



## **Serial Number Restoration**

### **Test No. 22-5250 Summary Report**

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Each participant received a sample pack containing a piece of metal bar stock stamped with a six-character serial number that was then obliterated. An arrow was also stamped to indicate directionality. Also included was a piece of aluminum bar stock intended as a standard for the size, shape, and positioning of the stamped alphanumeric characters. Participants were asked to restore the obliterated serial number and report their findings. Data were returned from 281 participants and are compiled into the following tables:

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

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

# **Manufacturer's Information**

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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 (6C1KF5).

## **SAMPLE PREPARATION:**

Each sample set contained a piece of steel bar stock that was stamped with six characters (6C1KF5), along with an arrow for directionality. The serial number was first obliterated by a milling machine, then a second process of light sanding with a Dremel was performed to ensure full obliteration.

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 steel 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:**

All three of the predistribution laboratories restored the obliterated six-character serial number and reported "6C1KF5." Chemical restoration methods were used by all three predistribution laboratories.

## **Summary Comments**

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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 – 6C1KF5 (Refer to Manufacturer's Information for preparation details).

Of the 281 responding participants in Table 1, 265 (94.3%) were able to restore all six expected characters on the Item 1 bar stock. Sixteen participants gave responses that differed from the consensus of the testing group for one or more characters, and they have been indicated by boxing. Nine of these participants reported a character different from that of the consensus, and the remaining seven participants did not provide an alphanumeric response for one or more characters (e.g. \*, ?).

In Table 3 (Sample Preparation), the majority of participants used sanding, polishing, 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.

# 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
23CFJC	6	C	1	K	F	5
29X2FH	6	C	1	K	F	5
2FGZAW	6	C	1	K	F	5
2L3R7C	6	C	1	K	F	5
2MGZB7	6	C	1	K	F	5
2QGC87	6	C	1	K	F	5
2RT2HV	6	C	1	K	F	5
2T3E9Q	6	C	1	K	F	5
2YC8DG	6	C	1	K	F	5
2YVXHV	6	C	1	K	F	5
2Z7WVC	6	C	1	K	F	5
39BDNU	6	C	1	K	F	5
3AP8JG	6	C	1	K	F	5
3H374T	6	C	1	K	F	5
3JTYTP	?	?	?	?	?	?
3QC3ZR	6	C	1	K	F	5
3VBGNG	6	C	1	K	F	5
3VRZQL	6	C	1	K	F	5
3Z2QXE	6	C	1	K	F	5
499UHJ	6	C	1	K	F	5
4BYLH9	6	C	1	K	F	5
4EY9ZX	6	0	1	K	F	5
4GN28F	6	C	1	K	F	5
4JC32P	6	?	1	?	?	5
4PCLYE	6	C	1	K	F	5
4VLDFJ	6	C	1	K	F	5

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
624ZPF	6	C	1	K	F	5
66MXFQ	6	C	1	K	F	5
68CWMG	6	C	1	K	F	5
6AXBXP	6	C	1	K	F	5
6BBB8L	6	C	1	K	F	5
6FMNYD	6	C	1	K	F	5
6GGYPU	6	C	1	K	F	5
6HB3MM	6	C	1	K	F	5
6LDX9C	6	C	1	K	F	5
6NLHBD	6	C	1	K	F	5
6QLJW9	6	C	1	K	F	5
6VXYFR	6	C	1	K	F	5
6WCT88	6	C	1	K	F	5
72M9CP	6	C	1	K	F	5
7637VR	6	C	1	K	F	5
7AZPYC	6	C	1	K	F	5
7BTLHE	6	C	1	K	F	5
7E7F2H	6	C	1	K	F	5
7ELP6Q	6	C	1	K	F	5
7ERWHK	6	C	1	K	F	5
7GEB7U	6	C	1	K	F	5
7JLU7B	6	C	1	K	F	5
7KH63E	6	C	1	K	F	5
7NCBBP	6	C	1	K	F	5
7NGHMH	6	C	1	K	F	5
7TAKRH	6	C	1	K	F	5
842XZD	6	C	1	K	F	5
8LNBFG	6	C	1	K	F	5

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
8PPMKK	6	C	1	K	F	5
8RDQ8J	6	C	1	K	F	5
8UYDY7	6	C	1	K	F	5
8YC3GU	6	C	1	K	F	5
99BBGC	6	0	1	K	F	5
9HZWRG	6	C	1	K	F	5
9JVPEM	6	C	1	K	F	5
9PKPPE	6	C	1	K	F	5
9V8HW8	6	C	1	K	F	5
9XYC3P	6	C	1	K	F	5
9Z4R3M	6	C	1	K	F	5
9ZZWTP	6	C	1	K	F	5
A28V3N	6	C	1	K	F	5
AHG3D6	6	C / 0	1	K	F	5
AKMXAA	6	C	1	K	F	5
ALXX6J	6	C	1	K	F	5
APHMVM	6	C	1	K	F	5
APXGFB	6	C	1	K	F	5
ATXRCB	6	C	1	K	F	5
AV3HEJ	6	C	1	K	F	5
AZZ9WB	6	C	1	K	F	5
B2KMTK	6	C	1	K	F	5
B33YM4	6	C	1	K	F	5
B7FGQL	6	C	1	K	F	5
B97ZR6	6	C	1	K	F	5
BEW6BF	6	C	1	K	F	5
BKXR93	6	C	1	K	F	5
BLVGLQ	6	C	1	K	F	5

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
BMPDUK	6	C	1	K	F	5
BMPNYG	6	C	1	K	F	5
BTE4PA	6	C	1	K	F	5
BVHQUK	6	C	1	K	F	5
BVWM9H	6	C	1	K	F/E	5
BWV3UB	6	C	1	K	F	5
C3X2TJ	6	C	1	K	F	5
CCLTFC	6	C	1	K	F	5
CCZGG4	6	0	1	K	F	5
CFMV7D	6	C	1	K	F	5
CJ3Y6B	6	C	1	K	F	5
CPQMFM	6	C	1	K	F	5
D3T29A	6	C	1	K	F	5
D7RD4A	6	C	1	K	F	5
D92VEL	6	C	1	K	F	5
D9XZGE	6	C	1	K	F	5
DBQRUK	6	C	1	K	F	5
DFGLUL	6	C	1	K	F	5
DMGV77	6	C	1	K	F	5
DPMDA9	6	C	1	K	F	5
DQXHKB	6	C	1	K	F	5
DRBM22	6	C	1	K	F	5
DREGX9	6	C	1	K	F	5
DTKWAL	6	C	1	K	F	5
E2V9NB	6	C	1	K	F	5
EBZTZY	6	C	1	K	F	5
EE6LAH	6	C	1	K	F	5
EEF8LJ	6	C	1	K	F	5

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
EEJKDM	6	C	1	K	F	5
EG9CK7	6	C	1	K	F	5
EJA2JL	6	C	1	K	F	5
EKK7VN	6	C	1	K	F	5
ELLUKE	6	C	1	K	F	5
EUE33K	6	C	1	K	F	5
EWMM3Y	6	C	1	K	F	5
F8JHPF	6	C	1	K	F	5
FEVWBH	6	C	1	K	F	5
FK7TD7	6	C	1	K	F	5
G4T94Y	6	C	1	K	F	5
GAWH4Y	6	C	1	K	F	5
GB7Y8J	6	C	1	K	E OR F	5
GDZMQF	6	C	1	K	F	5
GREF9W	6	C	1	K	F	5
GVHLVD	6	C	1	K	F	5
HF39BC	6	C	1	K	F	5
HHCQH3	6	C	1	K	F	5
HKF7HY	6	C	1	K	*	5
HKW3AX	6	C	1	K	F	5
HLQJD2	6	C	1	K	F	5
HM4K79	6	C	1	K	F	5
HU3FH9	6	C	1	K	F	5
HXL6Q6	6	C	1	K	F	5
HZ42YB	6	C	1	K	F	5
HZA4VA	6	C	1	K	F	5
HZQR7U	6	C	1	K	F	5
J4N7DY	6	C	1	K	F	5



TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
JD9266	6	C	1	K	F	5
JEN4CD	6	C	1	K	F	5
JJYCF4	6	C	1	K	F	5
JKVP6G	6	C	1	K	F	5
JNEMT8	6	C	1	K	F	5
K2CL8B	6	C	1	K	F	5
K2DPBL	6	C	1	K	F	5
K7BYRF	6	C	1	K	*	5
KAABPZ	6	C	1	K	F	5
KBZAQW	6	C	1	K	F	5
KPLCG4	6	C	1	K	F	5
KW2TWC	6	C	1	K	F	5
KW4R2Y	6	C	1	K	F	5
L37NFC	6	C	1	K	F	5
L9QXE9	6	C	1	K	F	5
LAMWLZ	6	C	1	K	F	5
LCQAA9	6	C	1	K	F	5
LMLF47	6	C	1	K	F	5
LMQTV A	6	C	1	K	F	5
LTG378	6	C	1	K	F	5
LVQH QD	6	C	1	K	F	5
LZ3X9W	6	C	1	K	F	5
M2AR79	6	C	1	K	F	5
M3FR98	6	C	1	K	F	5
M7LKG8	6	C	1	K	F	5
MAHYQV	6	C	1	K	F	5
MC7DE6	6	C	1	K	F	5
MDFF6A	6	C	1	K	F	5

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
MDLZ4U	6	C	1	K	F	5
MHGREC	6	C	1	K	F	5
MRZZKX	6	C	1	K	F	5
MTX2VX	6	C	1	K	F	5
MUMEA8	6	C	1	K	F	5
MZAY4U	6	C	1	K	F	5
MZYVWX	6	C	1	K	F	5
N4L7Y8	6	C	1	K	F	5
N4REB2	6	C	1	K	F	5
N4VBT6	6	C	1	K	F	5
N7AKMG	6	C	1	K	F	5
N7ETZB	6	C	1	K	F	5
NFGDXW	6	C	1	K	F	5
NFKV69	6	C	1	K	F/E	5
NFY9K6	6	C	1	K	F	5
NM6VHZ	6	C	1	K	F	5
NPPFA3	6	C	1	K	F	5
NU6TBP	6	C	1	K	F	5
P2XHBQ	6	C	1	K	F	5
P6KWYZ	6	C	1	K	F	5
PDP4EZ	6	C	1	K	F	5
PGUZFB	6	C	1	K	F	5
PLNRB7	6	C	1	K	F	5
PX3Q3U	6	C	1	K	F	5
PXE3LD	6	C	1	K	F	5
PXJAY8	6	C	1	K	F	5
Q4J2W4	6	C	1	K	F	5
QEKE4V	6	C	1	K	F	5

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
QLGCLR	6	C	1	K	F	5
QMV7FR	6	C	1	K	F	5
QRTMU7	6	C	1	K	F	5
QT2ETU	6	C	1	K	F	5
QTHLWQ	6	C	1	K	F	5
RD93YY	6	C	1	K	F	5
RNMC44	6	C	1	K	F	5
RR62JU	6	C	1	K	F	5
RRK68R	6	C	1	K	F	5
RVQXER	6	C	1	K	F	5
RYHCT2	6	C	1	K	F	5
RZJ38W	6	C	1	K	F	5
T4CJXV	6	G	1	B	F	5
T72PZK	6	C	1	K	F	5
T7XZZT	6	C	1	K	F	B
T7ZXL6	6	C	1	K	F	5
T97DY3	6	C	1	K	F	5
TA4NU7	6	C	1	K	F	5
TD2AH3	6	C	1	K	F	5
TV3CY8	6	C	1	K	F	5
TW9AD2	6	C	1	K	F	5
TY3NV8	6	C	1	K	F	5
U3X7GH	6	C	1	K	F	5
U8VY63	6	C	1	K	F	5
U9ZQQN	6	C	1	K	F	5
UA2JT3	6	C	1	K	F	5
UARTD4	6	C	1	K	F	5
UAV767	6	C	1	K	F	5

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
UAVFQB	6	C	1	K	F	5
UBAXV2	6	C	1	K	F	5
UGCCQW	6	C	1	K	F	5
UM6WY2	6	C	1	K	F	5
UULVNQ	6	C	1	K	F	5
UWWCN6	6	C	1	K	F	5
V83WBV	6	C	1	K	F	5
V8LJ8R	6	C	1	K	F	5
V92B93	6	C	1	K	F	5
VE6GJY	6	C	1	K	F	5
VEK4AM	6	C	1	K	F	5
VEPX2L	6	C	1	K	F	5
VGC7XN	6	C	1	K	F	5
VGDYWV	6	C	1	K	F	5
VR8FGQ	6	C	1	K	F	5
VR9A43	6	C	1	K	F	5
W9EW64	6	C	1	K	F	5
WFU83H	6	C	1	K	F	5
WHHERL	6	C	1	K	?	5
WKLNN4	6	C	1	K	F	5
WKQJDN	6	C	1	K	F	5
WPHYUG	6	C	1	K	F	5
WT4D9X	6	C	1	K	F	5
X2T6AW	6	C	1	K	F	5
X343PY	6	C	1	K	F	5
X9THGR	6	C	1	K	F	5
XANTYT	6	C	1	K	F	5
XCWDZU	6	C	1	K	F	5

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
XG8W9F	6	C	1	K	F	5
XGND2N	6	C	1	K	F	5
XJBRPX	6	C	1	K	F	5
XUQDMK	6	C	1	K	F	5
XV7BJQ	6	C	1	K	F	5
XX7C7L	6	C	1	K	F	5
XY4UJ4	6	C	1	K	F	5
XZFN2P	6	C	1	K	F	5
XZYGR2	6	C	1	K	F	5
Y28C7H	*	*	1	?	?	?
Y2MXCD	6	C	1	K	F	5
Y8URNH	6	C	1	K	F	5
YA2KPN	6	C	1	K	F	5
YERN9Y	6	C	1	K	F	5
YLUQDZ	6	C	1	K	F	5
YMNRLP	6	C	1	K	F	5
YV6TYZ	6	C	1	K	F	5
YVGUGT	6	C	1	K	F	5
YVXX38	6	C	1	K	F	5
YZRR3U	6	C	1	K	F	5
Z2HC76	6	C	1	K	F	5
Z3DGUQ	6	C	1	K	F	5
Z8NCWF	6	?	1	K	?	5
Z96GJL	6	C	1	K	F	5
ZAUXW	6	C	1	K	F	5
ZC6RFL	6	C	1	K	F	5
ZDU7TW	6	C	1	K	F	5
ZGX9UE	6	C	1	K	F	5

TABLE 1

<b>Recovered Characters</b>						
<b>WebCode</b>	<b>Character 1</b>	<b>Character 2</b>	<b>Character 3</b>	<b>Character 4</b>	<b>Character 5</b>	<b>Character 6</b>
ZTFRH	6	C	1	K	F	5
ZWTQNH	6	C	1	K	F	5
ZYF6CT	6	C	1	K	F	5

  

<b>Response Summary</b>						<b>Participants: 281</b>
	<b>Character 1</b>	<b>Character 2</b>	<b>Character 3</b>	<b>Character 4</b>	<b>Character 5</b>	<b>Character 6</b>
Consensus	6	C	1	K	F	5
Number	279	272	280	277	271	278
Percent	99.3%	96.8%	99.6%	98.6%	96.4%	98.9%

# Conclusions

## TABLE 2

WebCode	Conclusions
23CFJC	I found filing marks on the metal plate 'Item 1'. Upon electrochemical treatment on the filed surface, the number '6C1KF5' was restored. therefore, I am of the opinion that the obliterated serial number is '6C1KF5'.
29X2FH	1). Examination of Exhibit 1 revealed a piece of metal with an obliterated area. Standard serial number restoration techniques were used and the following characters were observed: 6 C 1 K F 5.
2FGZAW	The serial number had been erased. I was able to restore the serial number to read 6C1KF5.
2L3R7C	The steel bar received had an area of obliteration. After electrochemical process, the new set of number was developed to be read as "6C1KF5". "6C1KF5" could be the original number of the steel bar.
2MGZB7	Using magnetic and chemical methods, the obliterated serial number on Item 001 was fully restored to read 6C1KF5.
2QGC87	Using chemical methods, the obliterated serial number located on the Item 001 steel bar stock, was restored to read 6C1KF5. Item 002 was inventoried and photographed.
2RT2HV	The serial number on Item 1 was restored to read 6 C 1 K F 5 using chemical etching techniques.
2T3E9Q	The serial number on the Item 1 bar stock was restored to 6C1KF5.
2YC8DG	It is observed that the piece of metal showed wear and/or alteration where the series was indicated, which could be recovered through the development process. After applying the development process, the 6C1KF5 sequence was revealed. It should be noted that the features revealed by this process are not permanently recovered and wear persists on the surface. (*).
2YVXHV	The piece of metal analyzed is completely identified despite the alterations detected.
2Z7VVC	On the examination, I found that there were filing mark on the steel bar stock and no numbers were observed. Upon electrochemical treatment on the filed surface, a set of number read as "6C1KF5" was restored. Hence, I am of the opinion that, the original number of the steel bar stock were filed and was restored back read as "6C1KF5".
39BDNU	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 6C1KF5. The procedure was photographed and documented accordingly.
3AP8JG	The defaced serial number on the piece of rolled steel bar stock (item 1) was restored to read "6C1KF5".
3H374T	Exhibit 1 (Item 1) One steel bar stock with an obliterated serial number. The serial number was chemically restored to be 6C1KF5.
3JTYTP	Item 1-1-1 was determined to be a piece of ferrous metal with an obliterated area. The obliterated area was processed with standard serial number restoration chemical techniques. The serial number was not restored.
3QC3ZR	An apparent number had been removed from the item 1 steel plate. An attempt was made to restore the number. The following number was restored: 6C1KF5.
3VBGNG	Using magnetic and chemical restoration methods, the obliterated serial number on the piece of bar stock (item 1) was restored to read 6 C 1 K F 5.
3VRZQL	The serial number on Item 01-01 was recovered to read: 6C1KF5.
3Z2QXE	AFTER USE OF OUR STANDARD PROCEDURES FOR OBLITERATED SERIAL NUMBER RESTORATION WE FOUND THE FOLLOWING NUMBER (LEFT TO RIGHT) 6C1KF5.

