



## Serial Number Restoration Test No. 18-5250 Summary Report

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This test was sent to 327 participants. Each participant received a sample pack containing a piece of steel bar stock which had been stamped with a six character serial number which was then obliterated. Also included was a piece of aluminum bar stock intended as a standard for the size, shape and positioning of the stamped characters. Participants were asked to restore the obliterated serial number. Data were returned from 296 participants and are compiled into the following tables:

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

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

## **Manufacturer's Information**

Each sample set 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 (K1J9D6).

### **SAMPLE PREPARATION:**

Each sample set contained a piece of steel bar stock that was stamped with 6 characters (K1J9D6). The serial number was then obliterated by a milling machine.

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

### **SAMPLE SET ASSEMBLY:**

An Item 1 bar stock was enclosed in chip board and the sides taped to securely contain the sample. The aluminum standard was enclosed in chip board and both were placed in their respective pre-labeled envelopes. Each sample pack was packaged with 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:**

Two of the three predistribution laboratories restored the obliterated six character serial number and reported "K1J9D6". The remaining predistribution laboratory restored five of the six characters and reported "K1J906". Two laboratories used a chemical restoration method for recovery and one laboratory used a magnetic and chemical restoration method for recovery.

## **Summary Comments**

This test was designed to allow participants to assess their proficiency in the restoration of an obliterated serial number. Participants were provided with a piece of 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 6 characters (K1J9D6). (Refer to Manufacturer's Information for preparation details.)

Of the 296 responding participants in Table 1: "Recovered Characters", 272 (92%) recovered the six characters consistent with the Manufacturer's Information. Twenty-one participants restored five of the six characters, two participants reported four of the six characters and one participant restored three of the six characters. It was noted that most of these 24 participants reported characters that were different from, but similar in shape to, the expected characters (e.g. sixteen participants reported "0" and one "D/0" instead of "D").

In Table 3: "Sample Preparation", the majority of participants used polishing, sanding or visual methods to prepare their sample. In Table 4: "Recovery Methods", a vast majority of participants used chemical processing for the serial number restoration.

# 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
2AG8AP	K	1	J	9	D	6
2BVK6D	K	1	J	9	D	6
2F8GJN	K	1	J	9	D	6
2J9F3T	K	1	J	9	D	6
2KYLED	K	1	J	9	D	6
2LEY7V	K	1	J	9	D	6
2Q77LH	K	1	J	9	D	6
2UW8VD	K	1	J	9	D	6
2Y6V3M	K	1	J	9	D	6
3AE79X	K	1	J	9	D	6
3FK2RX	K	1	J	9	D	6
3HDDTH	K	1	J	9	D	6
3HE6P6	K	1	J	9	D	6
3HYL8T	K	1	J	9	D	6
3J3LWR	K	1	J	9	D	6
3KGKUW	K	1	J	9	D	6
3MHNLJ	K	1	J	9	D	6
3NM9XR	K	1	J	9	D	6
3VX83X	K	1	J	9	D	6
3YKEMK	K	1	J	9	D	6
3YXZ2R	K	1	J	9	D	6
43R9U2	K	1	J	9	D	6

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
44P66Q	K	1	J	9	D	6
4FZ3EQ	K	1	J	9	0	6
4JJZ3G	K	1	J	9	D	6
4NBDGP	K	1	J	9	D	6
4VWUXG	K	1	J	9	D	6
4W89GA	K	1	J	9	D	6
4ZBRTA	K	1	J	9	D	6
67VAMB	K	1	J	9	D	6
68NJQV	K	1	J	9	D	6
69HUN9	K	1	J	9	D	6
6DTME9	K	1	J	9	D	6
6HL4Y6	K	1	J	9	D	6
6KAXR9	K	1	J	9	D	6
6LN3AX	K	1	J	9	D	6
6RRQHY	K	1	J	9	D	6
6VB69K	K	1	J	9	D	6
6W6PJX	K	1	J	9	D	6
6Y8PEP	K	1	J	9	D	6
6ZMTAG	K	1	J	9	D	6
72Y79X	K	1	J	9	D	6
778KNM	K	1	J	9	D	6
77MQCD	K	1	J	9	D	6
79VZ7V	K	1	J	9	D	6
7B4XV7	K	1	J	9	D	6

