reagent	several seconds at a time
D92E43	MagnaFlux	
	Turner's Reagent	
	Fry's Reagent	
	Acid Etch Method	
DACCHK	Fry's Reagent	3 to 5 minutes
DCZNGP	MagnaFlux	2 Min
	Fry's Reagent	3 Hours
	Acid Etch Method	3 Hours
	Phosphoric Acid	30 Min
	Acidic Ferric Chloride	30 Min

TABLE 4

Recovery Methods		
WebCode	Method	Time
DJG9GG	Magnetic Particle Inspection (MPI)	N/A
	Davis Reagent	Approximately 5 minutes
	Turner's Reagent	Approximately 5 minutes
	Fry's Reagent	Approximately 5 minutes
	Electro-acid	Approximately 10 minutes
	25 % Nitric Acid	Approximately 5 minutes
	Acidic Ferric Chloride	Approximately 5 minutes
DKHW6L	Magnetic Particle Inspection (MPI)	minutes
	Turner's Reagent	seconds
	Fry's Reagent	seconds
DTN2VH	Fry's Reagent	multiple swipes over ~2 hours alternating acids
	Acidic Ferric Chloride	multiple swipes over ~2 hours alternating acids
	MagnaFlux	n/a
DU3DPF	MagnaFlux	N/A
	Turner's Reagent	N/A
	Fry's Reagent	N/A
	Davis Reagent	N/A
E3RKMC	MagnaFlux	
	Acidic Ferric Chloride	
E3T9AG	10% Nitric Acid	10 minutes
	Fry's Reagent	7 minutes
	Fry's Reagent	5 minutes
	MagnaFlux	5 minutes
	Fry's Reagent	10 minutes
	10% Nitric Acid	7 minutes
	MagnaFlux	5 minutes
	Fry's Reagent	10 minutes
	Fry's Reagent	20 minutes
	10% Nitric Acid	240 minutes
	10% Nitric Acid	75 minutes
	Acidic Ferric Chloride	45 minutes

TABLE 4

Recovery Methods		
WebCode	Method	Time
E6HMTZ	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	2 minutes
	Turner's Reagent	2 minutes
	Acidic Ferric Chloride	2 minutes
	Ferric Chloride	2 minutes
	Davis' Reagent	2 minutes
	Fort's Solution	2 minutes
	20% Hydrochloric Acid	1 minutes
	25% Nitric Acid	1 minutes
	Fry's Reagent	total of 20 minutes on second day and total of 5 minutes on third day
	25% Nitric Acid	total of 5 minutes on second day
	Fort's Solution	total of 5 minutes on second day and total of 20 - 30 minutes on third day
	25% Nitric Acid	total of 5 minutes on third day
E6UJX6	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	
EAC4Z8	MagnaFlux	
	Fry's Reagent	
EDR9E9	Fry's Reagent	2 minutes
	25% Nitric Acid	1 minute
	Turner's Reagent	2 minutes
	Davis Reagent - Alternated between above listed chemicals	1 minutes
EEMU8Z	Fry's Reagent	As long as it took to restore the characters
EKDYAG	MagnaFlux	
	Davis' Reagent	20 min
	Turner's Reagent	20 min
	Fry's Reagent	60 min
EMYQC7	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	Swabbing, as well as increasing increments of time up to 10 minutes
	Nitric Acid	Swabbing
	Acidic Ferric Chloride	Swabbing, as well as increasing increments of time up to 10 minutes
	Sodium Hydroxide	Swabbing

TABLE 4

Recovery Methods

WebCode	Method	Time
EP69B3	MagnaFlux	
	Sand paper 60 and 220 grit	
	polish with dremel tool	
	MagnaFlux	
	Davis	few mins
	Turner's Reagent	few mins
	Fry's Reagent	10 mins
ER97JA	Turner's Reagent	30 mins
	Turner's Reagent	~2 hours
	Magnetic Particle Inspection (MPI)	
EV8HFA	Fry's Reagent	Acid was continually worked onto surface with cotton applicator until final results. Process took close to 3 hours.
	Davis Reagent	Used for highlighting results
F9CZQA	MagnaFlux	
	Acid Etch Method	Davis' Reagent: Brushed with a swab for 30 second intervals; about 20 minutes total time
	Turner's Reagent	Brushed with a swab for 30 second intervals; about 60 minutes total time
F9FHXX	Fry's Reagent	Along with Turner's as a highlighter: Brushed with a swab for 30 second intervals; about 60 minutes total time
	Nitric Acid	
	Griffin Reagent	
FBHDGN	Magnetic Particle Inspection (MPI)	
	Griffin Reagent	20 min
	Fry's Reagent	10 min
FBZCPE	Davis	5 min
	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	Varying time intervals over a 4 hour period
FEE87C	Nitric Acid	Varying time intervals over a 4 hour period
	Griffin Reagent	Varying time intervals over a 4 hour period
	Fry's Reagent	Between 2 and 20 minutes
FEE87C	Fry's Reagent	15 minutes
	MagnaFlux	
	Fry's Reagent	5-10 minutes at a time

TABLE 4

Recovery Methods		
WebCode	Method	Time
FH2NNW	Acid Etch Method	30 seconds to 1 min
	Fry's Reagent	30 seconds to 1 min
	Turner's Reagent	30 seconds to 1 min
	MagnaFlux	30 seconds to 1 min
	Davis Reagent	30 seconds to 1 min
FL4HNM	Turner's Reagent	
	Davis	
	Fry's Reagent	
	Acid Etch Method	Nitric Acid 10%
	Fry's Reagent	
	MagnaFlux	
	Ferric Chloride Solution	
	Acidic Ferric Chloride	
	Acid Etch Method	sodium hydroxide
Acid Etch Method	Nitric Acid 10%	
FNPCJ3	Magnetic Particle Inspection (MPI)	
	Davis Reagent	For each method, several rounds were applied, beginning with swiping for 10-15 seconds, with increasingly longer times up to 30+ minutes
	Turner's Reagent	
	Ferric Chloride	
	Acidic Ferric Chloride	
	Fry's Reagent	
FWFWMF	MagnaFlux	
FYBYBY	Fry's Reagent	Alternating Turners and Frys for about 2 hours
	Turner's Reagent	Alternating Turners and Frys for about 2 hours
	Acidic Ferric Chloride	Alternating Acidic Ferric Chloride and 10% Sodium Hydroxide for about 30 minutes
	10% Sodium Hydroxide	Alternating Acidic Ferric Chloride and 10% Sodium Hydroxide for about 30 minutes
G766KB	Magnetic Particle Inspection (MPI)	Magnaflux 7Hf and 9CM
	Acid Etch Method	Davis, Turner's and Frye's (multiple alternating applications)