TABLE 2

WebCode	Conclusions
499UHH	The metal bar (item 1) shows wear and/or alteration. The 6C1KF5 sequence was revealed. It is important to mention that the characteristics revealed by this process are not permanently recovered and wear persists on the surface.
4BYLH9	Examination of the submitted cold rolled steel bar stock found the manufacturer's serial number to have been obliterated. The obliterated, original serial number was restored to read "6C1KF5".
4EY9ZX	On the basis of the observations made during the investigation, it can be said, that the sample piece 22-5250 originally was marked with: 601KF5.
4GN28F	Item 1-1 A piece of cold rolled steel bar stock with suspected obliterated serial number: Visual examination of this item revealed the presence of polish marks on one side of the bar stock. This area was magnetically processed and etched with acid solutions, and the following was restored: 6 C 1 K F 5.
4JC32P	A serial number restoration was attempted on the Item 1 cold rolled steel bar stock using chemical etching techniques and magnetic particle inspection. The serial number was partially restored to read 6?1??5. The second character is possibly a C or a 6. The fourth and fifth characters could not be restored. The Item 1 aluminum standard bar stock was used for reference purposes.
4PCLYE	Interpretation: The piece of metal shows wear in its middle part. After the analysis, the sequence consistent with the characteristics evaluated in the comparative material was revealed. The detected alteration may still be perceptible after the analyzes carried out. In short: The piece of metal analyzed is completely identified despite the alterations detected.
4VLDFJ	The area of obliteration was polished then processed with both MagnaFlux and chemical etchants. The obliterated serial number was fully restored to read: 6C1KF5.
624ZPF	Visual examination and chemical treatment of the serial number area of the bar stock, Item 1, reveal the following number: 6C1KF5.
66MXFQ	Visual examination with mechanical and chemical processing of the cold rolled steel bar stock (Item 1) revealed the obliterated serial number to read: 6C1KF5.
68CWMG	The restoration revealed the following characters: 6 C 1 K F 5.
6AXBXP	Chemical restoration revealed the serial number to be: 6C1KF5.
6BBB8L	ONE BLOCK OF SILVER FERROUS METAL MEASURING APPROXIMATELY 2 5/8" LONG X 1" WIDE X 1/4" THICK DISPLAYING A 1" X 1" AREA MILLED AWAY. SERIAL NUMBER 6C1KF5 RECOVERED WITH CHEMICAL ETCHING. 22-5250A ETCHED ON BACK FOR IDENTIFICATION.
6FMNYD	Item 1: The serial number on the steel bar stock was chemically restored and appeared to read as: 6C1KF5.
6GGYPU	Evidence Received: Item #1: 1 Piece of cold rolled steel bar with suspected obliterated serial number. Serial Number Restoration: A serial number restoration was conducted on the above described item with the following results. The obliterated serial number was restored to read: 6C1KF5.
6HB3MM	Using standard laboratory techniques, the Item 1 obliterated serial number was restored to read: 6C1KF5.
6LDX9C	Examination of the submitted cold rolled steel bar stock found that the serial number was obliterated. Physical and chemical processing of the submitted cold rolled steel bar stock restored the serial number to read 6C1KF5.
6NLHBD	Serial number restoration techniques were applied to the submitted bar stock (Item 1). The serial number was determined to be 6C1KF5.
6QLJW9	Physical and magnetic processing restored the original serial number to read "6C1KF5".
6VXYFR	I examined and chemically processed Item 1 and I determined the obliterated serial number to be "6C1KF5".



TABLE 2

WebCode	Conclusions
6WCT88	Examination of the submitted cold rolled steel bar stock found the manufacturer's serial number to have been obliterated. The obliterated, original serial number was restored to read "6C1KF5".
72M9CP	Exhibit 1 was processed with serial number restoration techniques and the following was developed in the obliterated section: "6C1KF5".
7637VR	Bar stock (1) was physically and chemically processed. Its serial number was restored to read: 6C1KF5.
7AZPYC	Serial number restoration techniques were applied to Item 1 (flat silver bar stock). The serial number was determined to be 6C1KF5.
7BTLHE	Observation to the piece of cold rolled steel bar labeled as ITEM1, allowed to confirm an obliterated area where fabricant usually marks the serial number, wich was recovered and enhaced to be read as 6C1KF5 . It is important to note that, alphanumeric characters are not restored permanently and obliterated area is still present after analysis.
7E7F2H	The defaced serial number of the steel bar, Item 1, was physically, magnetically and chemically processed to read: 6 C 1 K F 5.
7ELP6Q	Fully restored to read 6C1KF5.
7ERWHK	The obliterated serial number has been restored by using sanding paper and an acid etcht method (Fry & Wazau).
7GEB7U	The serial number was restored to read 6C1KF5 using chemical etching techniques.
7JLU7B	The obliterated number on Item 1 was restored and interpreted as 6C1KF5.
7KH63E	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: 6 C 1 K F 5 was restored on Item 1.
7NCBBP	A six digit alphanumeric serial number was successfully restored by chemical treatment to read: 6 C 1 K F R 5.
7NGHMH	Item #01.01: The item is a standard sample set block. Item #01.02: The item is bar stock with a suspected obliterated serial number. Laboratory chemical restoration procedures revealed the following serial number: 6C1KF5. The evidence will be held in the Proficiency Test Long Term Storage.
7TAKRH	The serial number on the metal plate (Exhibit 01) was mechanically and chemically treated and restored to read 6C1KF5. The stamped metal plate (Exhibit 02) was documented and photographed; however, no further analysis was performed.
842XZD	it was observed that the piece of metal was altered and its serial was obliterated. Through the process restoration it was recovered the serial 6C1KF5.
8LNBFAQ	Attempts to restore the obliterated serial number of the steel bar stock using polishing and chemical etching methods were successful. The serial number is 6C1KF5.
8PPMKK	The serial number is milled off. The serial number (6C1KF5) was restored by acid etching. 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 the metal plate.
8RDQ8J	One (1) Stainless steel bar stock 2-1/2" length, 1" width. Spiral abrasion on bar with suspected obliterated serial number. Conclusion; Serial number restored using chemical etching process. Reads "6C1KF5". CTS #20-5250B scribed on back of bar stock by examiner for identification purposes.
8UYDY7	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 6C1KF5. Hence, i am of the opinion that the number of the steel bar was tempered and the original number was 6C1KF5.
8YC3GU	The obliterated number on Item 1 was polished and chemically restored to reveal the serial number 6C1KF5 .

TABLE 2

WebCode	Conclusions
99BBGC	Fifth character probable 'F' or 'E'.
9HZWRG	Serial number restoration techniques were applied to Item #1A (block of metal). The serial number was determined to be 6C1KF5.
9JVPEM	The alphanumeric sequence of the piece was determined to be altered. After the analysis, the sequence consistent with the characteristics evaluated in the comparative material was revealed. The detected alteration may still be perceptible after the analyzes carried out.
9PKPPE	The defaced serial number from Item 001-01 was able to be successfully restored. The restored serial number is: 6C1KF5.
9V8HW8	The serial number was restored to read 6 C 1 K F 5.
9XYC3P	I chemically treated the surface of the metal bar stock that was listed as item 1. As a result, I recovered the previously stamped characters '6C1KF5'. These characters were consistent in size and style to the characters provided on the Aluminium Standard.
9Z4R3M	[No Conclusions Reported.]
9ZZWTP	[No Conclusions Reported.]
A28V3N	Using a combination of mechanical and chemical restoration techniques, the obliterated serial number on the steel bar stock (Item 1) was restored to read: 6 C 1 K F 5.
AHG3D6	The serial number was partially chemically restored to read: 6 ? 1 K F 5. The second character could be a C or a 0.
AKMXAA	[No Conclusions Reported.]
ALXX6J	I found filing marks on the steel bar 'Item 1'. Upon electrochemical treatment on the filed surface the number '6C1KF5' was restored. Therefore, I am of the opinion that the obliterated serial number is 6C1KF5.
APHMVM	Based on the above examination and finding, I am of the opinion that the original serial number on a piece of steel bar stock labelled with 'Item 1' is 6C1KF5.
APXGFB	1). Exhibit 1 consists of a ferromagnetic metal bar containing an obliterated area. 2). Standard restoration techniques were used and the following characters were observed: 6 C 1 K F 5.
ATXRCB	1). Exhibit 1 consists of one ferromagnetic piece of bar stock with an obliterated area. 2). Standard restoration techniques were performed on Exhibit 1 and the following characters were observed on the obliterated area: 6 C 1 K F 5.
AV3HEJ	The serial number of the rolled steel bar submitted as Item 1 was restored and determined to be 6C1KF5.
AZZ9WB	I was able the restore the characters "6 C 1 K F 5" on the submitted sample.
B2KMTK	The surface in the metal piece was determined obliterated. After the analysis an alphanumeric sequence was revealed concordant with the characteristics evaluated in the comparative material.
B33YM4	Item 1 exhibited an area of obliteration. Chemical and mechanical restoration techniques were applied and the serial number was recovered to be 6C1KF5. The aluminum standard was not examined.
B7FGQL	The obliterated serial number was fully restored to read 6 C 1 K F 5 using sand paper, Fry's reagent, and photography.
B97ZR6	The serial number was successfully restored to read 6C1KF5.
BEW6BF	The piece of cold rolled steel bar stock was physically and chemically processed. Its serial number was restored to read: 6C1KF5.
BKXR93	The item was chemically processed and the following serial number was restored: 6C1KF5.

TABLE 2

WebCode	Conclusions
BLVGLQ	Upon electrochemical treatment on the filed surface, the number 6 C 1 K F 5 was restored. Based on my findings, I am opinion that 6 C 1 K F 5 was the original number stamped on the surface that was previously obliterated.
BMPDUK	Steel plate (Item #1) was physically/chemically/magnetically processed. Its serial number was restored to read: 6C1KF5.
BMPNYG	Visual examination, polishing, and chemical treatment restored the obliterated serial number on Item 1 to read "6C1KF5."
BTE4PA	Item 1 was examined and found to have an obliterated serial number. Standard restoration techniques were applied to Item 1. The following characters were restored: 6C1KF5. Multiple factors could have had an effect on the interpretation of the restored characters.
BVHQUK	The restauration techniques applied allowed to identify the previously obliterated serial number " 6 C 1 K F 5".
BWM9H	EVIDENCE SUBMITTED: Lab Item #, Agency Item #. Description: 1 SNR1: One (1) piece of cold rolled steel bar stock with obliterated serial number and one (1) aluminum standard. CONCLUSIONS OF ANALYSIS: The serial number on the piece of cold rolled steel bar stock, item 1, was partially restored to read 6C1K*5, with the "*" being either an F or an E.
BWW3UB	The alphanumeric sequence revealed in the piece of cold rolled steel bar identified as E1-22-0719 (Test No. 22-5250 Item 1) corresponds to "6C1KF5".
C3X2TJ	Using standard laboratory physical and magnetic restoration techniques, the obliterated serial number on Item 1 was restored to read 6C1KF5.
CCLTFC	Item 1 is one (1) piece of bar stock with a suspected obliterated serial number. The obliterated serial number on Item 1 was restored to read 6C1KF5 using the Magnaflux and chemical etching processes.
CCZGG4	The serial number was restored to read 601KF5.
CFMV7D	The Item 1 obliterated serial number, located in the center section of the metal bar, was chemically processed and determined to be 6C1KF5.
CJ3Y6B	One metal bar stock, having magnetic properties, with a serial number obliterated by apparent abrasion. Chemical restoration and magnetic particle inspection resulted in the full recovery of characters "6C1KF5".
CPQMFM	The serial number of Item 1 was restored as 6C1KF5.
D3T29A	The serial number is milled off. The serial number 6C1KF5 was restored by acid etching. Polishing, Magnaflux, 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.
D7RD4A	The serial number is ground and milled off. The serial number (6C1KF5) was restored by acid etching. Sanding, polishing, modified Fry's and nitric acid reagents were used for the restoration. A chemical reaction was observed when the acid etching solution was applied to the surface area of Item 1. Disposition: Item 1 will be held in the Firearms Evidence Room.
D92VEL	The following evidence was received, analyzed on the below listed date and marked for identification as follows: Item 1: One piece of cold rolled steel bar stock with suspected obliterated serial number marked Q1. Also received was one piece of aluminum bar stock labeled as "Aluminum Standard" for reference, not marked. The analysis of the above evidence was initiated on March 21, 2022. The evidence bar stock was visually examined. Q1 was found to be magnetic. The serial number restoration process utilized initial polishing for surface preparation with a dremel tool and the application of chemical etching solutions. This process restored the serial number to read: 6C1KF5.