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
7CTBAH	K	1	J	9	D	6
7KTLQ9	K	1	J	9	D	6
7MUUVJ	K	1	J	9	D	6
7QBA6B	K	1	J	9	D	6
7R8JBL	K	1	J	9	D	6
7VQNQW	K	1	J	9	D	6
7WWM3Y	K	1	J	9	D	6
7XXW4M	K	1	J	9	D	6
7ZGY3F	K	1	J	9	D	6
828XUT	K	1	J	9	D	6
88ELAF	K	1	J	9	D	6
88G37J	K	1	J	9	D	6
89TE9U	K	1	J	9	D	6
8K4HBD	K	1	J	9	D	6
8KLUG4	K	1	J	9	D	6
8KMLCQ	K	1	J	9	D	6
8QR9VN	K	1	J	9	D	6
8Y943A	K	1	J	9	D	6
93VJFL	K	1	J	9	D	6
94UJ6L	K	1	J	9	D	6
98TUZL	K	1	J	9	D	6
98WJZC	K	1	J	9	D	6
9DJ7X3	K	1	J	9	0	6
9E9KCE	K	1	J	9	D	6

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
9F63BV	K	1	J	9	D	6
9N2QDT	K	1	J	9	D	6
9Q92FN	K	1	J	9	D	6
9UNT3B	K	1	J	9	D	6
9UPHGF	K	1	J	9	D	6
9WCC2M	K	1	J	9	D	6
9WDXZN	K	1	J	9	D	6
A87L3B	K	1	J	9	D	6
A9L6BE	K	1	J	9	D	6
ABQTQ4	K	1	J	9	D	6
ADDCR2	K	1	J	9	D	6
ADTMHU	K	1	J	9	D	6
ADX6HD	K	1	J	9	D	6
AFLN94	K	1	J	9	D	6
ALNQFP	K	1	J	9	D	6
AQJ6WU	K	1	J	9	D	6
AQPMGD	K	1	J	9	D	6
ARVKQU	K	1	J	9	D	6
AUNZ3G	K	1	J	9	D	6
AX3X8J	K	1	J	9	D	6
B3QUEL	K	1	J	9	D	6
BBNMNZ	K	1	J	9	D	6
BDBMXY	K	1	J	9	D	6
BGPTDB	K	1	J	9	D	6

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
BKAN8V	K	1	J	9	D	6
BL687C	K	1	J	9	D	6
BN8879	K	1	J	9	D	6
BQEG9D	K	1	J	9	D	6
BQVQ7L	K	1	J	9	D	6
BRNLL3	K	1	J	9	D	6
BTNTCJ	K	1	J	9	D	6
BV6HBM	K	1	J	9	0	6
BXZFRZ	K	1	J	9	D	6
C8GM4U	K	1	J	9	D	6
CA7BJB	K	1	J	9	D	6
CA8N9H	K	1	J	9	D	6
CAQCTX	K	1	J	9	D	6
CG86JM	K	1	J	9	D	6
CLHA4B	K	1	J	9	D	6
CN7E7F	K	1	J	9	D	6
CUBURQ	K	1	J	9	D	6
CWFJUZ	K	1	J	9	D	6
D6AKNN	K	1	J	9	D	6
DA7ZJQ	K	1	J	9	D	6
DAYNGM	K	1	J	9	D	6
DBGYFL	K	1	J	9	D	6
DBUFRD	K	1	J	9	D	6
DDY9JR	K	1	J	9	D	6



TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
DFN2JB	K	1	J	9	D	6
DLXLPL	K	1	J	9	D	6
DNLBVK	K	1	J	9	D	6
DX9ALQ	K	1	J	9	D	6
DY6AHQ	K	1	J	9	D	6
E3Z28R	K	1	J	9	D	6
E4VJ89	K	1	J	9	D	6
E6Q3DF	K	1	J	9	D	6
E8A4C9	K	1	J	9	D	6
E8TZJ3	K	1	J	9	D	6
EC8DQG	K	1	J	9	D	6
EP9RGM	K	1	J	9	D	6
ER28WF	K	1	J	9	D	6
ERJ2TJ	K	1	J	9	D	6
ERLJZV	K	1	J	9	0	6
EW8JMV	K	1	J	9	D	6
EXNXDJ	K	1	J	9	D	6
F4PENP	K	1	J	9	D	6
F66VK4	K	1	J	9	D	6
F93CVC	K	1	J	9	D	6
F946V6	K	1	J	9	D	6
FCKJBY	K	1	J	9	D	6
FGWF8L	K	1	J	9	D	6
FHUMCY	K	1	J	9	D	6

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
FLQCR7	K	1	J	9	D	6
FRV6UN	K	1	J	9	D	6
FWCDB2	K	1	J	9	D	6
FYRNWE	K	1	J	9	D	6
G8N6D2	K	1	J	9	D	6
GCWTMW	K	1	J	9	D	6
GDTYAH	K	1	J	9	D	6
GJKB8Z	K	1	J	9	D	6
GLADDM	K	1	J	9	D	6
GQWAVJ	K	1	J	9	D	6
GR8CGH	K	1	J	9	D	6
GUGGYC	K	1	J	9	D	6
GXCXLE	K	1	J	9	D	6
H3NBVQ	K	1	J	9	D	6
H3NF48	K	1	J	9	D	6
H6CR3D	K	1	J	9	D	6
H9RC2L	K	1	J	9	D	6
HE4BJ8	K	1	J	9	D	6
HEW8KL	K	1	J	9	D	6
HHKQVK	K	1	J	9	D	6
HJUQMK	K	1	J	9	0	6
HL46GF	K	1	J	9	D	6
HRL8DA	K	1	J	9	D	6
HWL7G	K	1	J	9	D	6

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
JF7232	K	1	J	9	D	6
JFTRGL	K	1	J	9	D	6
JPK7A	K	1	J	9	D	6
JLW367	K	1	J	9	D	6
JNKRPT	K	1	J	9	D	6
JU89UG	K	1	J	9	D	6
JVP7GF	K	1	J	9	D	6
JWVTRY	K	1	J	9	D	6
K26D8J	K	1	J	9	D	6
K73MNC	K	1	J	9	D	6
K9MLVF	K	1	J	9	D	6
KBVU6Z	K	1	J	9	D	6
KDZMUR	K	1	J	9	0	6
KH9W2Z	K	1	J	9	D	6
KLQ69Z	K	1	J	9	D	6
KU6RKP	K	1	J	9	D	6
L3VRHE	K	1	J	9	D	6
LDCHXC	K	1	J	9	0	6
LERZYW	K	1	J	9	D	6
LGH26K	K	1	J	9	D	6
LH8FKG	K	1	J	9	D	6
LJ84A9	K	1	J	9	D	6
LKUYJU	K	1	J	9	D	6
LKWGTQ	K	1	J	9	D	6

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
LL6T98	K	1	J	?	D	6
LMJFNZ	K	1	J	9	D	6
LQ3DCQ	K	1	J	9	D	6
LZK4NG	K	1	J	9	D	6
M464TN	K	1	J	9	D	6
M4L7DH	K	1	J	9	0	6
M4PWCD	K	1	J	9	0	6
MABWJD	K	1	J	9	D	6
MH8UBM	K	1	J	9	D	6
MJ2HRX	K	1	J	9	D/O	6
MRRGFR	K	1	J	9	D	6
MUWQAZ	K	1	J	9	D	6
N36XNN	K	1	J	9	D	6
N42ZE4	K	1	J	?	?	6
N76UDA	K	1	J	9	D	6
NCWEEE	K	1	J	9	D	6
NHZU27	K	1	J	9	D	6
NPK3A4	K	1	J	9	D	6
NPYKDA	K	1	J	9	D	6
NTJJKC	K	1	J	9	D	6
P37UFP	K	1	J	9	D	6
P3MVG7	K	1	J	9	D	6
PCQJ9D	K	1	J	9	0	6
PDJFVL	K	1	J	9	D	6