TABLE 4

Recovery Methods

<u>WebCode</u>	<u>Method</u>	<u>Time</u>
G7LCRE	Davis' Reagent Fry's Reagent 25% HNO ₃ Polishing- Dremel (600 grit)	
GEZX2H	Acid Etch Method	Worked with various reagents for about 4 hours total
GKK3PC	MagnaFlux Fry's Reagent Turner's Reagent Davis Reagent Nitric acid 25% Sodium Hidroxide	3 minute 1 hours 1 hours 1 hours 30 min 30 min
GMM2Z6	MagnaFlux Acid Etch Method	
GUQ8F8	MagnaFlux Turner's Reagent Fry's Reagent	<1 min per application, total ~20 min <1 min per application, total ~20 min
GV4GTE	Fry's Reagent MagnaFlux	2 hour 5 min
GVG7U7	MagnaFlux Fry's Reagent	5 minutes
GVKT9Y	Davis Reagent Turner's Reagent Fry's Reagent	30 minutes total 3 hours total 20 hours total
GZZ2WX	Fry's Reagent	5 - 70 minutes
H23J9Y	Fry's Reagent Nitric Acid	35 minutes 15 minutes
H2MYN2	MagnaFlux Acid Etch Method Turner's Reagent Fry's Reagent Acidic Ferric Chloride MagnaFlux	Phosphoric/Nitric - 5 minutes 15 minutes 15 minutes 15 minutes 180 minutes
H8TTHX	Fry's Reagent	60 minutes total over three days
HAKPDH	Fry's Reagent	Between 2.5 and 3 hours

TABLE 4

Recovery Methods

WebCode	Method	Time
HBVPAD	Polishing	No Results
	MagnaFlux	No Results
	Fry's (1x application)	10 minutes, no agitation
	Davis (1x application)	20 minutes, repeated swabbing agitation
	Davis (4x application)	2 minutes, repeated swabbing agitation
	Fry's (1x application)	2 minutes, spot application
HDGH38	Magnetic Particle Inspection (MPI)	this was done prior to initial sanding as well
	Sanding	coarse, 240, 400, and 600
	Turner's Reagent	swab method
	Acid Etch Method	Davis reagent, swab method
	Fry's Reagent	swab method
	Griffin Reagent	swab method
	Acidic Ferric Chloride	swab method
HDJ29H	Electro-magnetic	
	Acid Etch Method	various
HK49N3	MagnaFlux	
	Fry's Reagent	1-5 minutes or less
	Turner's Reagent	1-5 minutes or less
	Ferric Chloride	1-5 minutes or less
HMAMEG	Acidic Ferric Chloride	Seconds during swabbing
	Ferric Chloride	
	Nitric Acid	
HPAYR9	MagnaFlux	
	Nitric Acid	
	Fry's Reagent	
HVD77B	Fry's Reagent	10
	Ferric Chloride	10
	25% Nitric Acid	10
	Modified Fry's Reagent	45
HWT6QZ	Fry's Reagent	Swiped for 10-15 minutes
J3DKUX	MagnaFlux	
	400 grit sand paper	
	Davis Reagent	applied constantly over approx. 10 min
	Turner's Reagent	applied constantly over approx. 10 min
	Fry's Reagent	applied constantly over approx. 10 min
	25% Nitric Acid	applied constantly over approx. 25 min.

TABLE 4

Recovery Methods

WebCode	Method	Time
J7DWPX	MagnaFlux	This method was used 5 times
	Acid Etch Method	Davis reagent for 2 minutes approximately
	Turner's Reagent	This reagent was used off and on for a total of 2 hours approximately
JAUEQF	MagnaFlux	
	Fry's Reagent	Off and on for about 8 hrs
JBA322	MagnaFlux	
	Fry's Reagent	60 minutes total
JFLJKJ	Phosphoric Acid	
	Acidic Ferric Chloride	
	10% Nitric Acid	
JP8MRJ	Magnetic Particle Inspection (MPI)	
JTRGMX	MagnaFlux	
	Nitric Acid	Alternating with Fry's for 10 min
	Fry's Reagent	After alternating used for 10 min alone
JZLLFY	Fry's Reagent	5 to 10 second intervals
K39MW8	Davis Reagent	A couple seconds per swab. (2-3 swabs were used)
	Turner's Reagent	A couple seconds per swab. (2-3 swabs were used)
	Fry's Reagent	A couple seconds per swab. (50-60 swabs were used)
KEPA8T	Acid Etch Method	Davis Reagent, 4 min
	Turner's Reagent	5 min
	Acid Etch Method	Fort's Solution, 25 min
	Fry's Reagent	30 min
	MagnaFlux	
KKAK3A	Fry's Reagent	Numerous times, 30s - 1 min
	Griffin Reagent	Numerous times, 30s - 1 min
KVA28T	Fry's Reagent	60 seconds
	Turner's Reagent	60 seconds
	Acidic Ferric Chloride	60 seconds
	Magnetic Particle Inspection (MPI)	
	Electro-magnetic	
	every reagent available	60 seconds

TABLE 4

Recovery Methods		
WebCode	Method	Time
KWMUK8	Davis	1 min
	Fry's Reagent	30 seconds
	Davis	1 min
	Fry's Reagent	30 seconds
	Davis	1 min
	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	30 seconds
	Davis	1 minute
	Fry's Reagent	30 seconds
	Davis	1 minute
	Magnetic Particle Inspection (MPI)	
	Fry's/Davis	30 seconds/1 minute
	Fry's/Davis	30 seconds/1 minute
	Fry's/Davis	30 seconds/1 minute
	Fry's/Davis	30 seconds/1 minute
	Fry's/Davis	30 seconds/1 minute
	Fry's/Davis	30 seconds/1 minute
	polish	
	Fry's/Davis	30 seconds/1 minute
	Fry's/Davis	30 seconds/1 minute
Fry's/Davis	30 seconds/1 minute	
Fry's/Davis	30 seconds/1 minute	
KY9C3T	Acid Etch Method	different acids, all in all about one hour
L2YVPC	Fry's Reagent	approximately 30 seconds to 5 minutes
	Magnetic Particle Inspection (MPI)	
	Acid Etch Method	approximately 30-60 seconds
L68KK6	Ferric Chloride	1 Minute
	10% Nitric Acid	1 Minute
	Acidic Ferric Chloride	1 Minute
L9T33P	Acidic Ferric Chloride	A few seconds, several times.
LB436C	Fry's Reagent	2 hours
	Turner's Reagent	2 hours
	Davis' Reagent	3 hours
	25% Nitric Acid	3 hours
LBWXLT	Fry's Reagent	Used several swabs soaked in the reagent and then rubbed on the material.