TABLE 2

WebCode	Conclusions
D9XZGE	The serial number of Item 001 was mechanically and chemically processed and restored to read "6C1KF5". This is also the opinion of Firearms Examiner [Name].
DBQRUK	The serial number had been erased. It was restored and read as 6C1KG5.
DFGLUL	The restored series is 6C1KF5.
DMGV77	The piece of metal identified internally in the Ballistics Unit as E1-22-0726 (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: "6C1KF5".
DPMDA9	The obliterated serial number of Item 1 was restored to read 6C1KF5.
DQXHKB	Serial number restoration techniques were applied to Item 1-2 (aluminum bar). The serial number was determined to be 6C1KF5.
DRBM22	The six-digit serial number was restored to read: 6 C 1 K F 5.
DREGX9	Steel bar identified as Item 1 has an obliterated area. By restoration process the alphanumeric sequence 6C1KF5 was recovered.
DTKWAL	The stainless steel bar stock and the aluminum standard were visually examined. Attempts to restore the serial number of Item 1 using a Dremel tool, magnetic methods, and chemical processing were successful. The restored serial number is 6C1KF5.
E2V9NB	The submitted specimen marked as Item 1 was examined and identified as one (1) piece of metal bar stock with a suspected obliterated serial number. The obliterated serial number, located on the mid-section of the metal bar stock, was chemically processed and restored to read "6C1KF5".
EBZTZY	upon analysis, i am opion the obliterated serial number on cold rolled steel was restored and intepreted as "6C1KF5".
EE6LAH	The serial number had been erased. I restored it to read 6C1KF5.
EEF8LJ	the chemical restoration of the characters that had been altered by milling was positive and the result is: 6C1KF5.
EEJKDM	Serial number restoration was performed on item 1.1. The serial number 6C1KF5, was restored on item 1.1.
EG9CK7	The serial number on the cold rolled steel bar stock (Item 01-01) was fully restored to read 6C1KF5.
EJA2JL	Evidence Received: Item 1: one (1) rectangular piece of metal, serial number obliterated Item 2: one (1) rectangular piece of metal, serial number 1234567890 ABCDEFHJKN Results/Conclusions: Examination and processing of the one (1) rectangular piece of metal, item 1, recovered the serial number that was determined to be 6C1KF5. The one (1) rectangular piece of metal, Item 2, was documented but not analyzed. Digital images were taken of all items of evidence and will be on file in the Crime Lab.
EKK7VN	The serial number was revealed in accordance with the methodolgy at the LPS59 laboratory. After a polishing of the metal surface, a combinason of two acid reagents where used until the restoration of the number.
ELLUKE	The serial number on the Item 1 piece of steel bar stock was restored and determined to be 6C1KF5.
EUE33K	The analysis was initiated on January 25, 202 and the results of the physical and chemical restoration processes are as follows: The serial number on the cold rolled steel bar stock (Item 1) was restored to read 6C1KF5.
EWMM3Y	The obliterated serial number on item 1 was chemically processed and restored to read: "6C1KF5".
F8JHPF	Examination and restoration of the obliterated area on Item 1 (steel bar stock) revealed the following characters interpreted as "6C1KF5".

TABLE 2

WebCode	Conclusions
FEVWBH	Using standard restoration techniques, the obliterated serial number on item 1 (bar stock) was restored to read: 6 C 1 K F 5.
FK7TD7	The restoration revealed the following characters: 6 C 1 K F 5.
G4T94Y	The serial number was successfully restored to read 6C1KF5.
GAWH4Y	The serial number that was restored is interpreted to 6C1KF5. The fifth character was the hardest to restore but the F seemed more likely overall.
GB7Y8J	Examination and restoration of the obliterated area on the steel bar stock of Item 1 revealed the following characters: "6C1K*5". The * represents an E or F.
GDZMQF	[No Conclusions Reported.]
GREF9W	A serial number restoration was performed on this item. Based upon the information provided by CTS, the expected serial number consists of 6 characters. The serial number was fully restored and appeared to be 6C1KF5.
GVHLVD	The above number was obliterated through mechanically obliterated of metal surface from serial number field.
HF39BC	The obliterated serial number on the steel bar stock, item 1, was restored to 6C1KF5. The steel bar stock, item 1, was examined. The location of the suspected obliterated serial number, the middle of the bar stock, was obliterated by a grinding type of tool. Using standard restoration techniques, the obliterated area was sanded and treated with magnetic inspection particles and chemicals.
HHCQH3	Items 1 (alloy steel bar) and Item 2 (Aluminum standard) were photographed. The obliterated area of item 1 was sanded with 400 and 1500 grit sandpaper and treated with Fry's chemical reagent, for a total of three times. After each treatment photographs were taken. After the third treatment the alpha-numeric combination was observed (6C1KF5). The alpha-numeric combination was photographed and viewed in Adobe.
HKF7HY	An area of obliteration was observed and photographed on the steel plate next to a visible arrow. The obliteration consisted of multiple markings which may indicate abrasion, polishing and/or milling. The obliterated area was sanded, and Magnetic Particle Inspection (MPI) was performed followed by chemical etching. A serial number of 6C1K*5 was restored where the * represents either an "E" or an "F".
HKW3AX	A serial number restoration was performed on this item. Based upon the Collaborative Testing Services paperwork, the expected serial number configuration is six characters. The serial number was fully restored and appeared to be 6C1KF5.
HLQJD2	Items: Description/Visual Examination Item 1: A piece of cold rolled 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: 6 C 1 K F 5 was restored on Item 1. [Firearm and Toolmark Examiner.]
HM4K79	Report: The serial number is milled off. The serial number (6C1KF5) was restored by acid etching. Sanding, polishing, Modified Fry's and Nitric Acid 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.
HU3FH9	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. Serial number "6C1KF5" restored using chemical etching process. Scribed with case number "22-5250D" by examiner.

## TABLE 2

WebCode	Conclusions
HXL6Q6	TYPE OF EXAMINATION REQUESTED: Serial Number Restoration. RESULTS OF EXAMINATION: Serial Number Restoration Results: Examination and magnetic processing of the Item 1 steel bar restored the original obliterated serial number which was determined to be '6C1KF5'. Other Results: The Item 1-1 aluminum bar standard was not processed. Methodology: The following methodologies were used in the examination of this case: Visual Examination, Physical Examination, Microscopic Examination, Physical Processing, Magnetic Processing. DISPOSITION OF EVIDENCE: The evidence will be retained for pick-up unless otherwise authorized.
HZ42YB	A Full Restoration was determined to be: 6C1KF5.
HZA4VA	A serial number restoration was attempted using chemical etching techniques on Item 1. The characters were observed as 6C1KF5.
HZQR7U	Examination of the submitted cold rolled steel bar stock found the manufacturer's serial number to have been obliterated. The obliterated, original serial number was restored to read "6C1KF5".
J4N7DY	TWO DEVELOPMENT METHODS ARE USED: ELECTROMAGNETIC: The characters were not well observed and one of them could not be determined. The development was slow (greater than 30 minutes). CHEMICAL: With this method it was very fast (less than 5 minutes) and the contours of the characters were observed very well.
JD9266	The piece of steel was examined and determined to have a serial number which had been obliterated by grinding. Using standard chemical restoration techniques, the serial number was restored and determined to be 6C1KF5.
JEN4CD	Item 1 was physically and microscopically examined. The serial number area of Item 1 was prepared and chemically processed. As a result of these actions, the serial number was restored to read 6C1KF5.
JJYCF4	Item 1 was found to exhibit an area of obliteration. As a result of polishing, magnetic particle inspection, and using chemical etchants the following serial number was revealed: 6C1KF5.
JKVP6G	The 'Magnetic Particle Restoration' process was applied to Item 1 resulting in the visualisation of the alpha numeric characters without quotes '6 C 1 K F 5'. A 'Chemical Etching Restoration' process was applied to Item 1 resulting in the visualisation of the alpha numeric characters without quotes '6 C 1 K F 5'.
JNEMT8	The Exhibit 1 obliterated serial number, located on the front side of the bar stock, was visually and microscopically examined. The obliterated serial number was magnetically and chemically processed and restored to read: "6C1KF5".
K2CL8B	Item #1-1 was submitted with a defaced serial number. Magnetic restoration and chemical etching techniques were used to restore the serial number. The serial number was restored and found to be: 6C1KF5.
K2DPBL	Results of Examinations: The examination and processing of the obliterated serial number on the Item 1 bar stock was restored to read "6C1KF5".
K7BYRF	The obliterated serial number on the steel bar stock in Item #1 was partially restored and found to be 6 C 1 K * 5. The character represented by an * is either an E or an F.
KAABPZ	The serial number on item 1 was restored to 6C1KF5.
KBZAQW	An obliterated area was observed on Item 1. Standard chemical restoration techniques were used on the obliterated area. The following characters were revealed: 6C1KF5 Multiple factors could have had an effect on the interpretation of the restored characters.
KPLCG4	The serial number on the submitted cold rolled steel block, Item 1, was fully restored to read 6C1KF5.
KW2TWC	I visually inspected Item 1 and found no readily visible alpha or numeric characters. Attempts to restore the serial number were made by acid etching resulting in the serial number being restored to read "6C1KF5".

TABLE 2

WebCode	Conclusions
KW4R2Y	Examination of Item 1 revealed an obliterated area. Standard restoration techniques applied to Item 1 revealed the following characters: "6C1KF5". Multiple factors could have had an effect on the interpretation of the restored characters.
L37NFC	The serial number of Item 1 was restored using mechanical polishing, Magnetic Particle Inspection (MPI) and chemical etching techniques and was found to be: 6C1KF5.
L9QXE9	The serial number was restored using electrochemical etching and was found to be "6C1KF5".
LAMWLZ	1. Examination of Exhibit 1 revealed one (1) ferromagnetic piece of metal bar with an obliterated area measuring 65.85mm in length, 25.50mm in width, and 6.35mm thick. a). Standard restoration techniques were performed and the following characters were observed on the obliterated area of Exhibit 1: 6 C 1 K F 5. All Measurements are approximate.
LCQAA9	In my opinion the restored serial number was 6C1KF5 but i would also consider GC1RF5, although this is less likely in my opinion.
LMLF47	On examination, I found no number on the cold rolled steel bar stock. However, I observed the surface of cold rolled steel bar stock was filed. After electrochemical treatment, the obliterated serial number was restored and read as "6C1KF5".
LMQTV A	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" and "Wazau". By this process the number/letter combination "6C1KF5" could be made visible.
LTG378	[No Conclusions Reported.]
LVQH QD	The serial number was erased. I was able to restore the serial number. It read 6C1KF5.
LZ3X9W	Standard laboratory procedures for restoring serial numbers stamped on metal have been employed on the center of this steel bar stock. The serial number was determined to be "6C1KF5".
M2AR79	Serial number restoration revealed the number 6 C 1 K F 5.
M3FR98	Lab Item #1 (~steel bar stock with suspected obliterated serial number) was examined on 02/22/2022 and found to contain an area of obliteration with overlapping circular signatures with an area of parallel linear grinding marks. Serial number restoration commenced and was completed on 02/22/2022. Serial number restoration on Item #1 (~steel bar stock) was successfully recovered as: 6C1KF5.
M7LKG8	The serial number on the item 1 metal bar was fully restored to be 6C1KF5. The item STANDARD was only used for reference purposes.
MAHYQV	Attempts were made to recover the obliterated serial number on the piece of "cold rolled steel bar stock" (Item 1) utilizing physical and chemical analysis of the serialized metallic surface area. The restored serial number was determined to be 6C1KF5.
MC7DE6	Using standard laboratory techniques, the Item 1 obliterated serial number was restored and was determined to be: 6C1KF5.
MDFF6A	The serial restoration was ceased at 6:05 minutes. The full serial number was restored to read 6C1KF5.
MDLZ4U	The serial number on the bar stock section was restored to read 6C1KF5 using chemical etching techniques.
MHGREC	The serial number on the bar stock of Item 1 was determined to be "6C1KF5".
MRZZKX	1). The obliterated area on the Exhibit 1 metal block was processed using magnetic particle reagent. The following characters were observed: 6 C 1 K F 5.
MTX2VX	The serial number of the steel bar, described in the item 1, was restored and correspond to: 6C1KF5.
MUMEA8	Examinations showed the serial number of Item 1 to be obliterated. The serial number was restored using mechanical polishing and chemical etching techniques and was found to be: 6C1KF5.

TABLE 2

WebCode	Conclusions
MZAY4U	The serial number of the piece metal identified item 1 is 6C1KF5.
MZYVWX	The obliterated serial number on the metal bar, item 1, was restored to 6C1KF5.
N4L7Y8	The alphanumeric sequence of the analyzed piece of metal was erased by wear and by means of chemical restoration it was possible to obtain a sequence consistent with the comparative material provided.
N4REB2	Serial number restoration techniques were applied to item 1A. The serial number was determined to be 6C1KF5.
N4VBT6	Using standard laboratory techniques, the Item 1 serial number was restored to read: "6C1KF5."
N7AKMG	The original alphanumeric characters were detected as 6C1KF5.
N7ETZB	The following evidence was received, analyzed on the below listed date and marked for identification as follows: Item 1: One (1) piece of cold rolled steel bar stock with suspected obliterated serial number, marked Q1. The analysis of the above evidence was initiated on March 2, 2022. The steel bar stock was visually examined. Using polishing, magnetic and chemical etching methods, the serial number was restored to read: 6C1KF5.
NFGDXW	The development process was carried out in the area where it was altered and it was possible to restoration the alphanumeric sequence corresponding to 6C1KF5.
NFKV69	Restoration of the obliterated area on Item 1 metal bar stock revealed the following number: 6 C 1 K F/E 5.
NFY9K6	THE ERASED NUMBER CONSISTED OF 6 CHARACTERS, ALL OF WHICH I WAS ABLE TO RESTORE. THE OBLITERATED SERIAL NUMBER ON THE PIECE OF METAL WAS RESTORED TO READ 6C1KF5.
NM6VHZ	The serial number on the piece of metal (Exhibit 01) was mechanically and chemically treated and restored to read 6C1KF5. The piece of metal (Exhibit 02) was documented and photographed; however, no further analysis was performed.
NPPFA3	The serial number is milled off. The serial number (6C1KF5) 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: This item will be held in the Firearm Section's Evidence Room.
NU6TBP	Item 1 was treated with physical and chemical restoration techniques to reveal the obliterated characters. The complete original obliteration is "6 C 1 K F 5".
P2XHBQ	[No Conclusions Reported.]
P6KWYZ	As a result of an attempted obliterated number restoration the following characters were observed: 6C1KF5.
PDP4EZ	This report refers to exhibits by Lab Number. The following results only apply to the items tested. The Exhibit 1.1 obliterated number, located on the left side of the metal piece, was visually examined, magnetically, and chemically processed. The number was restored and determined to be "6C1KF5". The Exhibit 1.2 "Aluminum Standard" was not examined. These conclusions conform with the relevant Department of Justice policy on Uniform Language for Testimony and Reports available at <a href="http://www.justice.gov">www.justice.gov</a> .
PGUZFB	Examination of Item 1 revealed the presence of a defaced area. Item 1 was physically, chemically, and magnetically processed. The serial number was restored as: 6C1KF5



TABLE 2

WebCode	Conclusions
PLNRB7	The follow items were received in a sealed small yellow envelope box, labelled in part, "Sample Pack: SNR1". Each item was placed inside a sealed yellow envelope: (a) A piece of stainless steel bar (item labelled in part, "Item 1"). (b) A piece of aluminium bar (item labelled in part, "Aluminium Standard") I made an examination of these exhibits with the following results: The piece of stainless steel bar measured approximately 67 x 25mm in size and approximately 6mm in thickness. An obliterated section of one of the large surfaces was located, which measured approximately 25 x 25mm in size. Obvious toolmarks were present in this area, which were consistent with having been caused by a milling machine (or similar type device), given the even thickness of the damage. The obliterated area was smoothed off using a moderate grinding wheel and a combination of both coarse and fine emery paper, in order to remove the toolmarks present. The area was then polished with a buffer machine to a high mirror gloss, prior to the application of mild Nitric Acid and Fry's Reagent. During this application, the following serial number was restored and found to be: 6 C 1 K F 5.
PX3Q3U	The obliterated serial number on the piece of bar stock (Item 1) was magnetically processed and chemically restored to read "6C1KF5".
PXE3LD	[No Conclusions Reported.]
PXJAY8	The serial number on Item 1 was restored to read 6C1KF5 using chemical etching techniques.
Q4J2W4	Examination of Item 1 revealed the obliterated serial numbers on the center of the cold rolled steel bar stock. This area was polished, cleaned and chemically processed and the serial number was fully restored to consist of six alphanumeric characters appeared to be 6C1KF5. Based on the above findings, in my professional opinion, the original serial number on Item 1 was 6C1KF5.
QEKE4V	The serial number of item 1 was restored to 6C1KF5.
QLGCLR	The restoration procedure was applied to the steel bar and the alphanumeric sequence 6C1KF5 was obtained.
QMV7FR	Mechanical and chemical processing was applied and the following characters were developed: 6 C 1 K F 5.
QRTMU7	I conducted an examination of a piece of cold rolled steel. I observed that a section of the steel bar was ground. The ground metal surface was subjected to a serial number restoration technique and a full recovery of previously welded serial number 6C1KF5 was obtained.
QT2ETU	After applying the restore process, the reveal sequence 6C1KF5 will be obtained.
QTHLWQ	The serial number on the steel bar stock Item 1 was restored to read 6 C 1 K F 5 using chemical etching techniques.
RD93YY	One (1) ferrous bar (1" x 2 5/8") with a 1"x1" section removed containing an obliterated serial number. Chemical restoration techniques resulted in a full recovery of "6C1KF5".
RNMC44	Serial number restoration revealed the number 6 C 1 K F 5.
RR62JU	The serial number of piece of cold rolled steel bar stock, described in Item 1, was restored and correspond to: 6C1KF5.
RRK68R	Examination of Item 1 revealed an obliterated area on the steel bar stock. Standard chemical restoration techniques revealed the following character: "6C1KF5". Multiple factors could have had an effect on the interpretation of the restored characters.
RVQXER	The obliterated serial number on the Item 1 piece of metal was restored to read 6C1KF5.
RYHCT2	A request has been made to determine if the obliterated serial number or marking on the item submitted can be recovered. The serial marking of the steel bar stock, SNR1, has been removed from one flat side. After application of the electromagnetic and the chemical process, I determined the serial number of the steel bar stock, item SNR1, as 6C1KF5.
RZJ38W	The serial number on the metal plate (Exhibit 01) was mechanically and chemically treated and restored to read 6C1KF5.