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
PEVRGM	K	1	J	9	D	6
PKZJJ7	K	1	J	9	D	6
PR9U67	K	1	J	9	0	6
PZFB97	K	1	J	9	D	6
Q3GUCJ	K	1	J	9	D	6
QDJCMM	K	1	J	9	D	6
QGY8LE	K	1	J	9	D	6
QHQUU2	K	1	J	9	D	6
QM4PKX	K	1	J	9	D	6
QNZ2K7	K	1	J	9	D	6
QPVYU9	K	1	J	9	D	6
QRXZU6	K	1	J	9	D	6
QTWKQB	K	1	J	9	D	6
QWM9UV	K	1	J	9	D	6
R3GEED	K	1	J	9	D	6
R47RVA	K	1	J	9	D	6
R4A8BW		1	J	9	D	6
R64DPB	K	1	J	9	0	6
R7CCLV	K	1	J	9	D	6
RBAA9B	K	1	J	9	D	6
RNFK7P	K	1	J	9	D	6
RQL36K	K	1	J	9	0	6
RQZR7C	K	1	J	9	D	6
RTP6LA	K	1	J	9	D	6

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
T3BJ9C	K	1	J	9	D	6
T3QPN2	K	1	J	9	D	6
T4ZWPA	K	1	J	9	D	6
T7MFNL	K	1	J	9	D	6
T9BUBB	K	1	J	9	D	6
T9FCBU	K	1	J	3	0	6
TDPKMW	K	1	J	9	D	6
TME9GZ	K	1	J	9	D	6
TNBZPA	K	1	J	9	D	6
TT92VN	K	1	J	9	D	6
TWNFHA	K	1	J	9	D	6
U7LZX8	K	1	J	9	D	6
UE48XK	K	1	J	9	D	6
UEFGN7	K	1	J	9	D	6
UEKJFP	K	1	J	9	D	6
UG83F2	K	1	J	9	D	6
UGNU9T	K	1	J	9	D	6
UH2QZH	K	1	J	9	D	6
UKMAGG	K	1	J	9	D	6
URNPN3	K	1	J	9	D	6
UT4434	K	1	J	9	D	6
UUHDAJ	K	1	J	9	D	6
V7KGT4	K	1	J	9	D	6
V8YMDZ	K	1	J	8	D	6

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
VBZVFP	K	1	J	9	0	6
VR2BFQ	K	1	J	9	D	6
VWJVPQ	K	1	J	9	D	6
W92AY4	K	1	J	9	D	6
WEVZQ9	K	1	J	*	D	6
WGMV68	K	1	J	9	D	6
WJ63UP	K	1	J	9	D	6
WKX3NU	K	1	J	9	D	6
WRH8MA	K	1	J	9	D	6
WU8K48	K	1	J	9	D	6
WWW2BU	K	1	J	9	D	6
X3H2GY	K	1	J	9	D	6
XAFTLL	K	1	J	9	D	6
XDBUEN	K	1	J	9	D	6
XEL3Q4	K	1	J	9	D	6
XND8JU	K	1	J	9	0	6
XNWRQM	K	1	J	9	D	6
XRVLDD	K	1	J	9	D	6
XU3DMW	K	1	J	9	D	6
XZR32E	K	1	J	9	D	6
Y4AFJG	K	1	J	9	D	6
Y4LJNT	K	1	J	9	D	6
Y7CDUA	K	1	J	9	D	6
Y8ANPD	K	1	J	9	0	6

TABLE 1

Recovered Characters						
WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
Y9X8NP	K	1	J	9	D	6
YGQHWY	K	1	J	?	D	6
YKN3FP	K	1	J	9	D	6
YPLLHN	K	1	J	9	D	6
Z39MW4	K	1	J	9	D	6
Z7NNVL	K	1	J	9	D	6
ZK4CRW	K	1	J	9	D	6
ZTHY22	K	1	J	9	D	6
ZY4P3R	K	1	J	9	D	6
ZYMH7B	K	1	J	9	0	6

Response Summary						Participants:296
	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
Consensus	K	1	J	9	D	6
Number	295	294	296	290	276	296
Percent	99.7%	99.3%	100.0%	98.0%	93.2%	100.0%