TABLE 4

Recovery Methods

WebCode	Method	Time
LFRRJU	Davis	< 2 min
	Fry's Reagent	<2 min
	Nitric Acid	<2 min
	MagnaFlux	
LJRZM4	MagnaFlux and Fry's	1 hour approx
LJTNBA	Acidic Ferric Chloride	3 hours
	25% nitric acid	30 minutes
LLH3TR	Acid Etch Method	Aluminum Reagent #6, 2 Minutes
	Fry's Reagent	5 Minutes
	Turner's Reagent	10 Minutes
	Acidic Ferric Chloride	10 Minutes
	Acid Etch Method	Fort's Solution, 5 Minutes
	Acid Etch Method	20 % Hydrochloric Acid, 5 Minutes
	Acid Etch Method	Ferric Chloride, 5 Minutes
	MagnaFlux	
LMTY7A	Fry's Reagent	10 seconds per swab
LWF37W	Turner's Reagent	~1 minute
	Fry's Reagent	~ 2 minutes
	Fry's Reagent	~ 10 minutes
	Fry's Reagent	~ 15 minutes
	MagnaFlux	
	Fry's Reagent	~ 2 minutes
	Fry's Reagent	~ 2 minutes
	Fry's Reagent	~ 3 minutes
Fry's Reagent	~ 2 minutes	
MJRB38	MagnaFlux	
	Davis Reagent	~30 minutes
	Turner's Reagent	~30 minutes
	Fry's Reagent	~4 hours in total. Passing the swab on the surface in amount of ~10 minutes each
	MagnaFlux	
MLD4V2	Acidic Ferric Chloride	brushed on

TABLE 4

Recovery Methods		
WebCode	Method	Time
MPCHHR	Meyer-Eichholz Reagent	20'
	Oberhofer Reagent	15'
	Meyer-Eichholz Reagent	10'
	Wazau Reagent	15'
	Fry's Reagent	5'
	Oberhofer Reagent	5'
N2M8WM	Acid Etch Method	5 min
N4DEEY	Fry's Reagent	60 minutes
	Magnetic Particle Inspection (MPI)	2
	Davis	15 minutes
N4NF2X	MagnaFlux	
	Fry's Reagent	
	Davis's Reagent	
	Nitric acid (25%)	
	Potassium dichromate	
	Turner's Reagent	
N72QE4	Electro-acid	
	Fry's Reagent	About thirty minutes
	Acid Etch Method	5 minutes
	MagnaFlux	1 minute
	Fry's Reagent	1 minutes
	Fry's Reagent	2 minutes
NBB4V3	Phosphoric/Nitric	1 minute
	Turner's Reagent	2 minutes
	Fry's Reagent	5 minutes
	Turner's Reagent	15 minutes
	Fry's Reagent	3 hrs
	MagnaFlux	
NDXLDN	MagnaFlux	
	Fry's Reagent	approximately 20 second increments
	Turner's Reagent	approximately 30 second increments
NMP2Z7	Fry's Reagent	various
	Turner's Reagent	various
	Nitric Acid (25%)	various

TABLE 4

Recovery Methods		
WebCode	Method	Time
NVU9F7	Ferric Chloride	15 min.
	Acidic Ferric Chloride	5 min.
	Fry's Reagent	10 min.
P24NPU	Fry's Reagent	1 minute
	25% Nitric Acid	1 minute
	Fry's Reagent	1 minute
	25% Nitric Acid	1 minute
	Fry's Reagent	1 minute
	25% Nitric Acid	1 minute
	Fry's Reagent	1 minute
	25% Nitric Acid	1 minute
P2H9H6	Fry's Reagent	<1 minute each pass
	25% Nitric Acid	<1 minute each pass
P7UXYT	MagnaFlux	
	Acid Etch Method	
P9MRWW	other chemical method: WAZAU and Mipro acier.	One (01) hour
PAUAVT	Fry's Reagent	approximately 15 minutes over multiple applications
	25% Nitric Acid	approximately 10 minutes over multiple applications
PFZ3PN	Acid Etch Method	Davis Reagent-20 min
	Turner's Reagent	30 min
	Fry's Reagent	60 min
	Turner's Reagent	20min
	Fry's Reagent	40 min
PNEPYR	Turner's Reagent	4 - 5 Minutes
	Fry's Reagent	4 - 5 Minutes
PQL8WN	Acid Etch Method	~ 1.5 hours
PRC7BL	Fry's Reagent	Several 2 min 30s exposures to Fry's Reagent, until restoration allows an identification.
PXHXL6	Fry's Reagent	<30 sec
	Acidic Ferric Chloride	<30 sec
	25% Nitric Acid	<30 sec
Q4JFD3	Acid Etch Method	5-10 Min. Multiple Applications

TABLE 4

Recovery Methods		
WebCode	Method	Time
Q4ZRUM	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	20
	Fort's Solution	10
	Turner's Reagent	25
	Davis' Reagent	25
	Acidic Ferric Chloride	30
	Ferric Chloride	10
	25% Nitric Acid	10
QL3CUV	Davis	20 seconds
	Turner's Reagent	20 seconds
	Fry's Reagent	20 seconds
QQW7RW	MagnaFlux	
	Fry's Reagent	1-2 HOURS THEN OVERNIGHT
	MagnaFlux	
QXYFXP	MagnaFlux	
	Fry's Reagent	minimal time <2 minutes
QZ3BGT	Fry's Reagent	~2 hours
	MagnaFlux	5-10 minutes
	Acidic Cobalt Chloride	Combined time of ~1-2 hours
	Fry's Reagent	~2-3 hours
R2EAC2	MagnaFlux	
	Fry's Reagent	60 minutes
	Turner's Reagent	30 minutes
	Davis's reagent	30 minutes
	Nitric Acid reagent	15 minutes
R4JQT7	Acid Etch Method	~1 second
R7BP84	MagnaFlux	before and after polishing with Dremel (sanding attachment)
	Davis' Reagent	10-15 seconds
	Turner's Reagent	10-15 seconds
	MagnaFlux	
	Fry's Reagent	10-15 seconds
	MagnaFlux	
	polishing	sand paper & Dremel with polishing pad/compound
	Fry's Reagent	10-15 seconds
	MagnaFlux	

TABLE 4

Recovery Methods		
WebCode	Method	Time
R7NМУZ	Griffin Reagent	20 min
	Acid Etch Method	20 min
	Acidic Ferric Chloride	10 min
R8LQT3	MagnaFlux	
	Electro-magnetic	
	Acid Etch Method	Davis 5 mins
	Turner's Reagent	Turner 5 mins
	Fry's Reagent	various iterations with polishing in between; 3 hours
RH2MQT	Acidic Ferric Chloride	30-50 min
RJA3WZ	Acidic Ferric Chloride	15-20 minutes
RKPYPY	Acid Etch Method	10 minutes
T34XAM	Davis	minutes
	Turner's Reagent	hours
	Fry's Reagent	hours
TKK3UU	Fry's Reagent	60 minutes
	Davis	15 minutes
	Magnetic Particle Inspection (MPI)	5 minutes
	Acid Etch Method	45 minutes
TM9DTY	Turner's Reagent	just swiped a cotton swab over many times
	Fry's Reagent	just swiped a cotton swab over many times
TWDNZP	Acidic Ferric Chloride	2 hours
TZFLBH	MagnaFlux	NEGATIVE RESULTS
	Davis Reagent	APROX 1 HR
	Turner's Reagent	APROX 1 HR
	Fry's Reagent	APROX 1HR
	Turner's Reagent	APROX 1 HR
UAH4JY	MagnaFlux	
	Fry's Reagent	
	Turner's Reagent	
	Acid Etch Method	Half an hour
	Acid Etch Method	Half an hour
	Acid Etch Method	Half an hour
UH9PPX	Acid Etch Method	10-15 minutes