TABLE 2

WebCode	Conclusions
T4CJXV	We succeed to restore partially the number. We just got an uncertainty with the fourth digit "B" or "H". So it's 6G1BF5 or 6G1HF5.
T72PZK	Serial Number Restoration Analysis: Methodology: Physical (Visual Examination), Microscopy (Comparison Microscope), Magnetic Particle Inspection, Chemical (Reagent Etching). Serial number restoration procedures revealed the serial number on Item 1A, the bar stock, to be: 6C1KF5.
T7XZZT	1). Examination of Exhibit 1 revealed one piece of ferromagnetic steel bar stock measuring 66.94 mm long, 25.35mm wide, and 6.30mm thick. a). There is an obliterated area in the approximate center of the steel bar stock. b). The following characters were observed on the obliterated area of the Exhibit 1 steel bar stock: 6 C 1 K F B. c). All measurements are approximates. TECHNICAL NOTES: Serial number restoration is dependent upon multiple factors to include the original stamping/engraving method, material type, obliteration method, and depth of material removed. The reported characters convey only the appearance of characters or partial characters that the examiner observed after the application of standard serial number restoration techniques. These characters are not considered absolute to the exclusion of other possible characters with similar shape or form.
T7ZXL6	Defaced bar stock (item #1) was magnetically, physically and chemically processed. Its serial number was restored to read 6C1KF5.
T97DY3	Serial number restoration revealed the number 6C1KF5.
TA4NU7	Examination and chemical processing of [Laboratory] Item 001 restored the original obliterated serial number which was determined to be 6C1KF5.
TD2AH3	The restored serial number on the bar stock marked "Item 1" was found to have six characters "6C1KF5".
TV3CY8	Attempts to physically and chemically restore the obliterated serial number of Laboratory Item 1 were successful. The restored serial number is 6C1KF5.
TW9AD2	Examinations showed the serial number of Item 1 to be obliterated. The serial number of Item 1 was restored using magnetic particle restoration and chemical etching techniques and was found to be 6C1KF5.
TY3NV8	Attempts to physically and chemically restore the obliterated serial number on the piece of steel bar stock, Laboratory Item 1, were successful. The restored serial number is 6C1KF5.
U3X7GH	The serial number on Item 1 was restored to read 6C1KF5 using chemical etching techniques.
U8VY63	Serial number restoration revealed the number 6 C 1 K F 5.
U9ZQQN	For the evidence received and identified internally in the Ballistics Unit as 2022-0722, it can be seen that alteration was present in the area where the impression was found, which itself could be recovered through the restoration process. After applying the procedure, the sequence revealed was 6C1KF5. It should be noted that the features revealed by this process are not permanently recovered and wear persists on the surface.
UA2JT3	Serial number restoration revealed the number 6 C 1 K F 5.
UARTD4	Item SNR1 was a steel bar with an obliterated serial number. The obliterated serial number appeared to have been ground off. Using a combination of polishing techniques, magnetic particle inspection (MPI) and chemical etching, the serial number on Item SNR1 was restored to 6 C 1 K F 5.
UAV767	The serial number was restored to read 6C1KF5 using chemical etching techniques.
UAVFQB	Results of Examinations: The examination and processing of the obliterated serial number on the Item 1 bar stock was restored to read "6C1KF5".
UBAXV2	Steel bar (1) was physically and chemically processed. Its serial number was restored to read: 6C1KF5.

TABLE 2

WebCode	Conclusions
UGCCQW	Date Worked: 03/07/2022. The serial number is milled off. The serial number (6C1KF5) was restored by acid etching. Polishing and the Modified 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. This item will be stored in the Firearm Section's Evidence Room.
UM6WY2	The serial number was fully restored to read 6C1KF5.
UULVNQ	Visual examination and chemical treatment of the serial number area on the bar stock, Item 1A, reveal the following number: 6C1KF5. Item 1B was inspected to verify and document contents. No analysis was performed on the item listed.
UWVCN6	Examination and processing of the metal bar, item 1, restored the original, obliterated serial number that was determined to be "6C1KF5".
V83WBV	The hypothesis that the serial number is 6 C 1 K F 5 is very strongly supported.
V8LJ8R	"6C1KF5" restored by chemical etching.
V92B93	Metal was attempted with non-destructive magnetic restoration method, followed by a chemical etching process. The serial number was identified as being 6C1KF5.
VE6GJY	The obliterated serial number on Item 1 was restored and found to consist of six alphanumeric characters, as follows; 6-C-1-K-F-5.
VEK4AM	Standard laboratory procedures for restoring serial numbers stamped in metal have been employed on the denoted region of this metal bar. The serial number was determined to be "6C1K5".
VEPX2L	Examination of Submission 001 bar found the serial number was obliterated. Submission 001 bar, was photographed before polishing the obliterated surface with a Dremel tool. Magnetic processing and chemical etchants were applied to the polished surface in order to restore the serial number. The serial number was restored to read 6C1KF5.
VGC7XN	The cold rolled steel bar presented alteration in one area, the restoration process was applied in this area and the serie 6C1KFS was restored. The restored characteristics through this process are not permanently recovered and alteration persists in the cold rolled steel bar.
VGDYWV	The serial number was successfully recovered and is 6C1KF5.
VR8FGQ	The piece of cold rolled steel bar stock identified E1-22-0716 ("Item 1"), has a obliterated number, it was possible to recover it by the sequence: "6C1KF5". The recovered features are not permanent. (*)
VR9A43	See additional comments (Question 5).
W9EW64	Serial number restoration was performed on item 1.1. The serial number 6C1KF5 was restored.
WFU83H	Item 1 was physically and chemically processed in an attempt to determine the serial number. The serial number was fully recovered as 6C1KF5.
WHHERL	Examination of Item 1 revealed an obliterated area on the front side left of center. Standard chemical restoration techniques revealed the following characters: "6C1K?5". The ? appears to be an F; however, the possibility of the character being an E could not be ruled out. Multiple factors could have had an effect on the interpretation of the restored characters.
WKLNN4	The obliterated number on Item 01 was polished and chemically restored to reveal the serial number 6C1KF5.
WKQJDN	The serial number on the submitted CTS 22-5250 (Item 1) was recovered to 6C1KF5.
WPHYUG	Visual examination and chemical treatment of the serial number area on the metal plate, Item 1A, reveal the following number: 6C1KF5. Item 1B was inspected to verify and document contents. No analysis was performed on the item listed.
WT4D9X	the obliterated area of the piece of cold rolled steel bar was polish. The area was then treated with Fry's chemical reagent. The serial number was revealed to be 6C1KF5.

TABLE 2

WebCode	Conclusions
X2T6AW	The possible serial number is 6C1KF5.
X343PY	Attempts to restore the obliterated serial number of Item 1 were successful. The restored serial number is 6C1KF5.
X9THGR	Serial number restoration techniques were applied to Item 1A (metal bar). The serial number was determined to be 6C1KF5.
XANTYT	The Exhibit 1 obliterated serial number near the middle of the bar stock was visually and microscopically examined. The obliterated serial number was magnetically and chemically processed, and restored to read "6C1KF5".
XCWDZU	Item 2-1-1 (CTS Item 1) was determined to be a piece of bar stock with an obliterated area. The obliterated area was examined. Using standard serial number restoration chemical techniques, the obliterated serial number on item 2-1-1 was restored to read: 6C1KF5.
XG8W9F	Visual examination and chemical treatment of the serial number area on the barstock, Item 1A, reveal the following number: 6C1KF5. Item 1B was inspected to verify and document contents. No analysis was performed on the item listed.
XGND2N	1). Examination of Exhibit 1 revealed it to be a ferromagnetic steel bar displaying an area of obliteration. Serial number restoration was performed and the following characters were observed: 6 C 1 K F 5.
XJBRPX	Examination of Item 1 revealed a possible obliterated serial number. Using standard laboratory physical and chemical restoration techniques, the obliterated serial number on Item 1 was restored to read: 6 C 1 K F 5.
XUQDMK	For the received piece of metal identified internally in the Ballistics Unit as E1-22-0735: His serial number (revealed) is 6C1KF5. 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 (*).
XV7BJQ	The serial number on the metal plate (Exhibit 01) was mechanically and chemically treated and restored to read 6C1KF5. The stamped metal plate (Exhibit 02) was documented and photographed; however, no further analysis was performed.
XX7C7L	Examination of Item 1 revealed an obliterated area. Standard chemical restoration techniques were applied to Item 1 and revealed the following characters: "6C1KF5". Multiple factors could have had an effect on the interpretation of the restored characters.
XY4UJ4	Examination and chemical processing of the obliterated serial number on item 1 was restored and determined to be "6C1KF5".
XZFN2P	ONE (1) BLOCK OF FERROUS METAL MEASURING APPROXIMATELY 2 3/4" LONG, 1" WIDE, 1/4" THICK & MILLED 1"X1" DOWN THE CENTER. SERIAL NUMBER "6C1KF5" RESTORED USING MAGNETIC PARTICLE INSPECTION (MPI).
XZYGR2	Through a combination of mechanical polishing, magnetic particle inspection, and chemical etching, the obliterated serial number was restored to read 6C1KF5.
Y28C7H	Item 1 was a steel bar stock with an area of obliteration on one side centrally. The method of obliteration appeared to be polishing/abrasion. As received, there were no recognizable characters under visual microscopic examination. The obliterated area on Item 1 was polished with both a Dremel tool and sandpaper and then chemical etchants were applied. A partial serial number of **1??? was restored. Furthermore, the first asterisk was a B, 8, or 6 and the second asterisk was a C or 0. Photographs documenting the progress of the restoration were taken.
Y2MXCD	Serial Number Restoration Analysis: Methodology: Physical (Visual Examination), Microscopy (Stereo/Comparison Microscope), Chemical (Reagent Etching), MPI (Magnetic Particle Inspection). Serial number restoration procedures revealed the serial number on Item 1, the piece of stainless steel bar stock, to be: 6 C 1 K F 5.

TABLE 2

WebCode	Conclusions
Y8URNH	A serial number restoration was attempted on the bar stock using chemical etching techniques. The characters were observed as 6 C 1 K F 5.
YA2KPN	The 1.1 Metal Bar was examined and serial number restoration processes were performed. The characters 6C1KF5 were restored on the 1.1 Metal Bar. This should be considered the complete serial number.
YERN9Y	Bar stock (Item #1) was physically/chemically/magnetically processed. Its serial number was restored to read: 6C1KF5.
YLUQDZ	The obliterated area on the piece of cold rolled bar stock in item 1 was chemically etched and the serial number was determined to be 6C1KF5.
YMNRLP	The Item #1 defaced metal plate was physically and chemically processed. Its serial number was restored to read: 6C1KF5.
YV6TYZ	The evidence in item 1 was analyzed by physical and microscopic examination. The obliterated area on the piece of cold rolled steel bar stock in item 1 was chemically etched and the serial number was determined to be 6C1KF5.
YVGUGT	EVIDENCE: Exhibit #: Description: 1A). Steel bar stock with suspected obliterated serial number. 1B). Aluminum Standard. RESULTS: Item 1A: A serial number restoration was attempted using magnetic particle inspection and chemical etching techniques on the steel bar stock. The characters were observed as 6C1KF5. Item 1B: The Aluminum Standard was not examined.
YVXX38	The serial number was obliterated as received. The serial number on Item 1 was recovered and found to be: 6C1KF5.
YZRR3U	The Item #1 obliterated serial number was recovered using a chemical etching technique. The recovered serial number is 6C1KF5.
Z2HC76	The recover numbers was: 6C1KF5.
Z3DGUQ	The piece of cold rolled steel bar stock was processed with Magnaflux and acid etching chemicals to restore the obliterated serial number. The serial number was restored as 6C1KF5.
Z8NCWF	Positive. A partial serial number was recovered. 6 (C or 0) 1K (F or E) 5.
Z96GJL	The serial number of piece of cold rolled steel bar stock, described in item 1, was restored a correspond to: 6C1KF5.
ZAUUXW	Examination of the bar stock in Item 1 revealed that the serial number had been obliterated. Using standard laboratory physical and chemical restoration techniques, the obliterated serial number on Item 1 was restored to read: 6 C 1 K F 5.
ZC6RFL	Through the examination (chemical and microscopic restoration process), carried out, the determination was: 1. The serial number on the cold rolled steel bar stock, described in Item 1, was restored and corresponds to 6C1KF5.
ZDU7TW	Using standard laboratory physical and chemical restoration techniques, the obliterated serial number on Item 1 was restored to read: 6 C 1 K F 5.
ZGX9UE	The original number was grinded and have been restored, read as 6C1KF5.
ZTFRH	A serial number restoration was attempted using chemical etching techniques on Item 1. The characters were observed as 6 C 1 K F 5.
ZWTQNH	A serial number restoration was attempted using chemical etching techniques on Item 1. The characters were observed as 6C1KF5.
ZYF6CT	A serial number restoration was attempted on the flat metal bar using a combination of Chemical Etching techniques and Magnetic Particle Inspection method. The serial number was restored and observed to read 6C1KF5.