# Conclusions

TABLE 2

WebCode	Conclusions
2AG8AP	After application of the electro-acid etching process, I determined the serial number of the exhibit as K 1 J 9 D 6.
2BVK6D	The area of obliteration was mechanically polished and chemically etched fully restoring the serial number to: K 1 J 9 D 6.
2F8GJN	The obliterated serial number was restored to read: K 1 J 9 D 6
2J9F3T	The serial number on Item 1 was restored to read K1J9D6.
2KYLED	The serial number of Item 1 was chemically processed and restored to read: K 1 J 9 D 6
2LEY7V	Item 1-1 A piece of 303 stainless steel bar stock with suspected obliterated serial number: Visual examination of this item revealed the presence of polish/grind marks on one side. This area was etched with acid solutions and the following was restored: K 1 J 9 D 6
2Q77LH	Serial number restoration revealed the number K1J9D6.
2UW8VD	The following findings reflect the professional opinion of the examiner authoring this report. Examination of Item 1 revealed one (1) rectangular bar stock. The serial number of Item 1 has been obliterated. Using standard serial number restoration techniques, an attempt was made to restore the serial number with the following results: Serial Number: K1J9D6 was restored on Item 1.
2Y6V3M	The obliterated surface on the steel bar stock (Item 1) was sanded and chemically processed. All characters could have been seen during the examination, but not in same time. Some characters as well disappeared earlier than other ones.
3AE79X	Visual and chemical treatment of the serial number area on the bar stock, Item 1, reveal the following number: K 1 J 9 D 6. The aluminum standard was inspected to verify and document contents. No analysis was performed on the item listed.
3FK2RX	Visual examination and chemical treatment of the serial number area on the bar stock, Item 1A, reveal the following number: K 1 J 9 D 6. Item 1B was inspected to verify and document contents. No analysis was performed on the item listed.
3HDDTH	Item 1 was physically and microscopically examined. The serial number area of Item 1 was prepared and treated with chemical reagents. As a result of these actions, the serial number was restored to read "K1J9D6".
3HE6P6	Visual examination and mechanical and chemical processing of the stainless steel bar stock (Item 1) revealed the obliterated serial number to read: K1J9D6.
3HYL8T	Serial number restoration techniques were applied to Item 1. The serial number was determined to be K1J9D6.
3J3LWR	The serial number on item #1 was restored to read K1J9D6. Item #1A was not examined.
3KGKUW	The obliterated area on Exhibit 1 (bar stock) was visually examined, polished and chemically processed. The characters were restored and appeared as follows: K1J9D6
3MHNLJ	Examination of Item 1 revealed an obliterated area. Standard chemical restoration procedures were utilized and the characters "K1J9D6" were restored.
3NM9XR	The stainless steel bar stock was chemically processed using acid etching technique. The serial number was restored and is "K1J9D6".
3VX83X	1. The obliterated area on Exhibit 1 (metal block) was visually examined and processed using magnetic particle reagent. The characters were restored to read: K 1 J 9 D 6.