TABLE 4

Recovery Methods		
WebCode	Method	Time
UM74CM	Fry's Reagent	5 minutes / rinse with acetone
	Dremel/polishing/sanding	
	Fry's Reagent	15 minutes / rinse with acetone
	Fry's Reagent	15 minutes / rinse with acetone
	Fry's Reagent	15 minutes / rinse with acetone
UQ3UHY	MagnaFlux	
	Fry's Reagent	30 sec to 2 minute intervals
	10% Nitric Acid	30-60 sec
	Davis Reagent	several minutes
UU6TTQ	The sample was eaten away chemical solution $\text{CuCl} \cdot 2\text{H}_2\text{O} + \text{HCl} + \text{H}_2\text{O}$	Time 30 min.
UWT6RW	MagnaFlux	
V6J6LF	Restor-A-Gel	~11 hours
VFG6YJ	Fry's Reagent	10-15 minutes
VLTTF	Magnetic Particle Inspection (MPI)	6 hours
	Fry's Reagent	
	Turner's Reagent	
	MagnaFlux	
	Acidic Ferric Chloride	
	Davis Reagent	
	10% Sodium Hydroxide	
	20% Nitric Acid	
25% Nitric Acid		
VZTQ4Z	MagnaFlux	
	Acid Etch Method	multiple applications
W2XM4U	MagnaFlux	
	Fry's Reagent	
	Phosphoric/Nitric Acid	
	Nitric Acid	
	Acidic Ferric Chloride	
	Fry's Reagent	
WAAYWL	Magnetic Particle Inspection (MPI)	
	Acid Etch Method	Intervals

TABLE 4

Recovery Methods		
WebCode	Method	Time
WHPK7P	Davis	3-6 seconds
	Turner's Reagent	3-6 seconds
	Fry's Reagent	3-6 seconds
WKTFPT	Fry's Reagent	multiple hours
	Turner's Reagent	used to highlight
	NITRIC ACID	swiped on and off throughout process
	DAVIS REAGENT	swiped on and off throughout process
WYAB6P	Acid Etch Method	20 minutes
X3N9AQ	Acid Etch Method	
	Fry's Reagent	
	Turner's Reagent	
	Griffin Reagent	
	Acidic Ferric Chloride	5 to 10 minutes
	MagnaFlux	minutes
	Magnetic Particle Inspection (MPI)	
	Electro-magnetic	
Electro-acid	5 to 10 minutes	
X42T32	Fry's Reagent	15 - 30 seconds at a time - 3 treatments
	NaOH	15 seconds
	Polish	Dremel - 425 grit wheel
	Fry's Reagent	30 seconds at a time - 3 treatments
X4Z6FV	MagnaFlux	
	Fry's Reagent	5-15 min
	Turner's Reagent	5-15 min
	Davis' Reagent	5-15 min
	Nitric acid 25%	5-15 min
Concentrated Nitric acid	5-15 min	
X6Q4UU	Acid Etch Method	10 minutes
XEYTF6	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	
	Acidic Ferric Chloride	
XPKUXZ	Fry's Reagent	12
	Nickles & Alloy	alternating with Fry's for 10 minutes
XTGNMN	Fry's Reagent	
	Turner's Reagent	
	Acid Etch Method	

TABLE 4

Recovery Methods		
WebCode	Method	Time
XV8MAZ	Magnetic Particle Inspection (MPI)	
	Turner's Reagent	3 min
	Fry's Reagent	10 min
XVM7UW	MagnaFlux	
	Davis Reagent	30 mins
	Turner's Reagent	30 mins
	Fry's Reagent	30 mins
XXBHT3	25% Nitric Acid	up to 1 minute
	Fry's Reagent	Up to 2 minutes
Y4WV8V	Fry's Reagent	5-10 minute intervals
Y7NQU4	MagnaFlux	
	Turner's Reagent	multiple 5 minute
	Griffin Reagent	multiple 5 minute
	Acid Etch Method	multiple 5 minute
	Fry's Reagent	multiple 10 minute
Y8VARZ	Acid Etch Method	Etched with continuous swabbing of the acid over the number for approximately 10 hours using 10% Sodium Hydroxide, 25% Nitric Acid, Phosphoric/Nitric Acid, Ferric Chloride, Acidic Ferric Chloride, Turner's Reagent, Davis' reagent, and Fry's Reagent
	Electro-acid	Etched with continuous swabbing of the acid over the number for approximately 1 hour using Fry's Reagent
	MagnaFlux	Material was very lightly magnetic
Y99KNJ	Fry's Reagent	swabbed on briefly and then also allowed to sit for less than 15 minutes
	5%NaOH	briefly swabbed area
	25% Nitric acid	briefly swabbed area
YCBGFY	MagnaFlux	
	Fry's Reagent	Apply chemical with a swab and swipe in one direction. I don't let the chemical pool.
	Turner's Reagent	Apply chemical with a swab and swipe in one direction. I don't let the chemical pool.
	Davis Reagent	Apply chemical with a swab and swipe in one direction. I don't let the chemical pool.
YG4QHK	Acid Etch Method	Davis/Turner/Fry's: 3 hours

TABLE 4

Recovery Methods		
WebCode	Method	Time
YNZHQE	Acidic Ferric Chloride	Approx 5 seconds
Z2N4AE	Fry's Reagent Wazau Mipro acier	
Z4CF9K	Fry's Reagent	used for 10-15 minutes total
Z6MDL3	MagnaFlux Electro-acid	
ZDQQFA	Magnetic Particle Inspection (MPI) Fry's Reagent Turner's Reagent Acid Etch Method	N/A 1 hour 1 hour 1 hour
ZKZUMC	Magnetic Particle Inspection (MPI) Acid Etch Method	Total: > 45 minutes
ZMN6LH	Acid Etch Method phos acid nitrc acid phos acid nitric acid sodium hydro ferric	5 sec 5sec 3 sec 5 sec 5 sec 7 sec 5 sec

Response Summary

Participants: 253

Recovery Methods

Chemical Processing: 245

Magnetic Processing: 130

Note: The total number of recovery methods used is not equivalent to the total number of participants because some participants used more than one recovery method.