# Sample Preparation

(listed in order of use)

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
23CFJC	Cleaning	Acetone	
29X2FH	Polishing	Dremel	
2FGZAW	Visual		
	Sanding	Emery paper	P240
	Polishing	Rotary Tool	Rubber wheel
	Cleaning	Ethanol	
2L3R7C	None		
2MGZB7	Polishing	Dremel	
2QGC87	Sanding	Sand paper	180 and 220
2RT2HV	Visual	Stereoscope	
	Sanding	Sand paper	150
2T3E9Q	Polishing	Dremel	
2YC8DG	Sanding	Sand paper	80, 220, 360
2YVXHV	Sanding	Sand paper	220, 400, 600.
2Z7WC	Visual	Acetone	
39BDNU	Sanding	Emery paper	150
	Sanding	Sand paper	1500
	Polishing	Dremel	
3AP8JG	Sanding	Sand paper	320
3H374T	Polishing	Dremel	
3JTYTP	Sanding	Sand paper	Fine grit
	Polishing	Dremel	
3QC3ZR	None		

TABLE 3

<b>Sample Preparation</b>				
<b>WebCode</b>	<b>Method</b>	<b>Tool Used</b>	<b>Grit Size</b>	
3VBGNG	Polishing	Sand paper	150 grit	
3VRZQL	Sanding	Sand paper	P150	
	Polishing	Dremel		
3Z2QXE	Visual	Stereoscope		
	Visual	MAGNETIC YOKE		
	Polishing	Dremel	120	
499UHJ	Sanding	Sand paper	220	
	Polishing	Sand paper	360	
4BYLH9	Polishing	Dremel		
	Sanding	Dremel	fine sanding wheel	
4EY9ZX	Visual	Microscope		
	Sanding	Dremel	80 to fine	
	Polishing	Dremel	wax	
4GN28F	None	Stereoscope		
4JC32P	Visual			
	Visual	Stereoscope		
	Polishing	Dremel		
4PCLYE	Sanding	Sand paper	360	
	Cleaning	Acetone		
4VLDFJ	Polishing	Dremel		
624ZPF	Cleaning	Acetone		
	Sanding	Sand paper	1000	
66MXFQ	Sanding	Sand paper	220 with oil, 400 with oil, 600 with oil	
68CWMG	Visual	Stereoscope		
	Sanding	Sand paper	120; 220; 800; 1500; 2000; 2500	

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
6AXBXP	None	Sand paper	220 and finer
6BBB8L	Polishing	Rotary Tool	
6FMNYD	Cleaning	acetone	
	Polishing	Steel wool	
6GGYPU	Polishing	Dremel	Extra Fine
6HB3MM	Grinding	Grinding wheel	
	Polishing	Buffing wheel	
6LDX9C	Polishing	Dremel	
6NLHBD	Polishing	Dremel	
6QLJW9	Polishing	Dremel	
6VXYFR	Polishing	Dremel	
6WCT88	Polishing	Dremel	N/A
72M9CP	Polishing	Dremel	
7637VR	Sanding		Fine
7AZPYC	Polishing	Dremel	
7BTLHE	Polishing	Sand paper	1000
7E7F2H	Visual	Stereoscope	
	Polishing	Dremel	
7ELP6Q	None		
7ERWHK	Sanding	Sand paper	120
7GEB7U	Visual	Stereoscope	
	Sanding	Sand paper	P320
	Polishing	Dremel	
7JLU7B	Polishing	Rotary Tool	N/A



TABLE 3

<b>WebCode</b>	<b>Method</b>	<b>Sample Preparation</b>	
		<b>Tool Used</b>	<b>Grit Size</b>
7KH63E	None		
7NCBBP	Cleaning	Acetone	
7NGHMH	Polishing	Dremel	
7TAKRH	Polishing	Dremel	
842XZD	Sanding	Sand paper	220 and 400
	Cleaning	Acetone	
8LNBFQ	Polishing	Dremel	
8PPMKK	Polishing	Rotary Tool	
8RDQ8J	Polishing	Rotary Tool	
8UYDY7	Visual	Microscope	
8YC3GU	Polishing	Dremel	
99BBGC	None		
9HZWRG	Visual	Stereoscope	
	Cleaning	Acetone	
	Polishing	Dremel	
9JVPEM	Sanding	Sand paper	Sand paper 360 and 400
9PKPPE	Visual	Stereoscope	
	Sanding	Dremel	180 grit
9V8HW8	Sanding	Sand paper	320
	Visual	Microscope	
9XYC3P	Sanding	Sand paper	180 and 1200
9Z4R3M	Sanding	Sand paper	320
9ZZWTP	Cleaning	Acetone	

TABLE 3

<b>WebCode</b>	<b>Method</b>	<b>Sample Preparation</b>	
		<b>Tool Used</b>	<b>Grit Size</b>
A28V3N	Polishing	Dremel	
	Sanding	Sand paper	320 and 600 grit
AHG3D6	Visual	Stereoscope	
	Polishing	Dremel	
AKMXAA	Visual	Microscope	
ALXX6J	Cleaning	Acetone	
APHMVM	None		
APXGFB	Polishing	Dremel	
ATXRCB	Polishing	Sand paper	320
AV3HEJ	Sanding	Dremel	240
AZZ9WB	Visual	Stereoscope	
B2KMTK	Visual		
	Sanding	Sand paper	400
B33YM4	Sanding	Sand paper	100C
	Polishing	Dremel	
B7FGQL	Sanding	Sand paper	60, 280, 320, 600, 1500
B97ZR6	Polishing	Dremel	NA
BEW6BF	Polishing	Dremel	NA
BKXR93	Polishing	Dremel	
BLVGLQ	Visual	Stereoscope	
	Cleaning	Acetone	
BMPDUK	Visual	Stereoscope	120
BMPNYG	Polishing	Dremel	

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
BTE4PA	Visual	Stereoscope	
	Polishing	Dremel	
BVHQUK	Cleaning	Acetone	
BVWM9H	Visual	Stereoscope	
	Polishing	Dremel	
BWV3UB	Sanding	Sand paper	80, 220
C3X2TJ	Sanding	Sand paper	100 & 320
CCLTFC	Cleaning	Acetone	
CCZGG4	Polishing	Dremel	
CFMV7D	Cleaning	Steel wool	
CJ3Y6B	Polishing	Dremel	
CPQMFM	Sanding	Dremel	fine grit
	Polishing	Dremel	
D3T29A	Visual		
	Sanding		120 Grit
	Polishing	Rotary Tool	
D7RD4A	Sanding	Sand paper	Fine
	Polishing	Buffer wheel	
D92VEL	Polishing	Dremel	
D9XZGE	Polishing	Dremel	
DBQRUK	Visual	Stereoscope	
	Sanding		400, 800 and 1200
DFGLUL	Cleaning	Stereoscope	
DMGV77	Sanding	Sand paper	220, 400
	Polishing	Sand paper	1000

TABLE 3

Sample Preparation			
<u>WebCode</u>	<u>Method</u>	<u>Tool Used</u>	<u>Grit Size</u>
DPMDA9	Polishing	Emery paper	240
DQXHKB	Visual	Stereoscope	
DRBM22	Visual	Stereoscope	
	Polishing	Emery paper	
	Polishing	Sand paper	220
DREGX9	Polishing	Sand paper	400 and 1000
DTKWAL	Polishing	Dremel	
E2V9NB	Polishing	Steel wool	N/A
EBZTZY	Cleaning	Acetone	
EE6LAH	Polishing	Rotary Tool	
	Sanding	Sand paper	FL202P
	Polishing	Emery paper	P800
	Polishing	Emery paper	3M734
EEF8LJ	Cleaning	Acetone	
EEJKDM	Polishing	Dremel	
EG9CK7	Polishing	Dremel	
EJA2JL	Visual	Stereoscope	
	Polishing	Dremel	
EKK7VN	Polishing	Sand paper	400
ELLUKE	None		
EUE33K	None		
EWMM3Y	Polishing	Dremel	
F8JHPF	Polishing	Dremel	
FEVVBH	Polishing	Dremel	

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
FK7TD7	Visual	Stereoscope	
	Sanding	Sand paper	220, 320, 800, 1000, 1500, 2000
	Polishing	Sand paper	1500, 2000 w/ WD-40
G4T94Y	Polishing	Dremel	
GAWH4Y	None		
	Grinding	Dremel	
	Polishing	Dremel	
GB7Y8J	Visual		
	Polishing	Dremel	fine
GDZMQF	Cleaning	Acetone	
GREF9W	Cleaning	SKC-S Aerosol	
	Polishing	Dremel	
	Cleaning	Acetone	
GVHLVD	Grinding	Dremel	
	Polishing	Dremel	
HF39BC	Sanding	Sand paper	500
HHCQH3	Sanding	Sand paper	400 and 1500
HKF7HY	Visual	Stereoscope	
	Sanding	Sand paper	120
HKW3AX	Cleaning	Acetone	
	Polishing	Dremel	
HLQJD2	None		
HM4K79	Sanding	Sand paper	Fine
	Polishing	Buffer wheel	Fine
HU3FH9	Polishing	Dremel	

TABLE 3

Sample Preparation			
<u>WebCode</u>	<u>Method</u>	<u>Tool Used</u>	<u>Grit Size</u>
HXL6Q6	Cleaning	Kimwipe	
	Visual	Stereoscope	
	Polishing	Dremel	
	Visual	Stereoscope	
HZ42YB	Visual	Illuminated magnifier	
	Grinding	Rotary Tool	
	None	wire brush	
	Sanding	Sand paper	120 and 180
HZA4VA	Visual	Stereoscope	Superfine P400
	Sanding	Sand paper	
HZQR7U	Sanding	Dremel	400
J4N7DY	Polishing	Sand paper	220 y 600
JD9266	Sanding	Sand paper	150, 320, and 400
JEN4CD	Visual	Stereoscope	
	Visual	Microscope	
	Sanding	Sand paper	220, 320, 400, 600
	Cleaning	Isopropyl Alcohol	
JJYCF4	Visual	Stereoscope	
JKVP6G	Sanding	Emery paper	240, 400, 600 and 800
	Polishing	Emery paper	1200
	Cleaning	Acetone	
JNEMT8	Cleaning	Acetone	
K2CL8B	Visual		
	Cleaning	Acetone	
	Polishing	Dremel	
K2DPBL	None		

TABLE 3

<b>WebCode</b>	<b>Method</b>	<b>Sample Preparation Tool Used</b>	<b>Grit Size</b>
K7BYRF	None		
KAABPZ	Polishing	Dremel	
KBZAQW	Polishing	Dremel	fine
KPLCG4	Polishing	Dremel	
KW2TWC	None		
KW4R2Y	Polishing	Dremel	
L37NFC	Polishing	Dremel	N/A
L9QXE9	Sanding	Sand paper	320
LAMWLZ	Visual	Microscope	
	Sanding	Sand paper	400 grit
LCQAA9	Polishing	Sand paper	180 to 3000
LMLF47	Cleaning	Acetone	NA
LMQTVA	Visual	Stereoscope	
	Grinding	hand file	
	Polishing	Sand paper	400
	Cleaning	Acetone	
LTG378	Polishing	Sand paper	320
LVQHQD	Visual	Microscope	
	Polishing	Rubber wheel	
	Polishing	Emery paper	250, 800 & 1200
	Cleaning	Acetone	
LZ3X9W	Polishing	Dremel	
M2AR79	Sanding	Dremel	
M3FR98	Visual	Stereoscope	
	Polishing	Dremel	medium-fine disc

TABLE 3

Sample Preparation			
<u>WebCode</u>	<u>Method</u>	<u>Tool Used</u>	<u>Grit Size</u>
M7LKG8	Polishing	Rotary Tool	
MAHYQV	Polishing	Dremel	
MC7DE6	Visual	Stereoscope	
	Grinding	Grinding wheel	
	Polishing	Buffing wheel	
MDFF6A	Visual	Stereoscope	
	Polishing	Emery paper	P240
	Polishing	Rubber wheel	
	Polishing	Emery paper	P800
	Polishing	Rubber wheel	
MDLZ4U	Grinding	Dremel	
	Sanding	Dremel	unknown/miscellaneous sanding wheel
	Polishing	Dremel	
MHGREC	Cleaning	water	
MRZZKX	Polishing	Dremel	
MTX2VX	Visual	Microscope	N/A
	Polishing	Sand paper	200
MUMEA8	Polishing	Dremel	
MZAY4U	Sanding	Sand paper	1000, 220
MZYVWX	Polishing	Dremel	
N4L7Y8	None	Sand paper	180,360,400
N4REB2	Polishing	Dremel	
N4VBT6	Polishing	Dremel	
N7AKMG	Sanding	Sand paper	1000
N7ETZB	Polishing	Dremel	



TABLE 3

<b>Sample Preparation</b>			
<b>WebCode</b>	<b>Method</b>	<b>Tool Used</b>	<b>Grit Size</b>
NFGDXW	Sanding	Sand paper	220
NFKV69	Visual	Eyes	
	Sanding	Dremel	60
	Sanding	Sand paper	400
	Polishing	Steel wool	
	Polishing	Dremel	
NFY9K6	Sanding	Sand paper	240, 3000
	Cleaning	Acetone	
NM6VHZ	Polishing	Dremel	
NPPFA3	Polishing	Rotary Tool	
NU6TBP	Polishing	Dremel	fine
P2XHBQ	Polishing	Dremel	
P6KWYZ	Grinding	Dremel	
	Sanding	Sand paper	326C
PDP4EZ	Visual	Stereoscope	
	Polishing	Dremel	
PGUZFB	Polishing	Dremel	
PLNRB7	Grinding	Dremel	
	Sanding	Emery paper	Coarse to fine
	Polishing	Rotary Tool	
PX3Q3U	Visual		
PXE3LD	Polishing	Rotary Tool	P600

TABLE 3

Sample Preparation			
<u>WebCode</u>	<u>Method</u>	<u>Tool Used</u>	<u>Grit Size</u>
PXJAY8	Visual	Camera	
	Visual	Stereoscope	
	Sanding	Sand paper	150
	Visual	Camera	
Q4J2W4	Visual	Microscope	Not applicable
	Sanding	Sand paper	320
	Sanding	Sand paper	600
	Sanding	Sand paper	1200
	Cleaning	Acetone	Not applicable
	Visual	Microscope	Not applicable
QEKE4V	Polishing	Rotary Tool	red oxide
QLGCLR	Sanding	Sand paper	80, 220, 400 and 1000
QMV7FR	Visual	Stereoscope	
	Sanding	Sand paper	120, 180, 240
	Polishing	Dremel	
QRTMU7	Sanding	Sand paper	600 and 1200
QT2ETU	Polishing	Sand paper	1000, 360
QTHLWQ	Sanding	Sand paper	150
RD93YY	Polishing	Rotary Tool	
RNMC44	Polishing	Rotary Tool	
	Cleaning	Acetone	
RR62JU	Visual	Microscope and Magnifying glass	
	Cleaning	Acetone	N/A
	Polishing	Sand paper	Grit size 100, 200, 500
RRK68R	Polishing	Dremel	#500

TABLE 3

WebCode	Method	Sample Preparation	
		Tool Used	Grit Size
RVQXER	Polishing	Dremel	
RYHCT2	Visual	Microscope	
	Sanding	Sand paper	100
	Sanding	Sand paper	150
	Sanding	Emery paper	600
	Polishing	Rotary Tool	
RZJ38W	Polishing	Dremel	N/A
T4CJXV	Cleaning	Rotary Tool	
T72PZK	Visual	Microscope	
T7XZZT	Visual	Microscope	
	Sanding	Sand paper	400
T7ZXL6	Visual	Zeiss Discovery V20 Stereomicroscope	N/A
T97DY3	Grinding	Rotary Tool	
TA4NU7	Visual		
	Polishing	Dremel	
TD2AH3	Sanding	Sand paper	360, 600, 800, 1000
TV3CY8	Polishing	Dremel	
TW9AD2	Polishing	Dremel	3M wheel
TY3NV8	Polishing	Dremel	
U3X7GH	Visual		
	Visual		
U8VY63	Grinding	Bench Grinder	
U9ZQQN	Sanding	Sand paper	220, 1000

TABLE 3

Sample Preparation			
<u>WebCode</u>	<u>Method</u>	<u>Tool Used</u>	<u>Grit Size</u>
UA2JT3	Polishing	Acetone	
	Grinding	8" Bench Grinder	
	Polishing	Acetone	
UARTD4	Polishing	Dremel	
UAV767	Visual	Stereoscope	
	Polishing	Dremel	steel wool attachment
UAVFQB	None		
UBAXV2	Sanding	Sand paper	Fine
UGCCQW	Polishing	Sand paper	Fine
UM6WY2	None		
UULVNQ	Polishing	Sand paper	800
UVWCN6	Visual	Stereoscope	
	Polishing	Dremel	
V83WBV	Sanding	Sand paper	400
V8LJ8R	Polishing	Dremel	
V92B93	Visual	light source	
	Sanding	Sand paper	400,800 and 1200
	Polishing	Steel wool	
	Cleaning	Acetone	
VE6GJY	Sanding	Sand paper	600
VEK4AM	Visual		
	Visual	Stereoscope	
	Polishing	Dremel	
VEPX2L	Visual	Stereoscope	
	Polishing	Stereoscope	

TABLE 3

Sample Preparation			
<u>WebCode</u>	<u>Method</u>	<u>Tool Used</u>	<u>Grit Size</u>
VGC7XN	Sanding	Sand paper	#80, 220, 1000
VGDYWW	Sanding	Rotary Tool	
	Polishing	Sand paper	
VR8FGQ	Sanding	Sand paper	80 & 200
VR9A43	Sanding	Sand paper	Fine
W9EW64	Polishing	Dremel	
WFU83H	Polishing	Dremel	Ex-fine
WHHERL	Polishing	Dremel	
WKLNN4	Visual		
	Polishing	Dremel	
WKQJDN	Polishing	Dremel	NA
WPHYUG	Sanding	Sand paper	220
WT4D9X	Polishing	Rotary Tool	
X2T6AW	Polishing	Dremel	240
X343PY	Polishing	Dremel	
X9THGR	Visual	Stereoscope	
	Polishing	Dremel	
	Visual	Stereoscope	
XANTYT	None		
XCWDZU	Sanding	Sand paper	unknown
	Polishing	Dremel	
XG8W9F	Visual	Stereoscope	
	Sanding	Sand paper	220