Additional Comments

TABLE 5

WebCode	Additional Comments
287WXJ	Worked on this test for multiple days over the course of a month and still unable to recover the whole serial number. Personally do not feel like this case mimics casework accurately.
2B6BL9	Magnaflux and magnetic particle inspection were repeatedly attempted throughout the restoration process. MPI produced the only partially visible character: possible "A".
2DTMKE	It was noted that the milled section of the steel bar as received had been milled very deeply. Depth of milling measured from approximately 0.0033 to 0.0038 inches. During restoration, the general shapes of some of the characters could be visualized but they were not specific enough to make a definitive conclusion.
2EPZ6L	Much harder than any of the previous CTS tests I have done. Virtually nothing revealed by etching with Fry's and number not particularly clear with MAGNAFLUX. Not sure if a problem with the test piece?
2GDC6R	First digit of serial number was right on the edge of the cut-out section of bar stock. This made it difficult to work with that area of the serial number.
2MJ9QD	The entire defaced number could not be restored on this test. This seems to be becoming a regular occurrence over the last several cycles of this test. Our lab has had multiple tests taken by multiple examiners in which the entire number could not be restored. This does not appear to be an examiner issue but a test issue, possible due, but not limited too, excessive removal of material, poor machining, poor stamping, and/or poor quality control. The test sample from 21-5250 appeared to have been defaced via multiple passes with a material removal depth ranging from 0.030 to 0.037 inches.
2RW4C2	Very difficult etch due to the hard metal, the approximately 1 mm of metal removal (particularly deep) and the prominent milling marks (requiring considerable sanding to polish the surface). Found that most chemicals apparently useful for this type of metal unsuccessful. MPI and MagnaFlux are not available at our lab. Would recommend an easier test (softer metal i.e. standard steel generally encountered with firearms, less metal removal and/or less aggressive removal technique) as busy labs do not have the time/resources to dedicate a couple of shifts (numerous hours) in an attempt to complete a proficiency test.
2X3MRU	The first character could be either a B or 8.
2Z96PP	Difficult to differentiate between 'B' and '8'.
47A4DK	Methods: Serial Number Magnetic, thermal, and chemical methods may be used for the restoration of serial numbers. Conclusions regarding restored characters are made by visual examination of the restored surface under a variety of lighting conditions. Information regarding the alpha-numeric structure or the general location of serial numbers is obtained when necessary from reference sources or from firearms in the Laboratory's Reference Firearms Collection. Limitations: Serial Number With the exception of the magnetic method, serial number restoration is a destructive examination and it is possible that the obtained results may not be reproduced in any subsequent examinations. Restored serial numbers are sometimes only visible during a portion of the reconstruction process, and are not necessarily visible at the conclusion of the process.

TABLE 5

WebCode	Additional Comments
4MWGRC	The fourth character was not visualized clearly after numerous attempts of a variety of methods.
4YP3X8	Each year we have done this test the characters are becoming more difficult. Are they numbers being stamped to ATF standards?
636ULF	After initial application of Fry's reagent, the first two characters and the last started to resemble letters and numbers, while the remaining characters never developed into any discernable alphanumerics (only partial shapes).
673BYA	No characters were restored. Using magnaflux prior to any surface prep, I was able to see 6 partial characters, but could not determine with confidence what any of them were, and could therefore, not determine the proper orientation of the characters. I measured the thickness of my bar stock on either side of the defaced area (0.250 inch and 0.249 inch). I also measured the sides of the defaced portion (0.218 inch and 0.215 inch). One of the edges of the defaced area had a ridge and appeared as though the bar stock had possibly passed through an end mill twice. No characters were restored during acid chemical application (multiple chemicals applied multiple times, including electrolytic plus acid). It appears as though an excessive amount of material was removed, which prevented the numbers from being able to be restored successfully.
67LCNW	In this case, the different methods produced a character that appeared different under certain conditions. The first character appeared to be an 8 throughout much of the process, but MPI revealed a likely B. If given a serial number structure guide, similar to what is at our disposal for most firearms we would come across during routine casework, an issue of which of these characters it is would be resolved. It is clearly either an 8 or a B, based on the roundness (or lack thereof) of the left side of the character and if a structure guide was provided with this test, it would help in identifying if that character is an alpha or a numeric.
6CQV3P	THE TWO DIGITS OF THE CENTER PRESENTED DIFFICULTY TO RESTORE
6GKTRF	It would be beneficial to get some different methods of obliteration rather than everything being milled. These tests don't represent real world examples very well.
762XQ8	The fourth characters never cleared up enough to be definitively called and photographed. Two parallel lines were seen. It could be an H or an N but, without seeing the connecting bar there is the possibility that it is an entirely different character.
7BBYAP	The first character could be either a "B" or an "D". The third character could be either a "3" or an "8". The fourth character could be either a "N" or an "H".
7ERJW6	Over the past year the quality of these serial number tests has declined. It does not appear that the bar stock material or method of obliteration has changed; however, the quality of the stamp/die used to appears to be the problem. It is apparent that the tool used has either worn to the point where it is not stamping with defined margins or has been replaced with an inferior tool and as such the serial number restoration is extremely difficult and nearly impossible for some characters. The characters appear as shadowed or rounded without defined edges. The same reagents used in the attempt to restore this proficiency are also being used in casework with no issues and successful timely restoration.
8PNLYD	The amount of metal removed from the s/n area was significant. The addition of milling marks created a further complication. The mill did not appear to be level with the surface of Item 1 as the depth of metal removed from the first digit to the last was different.

TABLE 5

WebCode	Additional Comments
92YJGM	1. Acid was cleaned with delicate task wipers constantly to write down the characters appearing during each step. After the restoration process, sodium bicarbonate solution was used to neutralize acid residues on the surface. 2. The empty space at positions 1,3 and 4 in the serial number means a character that could not be restored. 3. The position 1, in the serial number means the possibility of the following characters: B, D or 8. 4. The position 4, in the serial number means the possibility of the following characters: N or H.
9B3TMC	The last few serial number PT's have seemed to be fainter & fainter when able to restore the digits. It also appears that the digits are not being stamped consistently. In this case, the 4th digit appeared to be connected to the 3rd digit. There was not a way to be able to successfully determine what that digit was. Many work hours were spent on this serial number restoration.
9D9A3V	This sample proved more difficult to examine than normal. It appeared the numbers/letters had been milled out to a deeper level, meaning the residual impressions were lighter in the underlying metal structure and they were quite indistinct. Even though the last digit was a 9 and the only one clear enough to state with certainty, the remainder of the sequence looked to be: The first digit was likely to be either an 8 or a B. The 2nd digit appeared to be a 7. The 3rd and 4th digits were too indistinct to be sure. At different times during the restoration the 3rd digit appeared to be a 4 or J. The 4th digit appeared to be a 5. The 5th digit appeared to be an A. The metal was cleaned of chemical and repolished several times during the restoration in an attempt to provide a clearer sequence, without success.
9E6RY6	Reagents, in order of use, used in Acid Etch Methods Aqua Regia ~2m cont'd Acidic Ferric Chloride ~2m Nitric Acid ~1m Aqua Regia ~2m Aqua Regia ~1m Pot Metal I ~1m Turner's Reagent ~1m Turner's Reagent ~2m Davis' Reagent ~2m Aqua Regia ~2m Aqua Regia ~1m Nitric Acid ~30s Davis's Reagent ~1m Fry's Reagent ~30s Fort's Reagent ~30s Aqua Regia ~2m Turner's Reagent ~2m Hydrochloric Acid ~2m Aqua Regia ~1m Aqua Regia ~2m Fort's Reagent ~30s Nitric Acid ~30s Aluminum Reagent ~2m Davis' Reagent ~4m Aluminum Reagent ~2m [Participant created a manually formatted table within the freeform text space that was not transferable to the final report. Data is presented as is.]
9JETHM	No additional comments.
9UG7F3	This test took longer to develop than prior tests. The metal type, depth of stamping along with the grinding could have been different in years past. The 1st digit was stamped further to the left this time, therefore I had to re-sand/polish on the left.
9WK2Y6	The first character could be a B, 6, or 8. The last character could be a 9.
9XYHZZ	The characters appeared bloated from the start (after minimal polishing to prep the surface) and remained somewhat unclear throughout the process. The first character appeared ambiguous at times and there is no serial number structure guide to determine if it should be an alpha or numeric character. The first character appeared mostly as "8", but I could not rule out "B" due to the unclear and bloated nature of the characters.
9Y9DYB	In the opinion of this examiner, the characters were "bloated" and overlapping to a point. The possible causes are felt to be the stampings were too close together, the milling tool was dull causing undo stress on the stamping area or the stamps, particularly the 4th character, were worn down causing too wide a dispersal of the pressure to the deformed crystalline structure below the stamping.

TABLE 5

WebCode	Additional Comments
AMEJ28	This was a difficult restoration, specifically some characters were spaced close together making identification harder.
AMTZ3R	Item 1 photographed and then surface levelled and polished using fine file and crocus paper. Magnetic particle restoration attempted using magnetic yolk. Etching with Dilute 10% HCl & heat. Magnetic particle repeated using horseshoe magnet. Etching repeated with the following preparations in conjunction with heat: Fry's reagent, 90g CuCl ₂ , 120ml Conc (32%) HCl, 100ml Distilled Water, Griffin's reagent, 30g CuCl ₂ , 30ml Conc (32%) HCl, 30ml Distilled water, 120ml Methanol
APY9LK	The similar and small shape of some of the characters makes it difficult to make a differentiation between: K, H; N.
AQRCXR	I received one magnetic unknown sample block and one stamped standard block. The unknown block had repeating circular machining marks in the middle section. Stereomicroscopic examination did not reveal any unknown characters. Mechanical polishing with a Dremel tool and subsequent stereomicroscopic examination did not reveal any unknown characters. Fry's, Davis, and Turners reagents were used in chemical etching (all turned brown) to reveal: 8****9. With no external indicators of orientation, the serial number could also be: 6****8. Criminalist [Name] seconded this result on 3-3-21. Other possible characters noted during processing were: 8 7 C/E 5 4 9. Only the first and last characters came through clearly with processing; the middle four were never clear enough to be certain what they were. This is different than in years past where I have been able to see all of the characters clearly.
ATYJGK	The development of the piece of metal starts with MagnaFlux, however the characters are not clear. The chemical method is used using hydrochloric acid, alternating nitric acid. At the end, Fry is used to better visualize the characters. The piece of metal was ferrous but in my opinion in a low percentage. In addition, the method of wear leaves a mark; which makes the development even more difficult.
AUD6T8	This is not the first test that resulted in a less than desirable outcome. All procedures were used appropriately, which gives good results in real casework, yet the target answer could not be obtained. Over the past couple of years the tests have become more and more difficult to the point of not being able to fully restore the numbers. This could be due to the process of the character removal.
B4UC3G	The bar stock was rinsed with water, dried, and oiled after restoration.
BAKLDE	The answer sheet states that the provided Aluminum standard contained alphanumeric characters that are intended to be used as a reference for the size, shape, and position of the characters used in the serial number. Only numbers and letters on the provided Aluminum Standard were considered as possible characters for the serial number on Item 1.
BVZ4KB	First and last characters where clearly distinguished, but the rest presented many doubts.
C6HZZ3	The restoration of this serial number took days and the characters observed were barely visible. It was extremely challenging. New reagents were even made to see if it would help, which it didn't.

TABLE 5

WebCode	Additional Comments
C7F9DR	This serial number restoration was riddled with issues including: the depth of the milling marks, specifically over the erased number and at the edges of the milled section interfering with the interpretation of the recovered characters. The milled section was off-centre resulting in the final character being located in the sharp angled edge between the milled and non-milled section. Despite used a stepped or phased approach to the metal preparation at no stage did any of the characters resolve cleanly. They always appeared soft and blurry. This stage approach involved removing a small layer of metal by abrasive means and polishing to remove the worst of the milling marks prior to application of Fry's. This removal, restoration process was attempted multiple times until the characters started to become softer/less distinct. The fourth character appeared to be too closely over stamped to the third character resulting in a merging of the two characters under recovery making it impossible to interpret.
CC7MV8	The material used for standard was made from aluminum. The questioned sample was made from stainless steel. These two material do not mark in the same fashion, so clearly delineating between similar character samples was made difficult.
DACCHK	Test was somewhat difficult. Border line on milling too deep for recovery. Standard for what numbers and alphas look like but, no standard on sequence of digits. Serial number restoration guide gives an idea to order and style and what to expect on a firearm.
DKHW6L	Without a serial number structure guide, or a reference, the first character could not be differentiated between the number 8 and the letter B.
DTN2VH	Aluminum standard was received with this case. No examination was requested or performed on the aluminum standard.
E6UJX6	THE TEST BAR OF 303 STAINLESS STEEL REACT LIKE PARTIAL FERROMAGNETIC - THATS WAY WE START N D T METHOD (MPI) FIRST.
EDR9E9	?(B,8) 7 J ?(H,N) A 9 was observed after the use of Fry's Reagent and 25% Nitric Acid. With the addition of Turner's Reagent, characters observed were the same. After the addition of Davis Reagent the characters 87JHA9 were observed. Side-by-side close-up images of the aluminum standard and the restored characters were compared to each other to verify the restored serial number as 87JHA9.
F9CZQA	During restoration, it became apparent the serial number was located close to the left edge of the obliterated area, which also had a shoulder only present on that side. This location prevented a clear restoration and visualization of the left side of the first character.
FBZCPE	upon analysis, the original serial number was quite dull and confuse to restored back.
FNPCJ3	The first character appeared as both a "B" and an "8" during processing. The third character was most consistent with a "J" but restoration attempts were not clear enough to report.
FYPYBY	The submitted item(s) will be transferred to Crime Laboratory Analyst Supervisor [Name]. Questions regarding this report should be addressed to: [Email].
G766KB	The final restoration yielded a N or H where the ? is denoted. During initial processing using MPI the following characters appeared: B or 8 (position 1), 2 or 7 (position 2), 3 or 8 (position 3), 5 (position 4), A or 4 (position 5, 9 or 8 (position 6). During the chemical etching process, different characters were resolved in some positions than seen using MPI.