TABLE 3

WebCode	Method	Sample Preparation	
		Tool Used	Grit Size
XGND2N	Polishing	Dremel	
	Visual	Stereoscope	
XJBRPX	Sanding	Sand paper	400P
XUQDMK	Sanding	Sand paper	220, 400 and 1000
	Cleaning	Acetone	
XV7BJQ	Polishing	Dremel	
XX7C7L	Polishing	Dremel	
XY4UJ4	Visual		
	Polishing	Dremel	
XZFN2P	Polishing	Stereoscope	
XZYGR2	Visual	Stereoscope	
	Sanding	Sand paper	220, 400, 600
	Polishing	Dremel	
Y28C7H	Visual	Stereoscope	
	Polishing	Dremel	
	Sanding	Sand paper	120 and 180 grit
Y2MXCD	Visual		
Y8URNH	Visual	Stereoscope	
	Visual	Microscope	
	Sanding	Sand paper	1200
YA2KPN	Polishing	Dremel	
YERN9Y	Visual	Zeiss Stereomicroscope	N/A
YLUQDZ	Visual	Stereoscope	
	Polishing	Dremel	425 wheel

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
YMNRLP	Sanding	Emery paper	180
	Polishing	Dremel	
YV6TYZ	Visual	Stereoscope	
	Polishing	Dremel	polishing wheel
YVGUGT	Visual	Stereoscope	
	Sanding	Sand paper	P400 Super Fine
YVXX38	Cleaning	Microscope	
YZRR3U	Polishing	flitz	
	Sanding	Rotary Tool	
Z2HC76	Cleaning	Sand paper	200-300-600-2000
Z3DGUQ	Polishing	Steel wool	
	Sanding	Sand paper	240 Grit
Z8NCWF	Visual	determined to be magnetic	
	Sanding	Dremel	
	Sanding	Sand paper	medium grit and 600 grit
Z96GJL	Polishing	Magnifying Glass and Microscope	100/200
ZAUUXW	Sanding	Sand paper	400
ZC6RFL	Visual	Stereoscope	
	Cleaning	Acetone	
	Polishing	Sand paper	500
	Cleaning	Acetone	
ZDU7TW	Visual	Stereoscope	
	Cleaning	Ethanol	
	Sanding	Sand paper	fine and coarse
ZGX9UE	Cleaning	Acetone	

TABLE 3

<b>Sample Preparation</b>			
<b>WebCode</b>	<b>Method</b>	<b>Tool Used</b>	<b>Grit Size</b>
ZTFRH	Visual	Stereoscope	
	Sanding	Sand paper	600, 320 grit
	Polishing	Sand paper	1200 grit
ZWTQNH	Visual	Eyes	
	Visual	Microscope	
	Visual	Camera/photos (to record as received condition)	
	Sanding	Sand paper	220 and 600 grit sizes used
ZYF6CT	Sanding	Sand paper	P400
	Polishing	Steel wool	
	Cleaning	Magnet and Electric Contour Probe	
	Visual		

<b>Response Summary</b>		<b>Participants: 281</b>
<b>Sample Preparation</b>		
<b>Visual Method:</b>	<b>79</b>	
<b>Sanding Method:</b>	<b>96</b>	
<b>Polishing Method:</b>	<b>166</b>	
<b>None:</b>	<b>20</b>	
<p>Note: Participants may use more than one sample preparation method therefore the total number of preparation methods used may not be equivalent to the total number of participants.</p>		



# Recovery Methods

(listed in order of use)

TABLE 4

Recovery Methods		
WebCode	Method	Time
23CFJC	Acid Etch Method	10-15 minutes
29X2FH	MagnaFlux	
	Davis' Reagent	5-10 seconds
	MagnaFlux	
	Davis' Reagent	5-10 seconds
	MagnaFlux	
	Turner's Reagent	5-10 seconds
	MagnaFlux	
	Davis' & Turner's Reagents	5-10 seconds
	MagnaFlux	
2FGZAW	Fry's Reagent	5min
	Fry's Reagent	15min
	Fry's Reagent	20min
2L3R7C	Acidic Ferric Chloride	1 minutes
2MGZB7	MagnaFlux	
	Turner's Reagent	Brushed with a swab in 30 sec increments for ~5 min total
	Acid Etch Method	Davis; brushed with a swab in 30 sec increments for ~5 min total
	Fry's Reagent	Brushed with a swab in 30 sec increments for ~8 min total
2QGC87	Davis Reagent	20 min
2RT2HV	Davis Reagent	less than 1 second (swiping motion)
	Turner's Reagent	less than 1 second (swiping motion)
	Fry's Reagent	less than 1 second (swiping motion)
2T3E9Q	Fry's Reagent	1 1/2 hours of intermittent use
2YC8DG	MagnaFlux	
2YVXHV	Acid Etch Method	HN03 30%, FRY, 15 minutes each one
2Z7WVC	Acidic Ferric Chloride	15 minute
39BDNU	Acid Etch Method	10 minutes
3AP8JG	Fry's Reagent	
3H374T	MagnaFlux	
	Davis Reagent (acid etch)	10-60 seconds (x5)

TABLE 4

Recovery Methods		
WebCode	Method	Time
3JTYTP	Fry's Reagent	5-15 secs before wiping away; process repeated over the course of several days
	25% Nitric Acid	5-15 secs before wiping away; process repeated over the course of several days
3QC3ZR	MagnaFlux	I used a cotton swab dipped in Fry's reagent and rubbed the area.
	Acid Etch Method	
3VBGNG	MagnaFlux	
	Davis's Reagent	1 minute
	Fry's Reagent	1 minute
	Davis's Reagent	1 minute
3VRZQL	MagnaFlux	N/A
3Z2QXE	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	
499UHH	MagnaFlux	
	Fry's Reagent	3 minutes
	Turner's Reagent	2 minute
4BYLH9	MagnaFlux	
	Turner's Reagent	~30 second increments
4EY9ZX	Acid Etch Method	30 min
4GN28F	Magnetic Particle Inspection (MPI)	
	Acid Etch Method	~30 seconds to 2 minutes
4JC32P	Turner's Reagent	1 sec - 30 secs before wiping off and reapplying
	Fry's Reagent	1 sec - 30 secs before wiping off and reapplying
	Ferric Chloride	1 sec - 30 secs before wiping off and reapplying
	Acidic Ferric Chloride	1 sec - 30 secs before wiping off and reapplying
	Nitric Acid (25%)	1 sec - 30 secs before wiping off and reapplying
	Sodium Hydroxide (10%)	1 sec - 30 secs before wiping off and reapplying
	MagnaFlux	
4PCLYE	MagnaFlux	
	MagnaFlux	2 min
	Acid Etch Method	HNO3 1MIN
	Fry's Reagent	2 min

TABLE 4

## Recovery Methods

<b>WebCode</b>	<b>Method</b>	<b>Time</b>
4VLDFJ	MagnaFlux	
	Fry's Reagent	Five minutes
	Turner's Reagent	10-15 seconds
624ZPF	Fry's Reagent	14 applications of approximately 20 seconds each.
66MXFQ	Magnetic Particle Inspection (MPI)	Black solution
	Fry's Reagent	aproximately 20 minutes
68CWVG	Acid Etch Method	1.5 hours
6AXBXP	Fry's Reagent	approximately 5-10 minutes over several application
	25% Nitric Acid	approximately 1-2 minutes
6BBB8L	Acidic Ferric Chloride	15-20 SECONDS
	Turner's Reagent	30-60 SECONDS
	DAVIS	30-60 SECONDS
	Fry's Reagent	30-60 SECONDS
6FMNYD	Fry's Reagent	30 seconds to 1 minute
6GGYPU	Restor-a-Gel	Two minutes at a time
6HB3MM	Fry's Reagent	minute or less then rinsed, repeated
6LDX9C	Fry's Reagent	SWIPES FOR A MINUTE +/-
	MagnaFlux	40 SECONDS
	Fry's Reagent	1 MINUTE
6NLHBD	Davis Reagent	<1 minute
	Turner's Reagent	<1 minute
	Fry's Reagent	<3 minutes
	Cupric Chloride Reagent	<1 minute
	Acidic Ferric Chloride	<2 minutes
6QLJW9	MagnaFlux	
6VXYFR	Magnetic Particle Inspection (MPI)	No change
	Fry's Reagent	less than 5 minutes
6WCT88	MagnaFlux	N/A
	Turner's Reagent	Application used over a span of a few hours
72M9CP	Ferric Chloride (non-acidic)	

TABLE 4

## Recovery Methods

WebCode	Method	Time
7637VR	Fry's Reagent	less than 30 sec
	Fry's Reagent	less than 30 sec
	Fry's Reagent	less than 30 sec
	Davis	less than 30 sec
	25% Nitric Acid	less than 30 sec
7AZPYC	Fry's Reagent	less than a minute
	MagnaFlux	3-4 minutes
	cupric chloride	less than a minute
7BTLHE	MagnaFlux	*****
	Fry's Reagent	20 minutes
7E7F2H	MagnaFlux	
	Fry's Reagent	1 1/2 minutes
	Turner's Reagent	1 minute
7ELP6Q	MagnaFlux	20 seconds
	Davis Reagent	
	Turner's Reagent	
	Fry's Reagent	
7ERWHK	Acid Etch Method	20 min.
7GEB7U	Davis Reagent	1 second between swipes of chemical
	Turner's Reagent	1 second between swipes of chemical
	Fry's Reagent	1 second between swipes of chemical
7JLU7B	MagnaFlux	
	Fry's Reagent	Intervals
7KH63E	Fry's Reagent	swabbed & pooled
	Grinder	
	Fry's Reagent	swabbed & pooled
7NCBBP	Acid Etch Method	10 MINUTES
	Fry's Reagent	5 MINUTES
	Acid Etch Method	12 MINUTES
7NGHMH	Modified Fry's Reagent, 20% Nitric Acid	Lightly added and removed with a swab over the course of 2 hours
7TAKRH	MagnaFlux	
	Ferric Chloride	5 Minutes
842XZD	MagnaFlux	
	Fry's Reagent	10 minutes

TABLE 4

Recovery Methods		
WebCode	Method	Time
8LNBFQ	Acid Etch Method	Davis Reagent, 1 min
	Turner's Reagent	2 min
	Fry's Reagent	1 min
	Acid Etch Method	Davis Reagent, 2 min
	Turner's Reagent	1 min
8PPMKK	Fry's Reagent	3 to 5 minutes
8RDQ8J	Fry's Reagent	30 seconds
	Turner's Reagent	30 seconds
	MagnaFlux	30 seconds
8UYDY7	JKMC004 - Examination and Restoration of Erased Identification Numbers/Markings.	8 minutes
8YC3GU	Davis Reagent	continued swipes for 5 minutes
	Turner's Reagent	continued swipes for 10 minutes
	Fry's Reagent	continued swipes for 3 minutes
	Turner's Reagent	continued swipes for 5 minutes
	Davis Reagent	continued swipes for 3 minutes
	Fry's Reagent	continued swipes for 3 minutes
	Turner's Reagent	continued swipes for 3 minutes
9HZWRG	Cupric Chloride	3 minutes
	Davis's Reagent	5 minutes
	Turner's Reagent	5 minutes
	Fry's Reagent	5 minutes
	Steel Alloy	5 minutes
	25% Nitric Acid	10 minutes
	Light Dremel stone polish	
	Magnetic Particle Inspection (MPI)	2 minutes
	Ferric Chloride & 25% Nitric Acid	5 minutes
	Magnetic Particle Inspection (MPI)	2 minutes
9JVPEM	MagnaFlux	
9PKPPE	Fry's Reagent	(Modified Fry's) 5 minutes
9V8HW8	MagnaFlux	
	Acid Etch Method	10
	Acidic Ferric Chloride	30
	Fry's Reagent	60
9XYC3P	Fry's Reagent	38 minutes
9Z4R3M	Acid Etch Method	5 times each for about 30 seconds

TABLE 4

Recovery Methods		
WebCode	Method	Time
9ZZWTP	NiS	20 min
	Fry's Reagent	10 min
	Nitric Acid	15 min
A28V3N	Magnetic Particle Inspection (MPI)	
	Davis	2 min
	Turner's Reagent	2 min
AHG3D6	Fry's Reagent	8 min
	MagnaFlux	
	10% Nitric Acid	40 min total
AKMXAA	Fry's Reagent	2 min
	Fry's Reagent	0,5h
ALXX6J	Fry's Reagent	10-15 minutes
APHMVM	Acid Etch Method	10 minutes
APXGFB	MagnaFlux	
ATXRCB	MagnaFlux	
	Davis Reagent	swabbed on several times, did not sit
	Turner's Reagent	swabbed on several times, did not sit
	Fry's Reagent	swabbed on several times, did not sit
AV3HEJ	Fry's Reagent	N/A
AZZ9WB	Turner's Reagent	One hour
B2KMTK	MagnaFlux	
	Acid Etch Method	1 min
	Fry's Reagent	1-2 min
B33YM4	MagnaFlux	
	Acidic Ferric Chloride	c. 5 minutes
B7FGQL	Fry's Reagent	1 or 2 minutes at a time.
B97ZR6	Fry's Reagent	1 hour
BEW6BF	Fry's Reagent	NA

TABLE 4

Recovery Methods		
WebCode	Method	Time
BKXR93	Acid Etch Method	Davis Reagent used for ~20 minutes with continuous movement of applicator (swabs)
	Turner's Reagent	~10 minutes with continuous movement of the applicator (swabs)
	Acid Etch Method	Davis Reagent used for ~20 minutes with continuous movement of applicator (swabs)
	Fry's Reagent	~45 minutes with continuous movement of the applicator (swabs)
	Acid Etch Method	H3PO4/HNO3 ~2 minutes at rest
	Fry's Reagent	~20 minutes with continuous movement of the applicator (swabs)
BLVGLQ	Acidic Ferric Chloride	5 minutes
BMPDUK	MagnaFlux	N/A
	Sanding	N/A
	Turner's Reagent	N/A
	Davis	N/A
	Fry's Reagent	N/A
BMPNYG	MagnaFlux	
BTE4PA	MagnaFlux	
	20% Nitric Acid	13 swabs passed over obliteration area
	Acidic Ferric Chloride	3 swabs passed over obliteration area
	Fry's Reagent water	15 swabs passed over obliteration area
BVHQUK	Fry's Reagent	About tirthy minutes
BVWM9H	Fry's Reagent	Applied and reapplied over 3.5 hrs
BWV3UB	MagnaFlux	
	Fry's Reagent	Five minutes
	Turner's Reagent	Five minutes
C3X2TJ	MagnaFlux	
CCLTFC	MagnaFlux	
	Acid Etch Method	Acidic Ferric Chloride ~10 min.
	Acid Etch Method	Phospheric / Nitric Acid. ~2 min.
CCZGG4	Acid Etch Method	3 minutes