TABLE 5

WebCode	Additional Comments
GEZX2H	My sample seemed to be milled quite deeply as received (approximately twice the depth of many CTS serial number PT's I've worked previously). Given this, my surface preparation was very limited. Despite the cautiousness, during processing it appeared the stamped number had been obliterated to the edge of disturbance. Even with a lot of time and effort only a couple of the characters could be resolved with excellent legibility. Some characters were only partially restored, but could be logically determined from the provided font. At least this particular bar stock was extremely resistant to etching, which did permit for a very lengthy processing time. Once completed the difficulty and unsuccessful restoration of this test was discussed with my Tech Leader, who shared others in the section obtained similar (incomplete) results and also felt this was a frustrating experience. VERY disappointed in the quality and design of this particular test! I certainly hope we never see a repeat of this, and you strive to provide a better product in the future.
GVG7U7	1st digit was unclear using Magnaflux. Fry's reagent subsequently applied and confirmed the serial number.
GZZ2WX	Item 1 was not marked with the orientation of serial number placement by the manufacturer. In case work, examples from the laboratory reference collection can be used to assist in the determination of serial number placement and correct orientation. Chemical restoration of Item 1 revealed partial characters which were faint and indistinct. Multiple combinations of characters could be visualized by flipping the bar 180 degrees. Due to the quality of the partially restored characters and inability to positively determine the orientation of the obliterated numbers, the characters were not interpreted. Photographs were taken to document the restoration of Item 1 at the following intervals: prior to polish, after polish, after 5 min Fry's, after 10 min Fry's, after 15 min Fry's, after 20 min Fry's, after 25 min Fry's, after 30 min Fry's, after 35 min Fry's, after 40 min Fry's, after 45 min Fry's, after 60 min Fry's, after 70 min Fry's.
H23J9Y	Proficiency test was much more difficult this year than prior years. I expect it to be challenging, but this was a bit more than just challenging
H2MYN2	5 out of 6 recovered
HAKPDH	The application of the reagent was done using a cotton tip applicator and the etching solution was rubbed across the metal surface. This process was conducted for 2.5-3 hours.
HBVPAD	Initial application of Fry's reagent revealed 4 of 6 characters which were legible (B7*#A9). Two partial characters in the third and fourth position, marked *,#, were apparent and illegible. Subsequent applications of Davis reagent enhanced already visible characters and did not enhance the third/fourth illegible characters. Final application of Davis presented visible pitting on the surface of Exhibit 1 with the detail of previously revealed characters reduced. A final application of Fry's reagent darkened the illegible third character presenting a possible 3 or J and the fourth character as a 5 or K. The surface of Exhibit 1 became pitted with additional damage to the previously revealed characters. The restoration attempt was discontinued at this point.
HDGH38	All of the listed process reagents, including MPI, were used at various points of processing and in various combinations with each other.
HK49N3	The quality of this test was poor. The characters were only visible as thick empty space surrounded by a darker halo. This made reading the visible characters that are similar shapes to other characters difficult to distinguish/identify.

TABLE 5

WebCode	Additional Comments
HMAMEG	Metal was very pitted
HPAYR9	Applied listed chemicals numerous times over 3 hours. Fry's reagent was most successful in raising the obliterated serial number. First two digits raised well, while the middle three were extremely difficult to raise.
J3DKUX	First character started out with what appeared to be a straight spine, but magnaflux was not able to resolve the character (only the second character, 7, appeared clearly here). After sanding and magnaflux, chemical techniques were used and the characters became hazy and fuzzy. The straight spine eventually morphed to having a curved look, thus B or 8 conclusion.
J7DWPX	Magnaflux did not work well with this sample. It was used multiple times throughout the test, and it did not reveal any characters definitively until the last time where it revealed the A. Etching acid solutions were the main method used for restoration. The Davis reagent was used first to gauge how the metal would react. There was a reaction but not a particularly strong reaction. Then Turner's Reagent was used and there was a stronger reaction with the sample than the Davis reagent. With time, all six characters started to appear with the second character (7) appearing more clearly than the rest. With further use of Turner's reagent, the first character continued to develop and appeared to be either a B or an 8. The third and fourth characters appeared but with little definition. The fifth character continued to develop and appeared to be an A. The sixth character continued to develop as well and appeared to be a 9. Then, magnaflux was used and the fifth character was confirmed to be an "A". Turner's reagent was used once more, but the characters did not develop any further and started to decline in definition. Conclusions: The first character could not be determined definitively, it appeared to be a "B" or an "8". The second character was developed with Turner's reagent and was confirmed to be a "7". The third and fourth character did not fully develop. The third character resembled a "J" or a "3" and the forth character resembled an "H" or an "N". Between these two characters was an odd shape that could not be determined. This could have been damage or a character not fully developed. Whatever the case, this led to the conclusion that the third and fourth characters could not be fully restored. The sixth character appeared to be a "9" but could not be restored completely.
JAUEQF	Due to the lack of a serial number structure guide, the first character was not conclusively determined to be an alpha or a numeric, though it consistently appeared 'B'-like.
KY9C3T	After smoothening the surface softly with sand paper we rubbed the surface with acid saturated cotton swabs.
L9T33P	The stamping appeared to be done manually. The serial number on weapons are usually stamped mechanically.
LB436C	On 2/4/21 I used a dremel to smooth out the area where the obliterated number was. I processed the area with the chemicals for a total of an hour and a half with no observations. I used the dremel again to smooth the area a little bit more. I processed the area with the chemicals for another hour and a half with no observations. On 2/5/21, I processed the area with chemicals for approximately 3 hours with no observations. On 2/10/21, I processed the area with chemicals for approximately 4.5 hours with observations made and verified.
LFRRJU	The leading character was in the left edge of machining marks, making it difficult to discern between B or 8.

TABLE 5

WebCode	Additional Comments
LJRZM4	This test was particularly challenging and the code was not clear after restoration techniques, including polishing with fine grade sand paper, magnaflux and Fry's reagent. In a report we likely have only stated that a partial number was recovered.
MJRB38	Part of the first character on the obliterated area was covered by a piece of metal (milling machine did not cut all the area) which did not make it possible to conclude if it was an 8 or a B. I would suggest to perform a thoroughly QAQC on all the samples.
NDXLDN	Polished twice in between the reagents. These steps were done numerous times throughout a two day period. The time left on them could have varied, but the reagents were reapplied numerous times.
P7UXYT	Concentrated Fry's Reagent was left on the surface for various time intervals ranging from less than a minute up to approximately 20 minutes. Only partial restoration could be achieved. The fourth character presented the most problem and could not be adequately restored even after multiple chemical processing attempts.
PFZ3PN	Restoration with chemicals was done until the metal started pitting and the clarity of previously restored characters began degrading.
PQL8WN	Restored characters of poor quality with available methods (etching solutions). First character begins at very edge of ground area, which interferes with ability to view entire character.
QL3CUV	Photographs were taken throughout processing.
QZ3BGT	During the restoration, the characters appeared very faint and large/bloated. Some of the characters became slightly clearer as acid was applied. One of the characters was never fully legible.
R2EAC2	Difficulties were encountered with the reaction of the reagents and Magnaflux with the type of metal used to make the test.
R4JQT7	Acids used for etching included Acidic Ferric Chloride, Hydrochloric Acid and Nitric Acid.
R7BP84	Proper orientation of the metal bar could not be determined.
R8LQT3	Please consider adding a serial number structure guide to the next test. Typically when performing a restoration we consult guides to figure out how many characters, and the order of numeric vs alpha characters. This will add in the determination of characters that are similar in shape such as B and 8. If it is known that digit is an alpha, the examiner can confidently state it is a "B".
T34XAM	In the future, the location of the suspected obliteration and the direction would be helpful, as well as the structure of the "serial number". In real casework, the structure could be looked up either by looking at a similar model firearm or by using the ATF Serial Number guide.
TWDNZP	There was no structure guide to assist in determining first letter or number. Grinding edge partially cut off left side of first letter/number.
UAH4JY	The surface was sanded until it was mirror-like. The sequence was available to watch with the MagnaFlux, except for the letters "J" and "N", so for those two, were used the other methods.

TABLE 5

WebCode	Additional Comments
UM74CM	The serial number was not fully recovered. The first character was very near the demarcation between the original metal surface and the obliterate area and seemed to be on a slope. It was very hard to evenly polish the metal in that area and that affected the ability for that character to be restored. The last character appeared to be a "9" but was not clear enough for the verifier to confidently agree. The second to last character appeared to be a "4" or an "A" but again, it was not clear enough for either the primary or the verifier to report this character with confidence. Per our protocol, the primary and the verifier have to agree on what the characters are in order to report the serial number character. Since this agreement did not happen for the first, second to last, and last character, these characters were reported out as a question mark (?).
V6J6LF	The restoration quality of this test was greatly diminished compared to previous tests. Also, the amount of time needed for the restoration was quite a bit longer than previous tests. Seems almost as if the stamping was not as deep, or the obliteration technique used went deeper than prior tests. Was worried that a restoration was not going to be successful.
VFG6YJ	It is difficult to differentiate the character 'B' and '8' due to the way the serial number was stamped on the stainless steel bar stock.
VZTQ4Z	The spacing between the characters appeared to be inconsistent. The last character was on the very edge of the area obliterated, and the 3rd and 4th characters were very close together in comparison to the space between the other characters.
W2XM4U	Serial number was very difficult to raise.
WAAYWL	First and middle two characters were hard to restore and read, with the first character possibly B or 8 and the fourth character N or H. On this particular sample it appears to be B and N or H (poor quality). Results are reported as either B7JNA9 or 87JNA9.
WKTFTP	Fourth Character is possibly an 'N' but could not confirm. Fifth Character appears to be an '8' but could potentially be a '0' and could not confirm.
X3N9AQ	Methods: Serial Number Magnetic, thermal, and chemical methods may be used for the restoration of serial numbers. Conclusions regarding restored characters are made by visual examination of the restored surface under a variety of lighting conditions. Information regarding the alpha-numeric structure or the general location of serial numbers is obtained when necessary from reference sources or from firearms in the Laboratory's Reference Firearms Collection. Limitations: Serial Number With the exception of the magnetic method, serial number restoration is a destructive examination and it is possible that the obtained results may not be reproduced in any subsequent examinations. Restored serial numbers are sometimes only visible during a portion of the reconstruction process, and are not necessarily visible at the conclusion of the process.
X42T32	A second sample was obtained. The same procedure/chemical treatments were applied as well as adding Magna-flux on two occasions during the analysis ending in the same results. The serialized area appeared to have been heavily ground / milled and no characters could be recovered.
X4Z6FV	Some of the alphanumeric characters were very worn, mainly the 3rd and 4th characters, so their restoration was very difficult; these characters were not 100% recognizable.
XPKUXZ	This was a very difficult restoration. T

TABLE 5

WebCode	Additional Comments
XTGNMN	Digital images were captured after recovery of the obliterated serial No.
XVM7UW	Serial Number Restoration PT seem not to be replicating between test. This has been the second round of SNR PTs that have done this from the same source (CTS).
Y7NQU4	Had issues with the sample and did not recover the middle characters at all. Our QA team requested another sample from CTS, which was received and processed. The results listed are for that replacement sample.
Y8VARZ	The test material was significantly resistant to acid/chemical etching, taking a significant amount of time before any potential characters were able to be visualized. Additionally, the method of obliteration appeared very deep with significantly deep grooves. It appears the obliteration of the serial number was in beyond the point of legible restoration in the center of my test. I was only able to make a conclusive determination of the third character because of the provided structure sample, as part of that character never visualized. This test took far longer to work than it should have.
YCBGFY	I would like to see the CTS Serial Number Restoration test have a serial number structure that mimics what is applied on firearms. All numeric characters, 2 alphas followed by 5 numeric characters, etc. The order in which the alpha/numeric characters are applied in these tests is not structures that Firearm manufacturers use. I thought the goal of these tests was to mimic casework and not stamp a mixture of alpha and numeric characters in a random order.
Z4CF9K	The approximate amount of metal milled out for two SNR proficiencies in 2019 were $\sim .010$ " and $\sim .015$ " and for the first 2020 SNR proficiency $\sim .010$ " These seemed to be barely obliterating the actual stamped characters. This bar had $\sim .035$ " milled out of the bar. This definitely made the restoration very difficult to resolve all of the characters. Hopefully in the future, there could be a thickness milled somewhere between $.015$ " and $.035$ "
Z6MDL3	Magnaflux and electro-acid was used alternated.
ZMN6LH	NOTE: Due to the absence of a serial number guide being provided for this test, the participant is unaware of the alpha-numeric character placement and or sequence.

-End of Report-
(Appendix may follow)

Collaborative Testing Services ~ Forensic Testing Program

Test No. 21-5250: Serial Number Restoration

DATA MUST BE SUBMITTED BY **March 22, 2021, 11:59 p.m.** TO BE INCLUDED IN THE REPORT

Participant Code: U1234A

WebCode: AGM4JR

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.

Please Note: A piece of aluminum bar stock labeled as 'Aluminum Standard' was also included in the sample set and is intended as a reference for size, shape and positioning of the stamped alphanumeric characters used in the serial number. Use caution when handling the sample, as there may be sharp areas on the Item 1 bar stock.

Items Submitted (Sample Pack SNR1):

Item 1: A piece of 303 stainless steel bar stock with suspected obliterated serial number.

1.) Please record the restored characters below.

The serial number on this material consists of 6 characters.

Item 1:

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

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.

3.) What methods were used to prepare the sample prior to attempts at recovery?

eg. Sanding, Polishing, Visual, etc. (Please describe in order.)

Method	Tool Used	If sanding was done what grit size was used?
<input type="text"/>	<input type="text"/>	<input type="text"/>

4.) What recovery methods were used during your examination?

eg. Fry's, Acid Etch, MagnaFlux, etc. (Please list in order of use)

Method	If an acidic method was used how long was the acid left on the material?
<input type="text"/>	<input type="text"/>

5.) Additional Comments

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.

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)