TABLE 4

Recovery Methods		
WebCode	Method	Time
CFMV7D	Fry's Reagent	applied with cotton swab in a swiping motion 5-10 times
	Turner's Reagent	applied with cotton swab in a swiping motion 5-10 times
	Davis' Reagent	applied with cotton swab in a swiping motion 5-10 times
	25% Nitric Acid	applied with cotton swab in a swiping motion 5-10 times
CJ3Y6B	Turner's Reagent	approximately 1 - 3 minutes
	Fry's Reagent	approximately 3 to 5 minutes total (in intervals)
	Reagent E	approximately 1 minute (used as a highlighter)
CPQMFM	Fry's Reagent	6 minutes
	25% Nitric Acid	1 minute
D3T29A	MagnaFlux	
	Fry's Reagent	Fry's for about 10 min
	Nitric Acid	Nitric Acid for about 5 min
	Fry's Reagent	Fry's for about 5 min
D7RD4A	Fry's Reagent	12 minutes
	Nitric Acid	4 minutes
D92VEL	Acid Etch Method	Total time = ~ 6 minutes
	Fry's Reagent	multiple applications 3 mins
	Davis Reagent	multiple applications 3 mins
D9XZGE	Turner's Reagent	1 min
	Davis'/Fry's	1 min
	Davis'/Fry's	2 min
	Turner's Reagent	1 min
	Fry's Reagent	30 sec
	Fry's/Davis'	5 min
	Turner's/Davis'	5 min
DBQRUK	Fry's Reagent	4 mins
DFGLUL	MagnaFlux	
DMGV77	MagnaFlux	
	Fry's Reagent	15-30
DPMDA9	Fry's Reagent	a few seconds at a time
	Nitric Acid 25% solution	1 swip
DQXHKB	MagnaFlux	



TABLE 4

Recovery Methods		
WebCode	Method	Time
DRBM22	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	30 min
DREGX9	MagnaFlux	1 min
DTKWAL	MagnaFlux	
	Turner's Reagent	1 minute
	Fry's Reagent	2 minutes
	Nitric Acid	1 minute
E2V9NB	Fry's Reagent	3 minutes
	Turner's Reagent	~ 3 minutes
	Fry's Reagent	~ 5 minutes
	Fry's Reagent	~ 10 minutes
EBZTZY	Acid Etch Method	10 mins
EE6LAH	Fry's Reagent	2 minutes.
EEF8LJ	Wazau and Mipro acier	half an hour (30 min)
EEJKDM	MagnaFlux	3 min
	Davis	1 min
	Turner's Reagent	1 min
	Fry's Reagent	1 min
	25% Nitric Acid	1 min
EG9CK7	MagnaFlux	
	Fry's Reagent	30 seconds
	Fry's Reagent	30 seconds
	MagnaFlux	
	Fry's Reagent	30 seconds
EJA2JL	25% Nitric Acid	30 seconds
	Magnetic Particle Inspection (MPI)	
EKK7VN	Acid Etch Method	2-3 MINUTES EACH TIME
	Acid Etch Method	Many successives applications of 3-5 sec each
ELLUKE	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	~10 minutes

TABLE 4

Recovery Methods		
WebCode	Method	Time
EUE33K	Turner's Reagent	~1 min
	Acid Etch Method	Davis' ~2 min
	Acid Etch Method	Fort's ~30 sec
	Acid Etch Method	Davis' ~2 min
	Acid Etch Method	HCL ~ 30 sec
	Acid Etch Method	Aqua Regia ~ 2 min
	Acid Etch Method	Davis' ~2 min
	Turner's Reagent	~2 min
	Acid Etch Method	Aqua Regia ~ 1 min
EWMM3Y	MagnaFlux	
F8JHPF	Fry's Reagent	2-10 minutes
FEVWBH	Iron steel reagent	30 - 45 min.
	MagnaFlux	
FK7TD7	Acid Etch Method	approx. 13 minutes total
G4T94Y	Fry's Reagent	10 seconds per swab
GAWH4Y	MagnaFlux	
GB7Y8J	Fry's Reagent	5 minutes
	Fry's Reagent	5 minutes
	Fry's Reagent	7 minutes
	Fry's Reagent	6 minutes
	Fry's Reagent	7 minutes
	Fry's Reagent	4 minutes
GDZMQF	Nitric Acid	15 min
	Fry's Reagent	10 min
GREF9W	Magnetic Particle Inspection (MPI)	
GVHLVD	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.
HF39BC	MagnaFlux	
	Fry's Reagent	A couple minutes
HHCQH3	Fry's Reagent	3 applications - 2 minutes each
HKF7HY	Magnetic Particle Inspection (MPI)	Magnaflux
	Davis's Reagent	5 minutes
	Fry's Reagent	5 minutes
	25% Nitric Acid	2 minutes

TABLE 4

## Recovery Methods

<b>WebCode</b>	<b>Method</b>	<b>Time</b>
HKW3AX	MagnaFlux	
	Davis reagent	2 minutes
	Turner's Reagent	2 minutes
	Fry's Reagent	~ 3 minutes
HLQJD2	Fry's Reagent	less than 30 minutes
HM4K79	Fry's Reagent	5 minutes
	Nitric Acid	30 seconds to enhance photo
HU3FH9	Magnetic Particle Inspection (MPI)	NEGATIVE RESULTS
	Acid Etch Method	APROX 1 HR
HXL6Q6	Magnetic Particle Inspection (MPI)	
HZ42YB	Modified Fry's Reagent	Varying short intervals with monitoring
	Fry's Reagent	Over a nine hour period for completion
HZA4VA	MagnaFlux	
	Turner's Reagent	1 second
	Fry's Reagent	1 second
HZQR7U	MagnaFlux	N/A
J4N7DY	Fry's Reagent	2 minutos
	Acid Etch Method	2 minutos
JD9266	Fry's Reagent	just a few seconds
	25% Nitric Acid	just a few seconds
JEN4CD	Davis Reagent	3 minutes
	Turner's Reagent	3 minutes
	Fry's Reagent	30 minutes
	Fry's Reagent mixed with Turner's Reagent as highlighter	5 minutes
JJYCF4	Magnetic Particle Inspection (MPI)	
	Polished-Dremel	
	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	2 seconds
	Acidic Ferric Chloride	5 minutes
	Fry's Reagent	1 minute
	Magnetic Particle Inspection (MPI)	
Polish-fine sandpaper/MPI		
JKVP6G	Electro-magnetic	
	Griffin Reagent	

TABLE 4

Recovery Methods		
WebCode	Method	Time
JNEMT8	Magnetic Particle Inspection (MPI)	
	Davis' Reagent	1 hour
	Magnetic Particle Inspection (MPI)	
	Davis' Reagent	1 hour
	Turner's Reagent	1 hour
	Magnetic Particle Inspection (MPI)	
K2CL8B	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	30 seconds at a time, a few times
K7BYRF	25% Nitric acid and Fry's reagent	~30 min
KAABPZ	Fry's Reagent	Multiple applications of varying times
KBZAQW	MagnaFlux	
	alternating Fry's and 20% Nitric Acid	5 min
	alternating Acidic Ferric Chloride & 20% Nitric Acid	5 min
	Fry's Reagent	5 min
	alternating Fry's & Sodium Hydroxide	7 min
	Fry's Reagent	2 min
KPLCG4	Fry's Reagent	15 minutes
	MagnaFlux	1 minute
KW2TWC	Turner's Reagent	1 Minute
	Fry's Reagent	1 Minute
	25% nitric acid	1 Minute
	Acidic Ferric	1 Minute
	Nitric 25%	1 Minute
	Acidic Ferric	1 Minute
KW4R2Y	MagnaFlux	
	Acid Etch Method	applied acid by swabbing for approximately 30 mins
L37NFC	Magnetic Particle Inspection (MPI)	N/A
	Fry's Reagent	Approx. thirty to forty minutes.
L9QXE9	Electro-acid	
LAMWLZ	MagnaFlux	
	Davis' Reagent	5min
	Turner's Reagent	5min
	Fry's Reagent	30min
LCQAA9	Fry's Reagent	2 hours
	MagnaFlux	

TABLE 4

Recovery Methods		
WebCode	Method	Time
LMLF47	Acid Etch Method	15 minutes
LMQTVA	Oberhofer	10 min
	Wazau	10 min
	Oberhofer	20 min
	Wazau	5 min
	Oberhofer	5 min
LTG378	Acidic Ferric Chloride	5 minutes
LVQHGD	Fry's Reagent	7 minutes
LZ3X9W	Fry's Reagent	10 minutes
M2AR79	MagnaFlux	
	Fry's Reagent	1 min - constant rubbing
	Zinc Alloy Etching Solution - Solution 1	1 min - constant rubbing
M3FR98	MagnaFlux	
	Turner's Reagent	1 minute
	Fry's Reagent	1 minute
M7LKG8	MagnaFlux	
	Fry's Reagent	1 minute
MAHYQV	Fry's Reagent	
	Davis	
MC7DE6	Turner's Reagent	< 1 minute, rinsed, reapplied as necessary
	Fry's Reagent	< 1 minute, rinsed, reapplied as necessary
MDFF6A	Fry's Reagent	
MDLZ4U	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	around 10 minutes total

TABLE 4

Recovery Methods		
WebCode	Method	Time
MHGREC	Magnetic Particle Inspection (MPI)	repeated twice
	Davis	1 min
	Davis	1 min
	Davis	1 min
	Fry's Reagent	30 seconds
	Davis	1 min
	Fry's Reagent	30 seconds
	Davis	30 seconds
	Fry's Reagent	30 seconds
	Davis	1 minute
	Fry's Reagent	30 seconds
	Davis	1 min
Davis	1 min	
MRZZKX	MagnaFlux	
MTX2VX	Acid Etch Method	
	Davi's Reagent	15 Minutes
	Turner's Reagent	10 Minutes
	Fry's Reagent	10 Minutes
MUMEA8	Turner's Reagent	15 seconds
	Fry's Reagent	15 seconds
	Turner's Reagent	30 seconds
	Fry's Reagent	30 seconds
	Turner's Reagent	30 seconds
MZAY4U	MagnaFlux	
	Fry's Reagent	Five minutes
	Turner's Reagent	Five minutes
MZVWVX	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	Approx. 15 minutes total.
N4L7Y8	Electro-magnetic	
	Acid Etch Method	HNO <sub>3</sub> , 5 minutos
	Fry's Reagent	5 minutos
N4REB2	Fry's Reagent	several applications of 2-3 minutes each
	Turner's Reagent	followed Fry's - 20 seconds
N4VBT6	Davis Reagent	30 seconds
	Turner's Reagent	30 seconds
	Fry's Reagent	1-5 minutes (off and on)
	water	30 seconds

TABLE 4

## Recovery Methods

<b>WebCode</b>	<b>Method</b>	<b>Time</b>
N7AKMG	Fry's Reagent	about 30 minutes
N7ETZB	Fort's Reagent	15 MINUTES
	MagnaFlux	
	Fry's Reagent	5 MINUTES (total of 20 minutes)
NFGDXW	MagnaFlux	
	Fry's Reagent	5 minutes
NFKV69	Fry's Reagent	Used multiple swabs over a period of approximately 15 minutes. Reagent was only left to sit on very last application for approximately 30 seconds
NFY9K6	MagnaFlux	N/A
	Fry's Reagent	45 MINUTES
NM6VHZ	MagnaFlux	
	Fry's Reagent	1 minute
NPPFA3	Fry's Reagent	2 Minutes
NU6TBP	MagnaFlux	~1 minute each application
	Turner's Reagent	
	Fry's Reagent	
P2XHBQ	Acid Etch Method	15 Mins
P6KWYZ	Davis' Reagent	
	Water	
	Turner's Reagent	
	Water	
	25:1 Nitric Acid	< 10 seconds before positive reaction
PDP4EZ	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	Swiping
PGUZFB	MagnaFlux	
	Davis Reagent	1 minute
	Fry's Reagent	1 minute
PLNRB7	Fry's Reagent	5 minutes
PX3Q3U	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	0.5hr with periodic reapplication
PXE3LD	Acidic Ferric Chloride	2.00

TABLE 4

Recovery Methods		
WebCode	Method	Time
PXJAY8	Davis Reagent	2 minutes
	Turner's Reagent	2 minutes
	Fry's Reagent	1 minute
	Fry's Reagent	2 minutes
Q4J2W4	Acidic Ferric Chloride	90 minutes
	Fry's Reagent	60 minutes
	Acidic Ferric Chloride	45 minutes
QEKE4V	Fry's Reagent	multiple applications of varying times.
QLGCLR	MagnaFlux	
QMV7FR	Davis Reagent	3 total swabs
	Turner's Reagent	3 total swabs
	Fry's Reagent	3 total swabs
	Nitric Acid	3 total swabs
	Fry's Reagent	1 total swab
QRTMU7	Fry's Reagent	
QT2ETU	MagnaFlux	
	Fry's Reagent	10 minutes
	Turner's Reagent	5 minutes
	Davis Reagent	5 minutes
	nitric acid 25%	5 minutes
QTHLWQ	Fry's Reagent	
	Turner's Reagent	
RD93YY	MagnaFlux	
	Fry's Reagent	10 seconds
	Turner's Reagent	10 seconds
	Davis Reagent	10 seconds
	Acidic Ferric Chloride	10 seconds
	Ferric Chloride	10 seconds
RNMC44	MagnaFlux	
	Fry's Reagent	1 min - constant rubbing
	Zinc Alloy Etching Solution - Solution 1	1 min - constant rubbing
RR62JU	Davis Reagent	Three (3) minute
	Turner's Reagent	Two (2) minute
	Fry's Reagent	One (1) minute



TABLE 4

Recovery Methods		
WebCode	Method	Time
RRK68R	MagnaFlux	
	Fry's Reagent	10 minutes
	20% Nitric Acid	3
	Fry's Reagent	10 minutes
	Acidic Ferric Chloride	10 minutes
RVQXER	Acid Etch Method	Davis Reagent - Approximately 5 minutes
	Turner's Reagent	Approximately 2 minutes
	Fry's Reagent	Approximately 1 minute
	Turner's Reagent	Approximately 2 minutes
RYHCT2	MagnaFlux	
	Fry's Reagent	
RZJ38W	MagnaFlux	
	Fry's Reagent	
T4CJXV	Acidic Ferric Chloride	few seconds
T72PZK	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	30 minutes total
T7XZZT	MagnaFlux	
T7ZXL6	MagnaFlux	N/A
	Sanding (grit #120)	N/A
	MagnaFlux	N/A
	Turner's Reagent	N/A
	Davis	N/A
	Fry's Reagent	N/A
T97DY3	MagnaFlux	
TA4NU7	Fry's Reagent	several application with each left on for about 1 minute
TD2AH3	Fry's Reagent	10s x 7 times
TV3CY8	MagnaFlux	
	Acid Etch Method	2 hours
	Turner's Reagent	2 hours
	Fry's Reagent	10 minutes
	MagnaFlux	

TABLE 4

Recovery Methods		
WebCode	Method	Time
TW9AD2	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	10-40 minutes
	Turner's Reagent	1-10 minutes
	25% Nitric Acid	1-2 minutes
	H2O	1 minute to neutralize and discolor metal for photo
TY3NV8	MagnaFlux	
	Fry's Reagent	periodic wiping, diluted with water.
U3X7GH	Fry's Reagent	a few minutes
	Turner's Reagent	a few minutes
	Fry's Reagent	a few minutes
	Turner's Reagent	an hour
	Fry's Reagent	a few minutes
	Turner's Reagent	at least six hours
U8VY63	MagnaFlux	
U9ZQQN	MagnaFlux	N/A
	Fry's Reagent	5 min
UA2JT3	MagnaFlux	
UARTD4	MagnaFlux	
	Fry's Reagent	15 minutes
	Acid Etch Method	30-60 minutes (multiple coats)
UAV767	Davis Reagent	2 swabs, a few seconds per swab.
	Turner's Reagent	2 swabs, a few seconds per swab.
	Fry's Reagent	20 swabs, a few seconds per swab.
UBAXV2	Fry's Reagent	N/A
	Davis	N/A
UGCCQW	Fry's Reagent	5 minutes
UM6WY2	MagnaFlux	
	Fry's Reagent	a few minutes
UULVNQ	Fry's Reagent	30 seconds
	Fry's Reagent	30 seconds
	Fry's Reagent	30 seconds
	Fry's Reagent	30 seconds
	Fry's Reagent	30 seconds

TABLE 4

Recovery Methods		
WebCode	Method	Time
UVWCN6	Magnetic Particle Inspection (MPI)	
	Davis Reagent	Approx. 30 seconds at a time
	Turner's Reagent	Approx. 30 seconds at a time
	Fry's Reagent	Approx. 30 seconds at a time
V83WBV	MIPRO	5 minutes
V8LJ8R	Acid Etch Method	5 minutes
	Magnetic Particle Inspection (MPI)	
V92B93	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	10-15 minutes
VE6GJY	MagnaFlux	
VEK4AM	Acid Etch Method	25% Nitric
	Fry's Reagent	
VEPX2L	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	2 minutes total
VGC7XN	MagnaFlux	
	Fry's Reagent	10 minutes
	Turner's Reagent	5 minutes
VGDYWW	Fry's Reagent	
	Nitric Acid	
	Mipro-Acier	
VR8FGQ	MagnaFlux	
VR9A43	Fry's Reagent	1-2 Minutes
	Acidic Ferric Chloride	1 Minute
W9EW64	MagnaFlux	
	Acid Etch Method	Davis - several minutes using a swapping technique.
WFU83H	Griffin Reagent	3 min x 5
	Acidic Ferric Chloride	3 min x 2
	MagnaFlux	

TABLE 4

## Recovery Methods

<b>WebCode</b>	<b>Method</b>	<b>Time</b>
WHHERL	MagnaFlux	
	DREMEL	
	Fry's Reagent	~60 minutes
	DREMEL	
	Nitric Acid	~60 minutes
	DREMEL	
	Fry's Reagent	~30 minutes
	Nitric Acid	~30 minutes
WKLNN4	Acid Etch Method	Davis- 10- 20 seconds
	Turner's Reagent	10-20 seconds
	Fry's Reagent	10-20 seconds
WKQJDN	MagnaFlux	
	Fry's Reagent	5 min
	Acidic Ferric Chloride	5min
	sodium hydroxide	
WPHYUG	Fry's Reagent	Continual swiping, approximately 5 minutes or less
WT4D9X	Fry's Reagent	
X2T6AW	Fry's Reagent	3×30min
X343PY	MagnaFlux	
	Turner's Reagent	45 minutes
	Fry's Reagent	25 minutes
X9THGR	MagnaFlux	
	Nitric Acid	10 min - alternating with nitric/phosphoric acid
	Nitric/Phosphoric Acid	10 min - alternating with nitric acid
	Fry's Reagent	3 min
XANTYT	Magnetic Particle Inspection (MPI)	
	Davis's Reagent	~5 minutes
	Polish	
	Magnetic Particle Inspection (MPI)	
	Davis's Reagent	~15 minutes
XCWDZU	Fry's Reagent	applied with swab and swiped over the course of several hours
	25% Nitric acid	2 minutes
	Fry's Reagent	applied with swab and swiped over the course of 30 minutes

TABLE 4

Recovery Methods		
WebCode	Method	Time
XG8W9F	Fry's Reagent	10 second increments multiple times
	25% Nitric Acid	~10 seconds
XGND2N	MagnaFlux	
	Davis' Reagent	45 sec
	Fry's Reagent	45 sec
XJBRPX	MagnaFlux	
	Acid Etch Method	Davis Reagent for ~1 minute
	Fry's Reagent	between 25 and 30 minutes
XUQDMK	MagnaFlux	
	Fry's Reagent	
	Turner's Reagent	
	Davis	
XV7BJQ	MagnaFlux	One minute
	Fry's Reagent	One minute
	Davis	One minute
	Turner's Reagent	One minute
	Davis	One minute
	Turner's Reagent	One minute
XX7C7L	MagnaFlux	30 seconds
	MagnaFlux	30 seconds
	MagnaFlux	30 seconds
	Fry's Reagent	30 seconds
	Fry's Reagent	30 seconds
XY4UJ4	Fry's Reagent	20 minutes
XZFN2P	Magnetic Particle Inspection (MPI)	
XZYGR2	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	not timed
Y28C7H	Acid Etch Method	Davis x 5 minutes (multiple passes)
	Fry's Reagent	Fry's x 5 minutes (multiple passes)
	Acid Etch Method	25% Nitric x 2 minutes (multiple passes)
Y2MXCD	Magnetic Particle Inspection (MPI)	
	Davis	25-30 seconds
	Turner's Reagent	25-30 seconds
	Fry's Reagent	1 - 1 1/2 minute

TABLE 4

## Recovery Methods

<u>WebCode</u>	<u>Method</u>	<u>Time</u>
Y8URNH	MagnaFlux	
	Davis reagent	5 mintues
	Turner's Reagent	5 minutes
	Fry's Reagent	45 minutes
YA2KPN	MagnaFlux	
	Acid Etch Method	(Davis') 5 min
	Turner's Reagent	5 min
	Fry's Reagent	5 min
YERN9Y	MagnaFlux	N/A
	Sanding	N/A
	Davis	N/A
	Davis	N/A
	Fry's Reagent	N/A
	Sanding	N/A
YLUQDZ	MagnaFlux	
	Fry's Reagent	5 minute intervals (x10)
YMNRLP	Fry's Reagent	30 min.
YV6TYZ	MagnaFlux	
	Fry's Reagent	6 applications, ~3 minutes each
YVGUGT	Magnetic Particle Inspection (MPI)	
	MagnaFlux	
	Turner's Reagent	Few seconds at a time
	Fry's Reagent	Few seconds at a time
YVXX38	MagnaFlux	Tried red and black
	Fry's Reagent	Acid was continually worked onto surface with cotton applicator until final results. Process took close to 3 hours.
	Acidic Ferric Chloride	Used for highlighting results
YZRR3U	Magnetic Particle Inspection (MPI)	
	Acid Etch Method	on and off for several minutes
Z2HC76	Electro-acid	1 min
Z3DGUQ	MagnaFlux	
	Fry's Reagent	2-3 seconds
Z8NCWF	Turner's Reagent	
	Davis' Reagent	
	MagnaFlux	
	Fry's Reagent	

TABLE 4

Recovery Methods		
WebCode	Method	Time
Z96GJL	Davis Reagent	20
	Turner's Reagent	15
	Fry's Reagent	10
ZAUUXW	MagnaFlux	
	Turner's Reagent	2 minutes
	Fry's Reagent	20 minutes
ZC6RFL	Davis Reagent	5 minutes
	Turner's Reagent	10 minutes
	Fry's Reagent	8 minutes
ZDU7TW	Turner's Reagent	2 hours
	Fry's Reagent	1 hour
ZGX9UE	Fry's Reagent	
ZTFRH	Davis	
	Turner's Reagent	
	Fry's Reagent	
ZWTQNH	Turner's Reagent	approx. 2 mins
	Fry's Reagent	approx. 3 mins
	Fry's Reagent	approx. 3-5 mins
	Fry's Reagent	approx. 1 min
	Fry's Reagent then 10% nitric acid	approx. 1 min
ZYF6CT	Turner's Reagent	Approximately 30 minutes
	Nitric Acid 25%	Approximately 30 minutes
	Fry's Reagent	Approximately 30 minutes
	Nitric Acid 25%	Approximately 30 minutes
	Fry's Reagent	Approximately 30 minutes

Response Summary		Participants: 278
Recovery Methods		
Chemical Processing:	247	
Magnetic Processing:	143	
<p>Note: Participants may use more than one sample recovery method therefore the total number of preparation methods used may not be equivalent to the total number of participants.</p>		

# Additional Comments

## TABLE 5

WebCode	Additional Comments
29X2FH	TECHNICAL NOTES: Serial number restoration is dependent upon multiple factors to include the original stamping/engraving method, material type, obliteration method, and depth of material removed. The reported characters convey only the appearance of characters or partial characters that the examiner observed after the application of standard serial number restoration techniques. These characters are not considered absolute to the exclusion of other possible characters with similar shape or form.
2YVXHV	First, the magnetic method was applied to start with the least destructive procedure and then the most destructive.
3AP8JG	It would be nice to know the SN structure on the instructions.
3VRZQL	Item 1 was referred to as Item 01-01 due to use of laboratory's internal LIMS system designations in the case record.
3Z2QXE	THE RESULTS WERE SUCCESSFULLY PHOTOGRAPHED.
4EY9ZX	When acidic method was used wasn't the acid left on the material for 30 minutes constantly. The process was interrupted several times when examining the developing process.
4JC32P	The arrow provided for orientation purposes on the Item 1 cold rolled steel bar stock could be made clearer in the future. The directions do not indicate which way the arrow points in regards to the serial number's orientation. For example: it could be pointing to the top of the serial number, the bottom of the serial number, or it could be indicating which way the serial number reads (left to right). Without restoring a character with a clearly defined orientation, it could be possible to read the serial number the wrong way. For example: if the only character that could be restored is a 6, that could be read as a 6 one way, but could also be read as a 9 if the bar were flipped the other way. The directions could also indicate whether or not the characters provided on the aluminum standard are the only characters that can possibly be restored, or if other characters not on the aluminum standard could possibly have been used in the serial number.
4PCLYE	the piece of metal was heated with the electromagnet.
4VLDFJ	The results of the MagnaFlux application were verified with applications of Fry's and Turner's etchants.
66MXFQ	single piece of cold rolled steel with an apparent obliterated serial number. The location of the apparent serial number has been milled away. The milled area was polished to remove tool marks; starting with 220 grit with oil followed by 400 grit with oil and 600 grit with oil. Magnetic particle was tested on the cold rolled steel following polishing, the black solution was used with the medium sized horseshoe magnet placed on the back side of the cold rolled steel. The particles reacted to the magnetic field and revealed the obliterated serial number to read: 6C1KF5 The magnetic particle solution was cleaned off and the area was acid etched using Fry's reagent. The acid etching revealed the obliterated serial number to read: 6C1KF5 During the acid etching process there was a instance in which the C had a faint resemblance to a 0, however the magnetic particle clearly showed a C and the continued acid etching clearly shows a C. The Fry's reagent had precipitate floating within solution, it was tested on an area of the cold rolled steel and reacted as expected.



TABLE 5

WebCode	Additional Comments
7KH63E	The placement of the arrow was a good addition.
APXGFB	TECHNICAL NOTES: Serial number restoration is dependent upon multiple factors to include the original stamping/engraving method, material type, obliteration method, and depth of material removed. The reported characters convey only the appearance of characters or partial characters that the examiner observed after the application of standard serial number restoration techniques. These characters are not considered absolute to the exclusion of other possible characters with similar shape or form.
ATXRCB	Serial number restoration is dependent upon multiple factors to include the original stamping/engraving method, material type, obliteration method, and depth of material removed. The reported characters convey only the appearance of characters or partial characters that the examiner observed after the application of standard serial number restoration techniques. These characters are not considered absolute to the exclusion of other possible characters with similar shape or form.
B2KMTK	Although the magnetic method was satisfactory in revealing the obliterated sequence; the acid and FRY method was performed for double corroboration of the sequence and also the acid-FRY method that is used more in our work area.
BKXR93	A stereomicroscope equipped with ring light and camera were used in order to assist in visualizing and documenting the recovered characters.
CPQMFM	Successful positive controls were performed using Fry's Reagent and 25% Nitric Acid on a steel metal bar.
DFGLUL	The last digit (5) was little visible in the restoration.
DPMDA9	The directional arrow was very helpful.
EBZTZY	upon analysis, I am opinion the obliterated serial number on cold rolled steel was restored and intepreted as "6C1KF5".
FK7TD7	I liked having the stamped arrow to show the approximate location where the restored serial number should be. 2nd character "C" was similar to a "G" but after further processing there was not horizontal line that would indicate it was a "G" 5th character "F" did not have a lower horizontal line develop indicating that is was a "F" and not a "E".
GAWH4Y	Our electro-acid equipment was broken so we had no chance to use that as a recovery method. Normaly we use both Magnaflux and electro-acid etching alternated.
HHCQH3	The obliterated area was sanded with 400 and 1500 grit sandpaper until mirror-like finish. After first application of Fry's chemical reagent waited approximate three minutes and the serial number was partially visible. The obliterated area was sanded and treated with Fry's chemical reagent for a second time, waiting approximate another three minutes and the serial number was restored. (6C1KF5) A third application was done to ensure the result of the findings.
J4N7DY	TWO DEVELOPMENT METHODS ARE USED: ELECTROMAGNETIC: The characters were not well observed and one of them could not be determined. The development was slow (greater than 30 minutes). CHEMICAL: With this method it was very fast (less than 5 minutes) and the contours of the characters were observed very well.

TABLE 5

WebCode	Additional Comments
JD9266	Fry's is my normal primary solution, but this time, I tried the Nitric Acid at the end, and I liked the results. I'll probably use it more in the future.
JEN4CD	Manufacture of this test specimen had poor quality control. The bar stock appeared to have not been properly secured during milling. The path the end mill took started perpendicular to the bar stock during cutting but then wandered off course to one side as it approached the other side of the bar stock.
K2DPBL	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 Restoration Except for 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.
KBZAQW	The arrow used to determine direction of orientation is not defined in the directions (which way it is to be pointing to have the correct orientation, down or up?).
KPLCG4	MagnaFlux was used at the end to highlight the serial number characters. To be able to confirm the number and to photograph the final result.
LAMWLZ	Technical Notes: Serial number restoration is dependent upon multiple factors to include the original stamping/engraving method, material type, obliteration method, and depth of material removed. The reported characters convey only the appearance of characters or partial characters that the examiner observed after the application of standard serial number restoration techniques. These characters are not considered absolute to the exclusion of other possible characters with similar shape or form.
MRZZKX	TECHNICAL NOTES: Serial number restoration is dependent upon multiple factors to include the original stamping/engraving method, material type, obliteration method, and depth of material removed. The reported characters convey only the appearance of characters or partial characters that the examiner observed after the application of standard serial number restoration techniques. These characters are not considered absolute to the exclusion of other possible characters with similar shape or form.
MTX2VX	The acid was cleaned with delicated task wipers, constantly, to write down the characters appearing during each step.
PXJAY8	After applying each reagent, a photograph of the steel bar was taken. After applying the Fry's reagent for 1 minute, characters started to appear on the bar. The bar was again photographed and then additional Fry's reagent was applied to the bar to finish the restoration.
RR62JU	Acid was cleaned with delicate task wipers constantly to white down the characters appearing during each step. After the restoration process, sodium bicarbonate solution was used to neutralize acid residues on the surface.
TA4NU7	Nitric acid was occasionally applied as a highlighter.

TABLE 5

WebCode	Additional Comments
U8VY63	Visual inspection and cleaned surface with acetone prior to restoration.
UAVFQB	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.
VG DYWV	probable alteration of serial number by milling and then by grinding.
VR9A43	The defaced bar stock (Item 1) was physically/chemically processed. Its serial number was restored to read: 6C1KF5.
X343PY	After having limited success with Turner's reagent alone, Turner's reagent was combined with Fry's reagent. Fry's reagent was not used by itself.
XGND2N	Technical Notes: Serial number restoration is dependent upon multiple factors to include the original stamping/engraving method, material type, obliteration method, and depth of material removed. The reported characters convey only the appearance of characters or partial characters that the examiner observed after the application of standard serial number restoration techniques. These characters are not considered absolute to the exclusion of other possible characters with similar shape or form.
XJBRPX	One of the characters in the serial number was still visible from the start (1). Magnaflux was used first but no characters appeared. Then sandpaper was used to smooth out the damage on the surface of the serial number. Davis' Reagent was the first etching solution used for only a minute. There was a reaction with the steel surface but a weak reaction. Next, Fry's Reagent was used and a much stronger reaction occurred with the steel surface. With continual application of Fry's Reagent for approximately 30 minutes, the obliterated serial number was restored.
Z2HC76	The serial number on this material consists of 6 characters: 6C1KF5.
Z96GJL	The magnet was used to determine magnetic properties and magnifying glass used for inspection.
ZYF6CT	This sample is very poor. It is difficult to determine the 4th character "K" or "N". It took me two days just to determine the character as "K". I believed the obliteration methods used make it difficult to distinguish certain letters with similar structures.

-End of Report-  
(Appendix may follow)

Collaborative Testing Services ~ Forensic Testing Program

**Test No. 22-5250: Serial Number Restoration**

DATA MUST BE SUBMITTED BY **March 21, 2022, 11:59 p.m.** TO BE INCLUDED IN THE REPORT

Participant Code: U1234A

WebCode: NWNZG4

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.*

*-An arrow symbol has been stamped on the Item 1 barstock to distinguish orientation.*

**Items Submitted (Sample Pack SNR1):**

Item 1: A piece of cold rolled 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)