TABLE 2

WebCode	Conclusions
3YKEMK	Examination and chemical processing of Item 1 determined that the original obliterated serial number to be "K1J9D6".
3YXZ2R	The Exhibit 1 obliterated serial number was magnetically and chemically processed and was restored to read "K1J9D6".
43R9U2	I examined the steel bar and found that the surface of the bar is filed. Upon electrochemical treatment on the filed surface, the number "K 1 J 9 D 6" was restored. Based on my findings, I am of opinion that "K 1 J 9 D 6" is the original serial number.
44P66Q	The restored serial number was : K1J9D6
4FZ3EQ	After examination and processing the stainless steel bar stock the original obliterated serial number was determined to be K1J906.
4JJZ3G	Serial number restoration revealed the number K1J9D6.
4NBDGP	3. On 2018-02-07 during the performance of my official duties I received a sealed evidence bag with number PA4001477000 from Case Administration of the Ballistics Section, containing the following exhibits: 3.1 One (1) stainless steel bar with serial number removed marked by me "49117/18 A". 3.2 One (1) aluminium bar stamped with alpha-numeric characters not marked by me. 4. The intention and scope of this forensic examination comprise of the following: 4.1 Techniques associated with the recovering and restoration processes of obliterated alpha-numeric figures on metals. 5. After application of the electro-magnetic process, I determined the serial number on the stainless steel bar as K1J9D6.
4VWUXG	The obliterated serial number on item 1 was successfully restored to read "K1J9D6"
4W89GA	The examination and processing of the obliterated serial number on the Item 1 bar stock was restored to read "K1J9D6".
4ZBRTA	The serial number of Item 1 as restored is K1J9D6.
67VAMB	Item 1 was found to exhibit an area of obliteration. The obliteration area was polished and treated with a chemical etchant. This process revealed the following serial number: K1J9D6.
68NJQV	The obliterated area on Exhibit 1 was visually examined and polished. Through non-chemical means the serial number was visually restored and appeared as follows: K1J9D6.
69HUN9	The development process was carried out in the area where it was altered and it waws possible to restoration the alphanumeric sequence corresponding to K1J9D6
6DTME9	I observed a piece of metal that had a portion of the surface machine milled. In this milled area no stamped characters were present. This area was subjected to a serial number restoration and a full recovery of previously hand stamped characters "K1J9D6" was obtained. These numbers appeared to be original when compared to the characters stamped into the aluminium plate.
6HL4Y6	An obliterated area was noted on the metal bar in Item #1. Standard restoration techniques revealed the following characters as the serial number "K1J9D6".
6KAXR9	The serial number on item 1 was restored to K 1 J 9 D 6
6LN3AX	Submitted in small tan envelope marked "Test # 18-5250, Item 1". One stainless steel bar stock with obliterated serial number, rectangular in shape, measuring 2 2/3" x 1". Serial number (K1J9D6) defaced by abrasion, restored using chemical etching method.

TABLE 2

WebCode	Conclusions
6RRQHY	Proficiency test number 18-5250 was commenced on Thursday 1st February 2018, in which a bar stock titled "Test No. 18-5250" was examined. A forensic technique applied to the milled or similar area on the examined bar stock, restored a series of previously stamped characters. These characters read: K1J9D6 The observed restored characters were corroborated by a peer and were consistent in size, shape and style to the characters supplied as a known standard/control on a separate piece of aluminium bar stock titled "Aluminum Standard Test No. 18-5250".
6VB69K	It has been made the serial number restoration and it was observed the serial number K1J9D6
6W6PJX	Serial number was obliterated (deeply abraded), restored using the chemical etching process. CTS number etched on MB1 (Metal Block 1) for identification.
6Y8PEP	From proficiency Test No. 18-5250: Item one: One (1) Stainless steel bar stock with suspected obliterated serial number. Results: Restored serial number appears to be: K 1 J 9 D 6. Results were verified. Item 1 will be maintained in the Firearms evidence storage area. I hereby certify that this is a report of the conclusions of an examination performed by me.
6ZMTAG	Using standard restoration techniques, the obliterated serial number on item 1 (steel bar) was restored to read: "K1J9D6".
72Y79X	Examination of Item #1 revealed one (1) portion of metal bar stock approximately 2 ¾ inches long, 1 inch wide, with reported serial number obliterated. Using standard laboratory restoration techniques, an attempt was made to restore the serial number on Item #1 with the following results: Serial Number: K 1 J 9 D 6 was restored to Item #1.
778KNM	3. On 2018-02-07 during the performance of my official duties I received a sealed evidence bag with number PA4001477001 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) sealed envelope marked "2018 CTS Forensic Testing Program TEST No. 18-5250: SERIAL NUMBER RESTORATION Sample Pack: SNR1" containing the following: 3.1.1 One (1) aluminium standard marked Test No. 18-5250. 3.1.2 One (1) piece of stainless steel bar stock with obliterated serial number marked "Item 1". 4. The intention and scope of this forensic examination comprise of the following: 4.1 Techniques associated with the recovering and restoration processes of obliterated alpha-numeric figures on metals. 5. After application of the electro-magnetic process, I determined the serial number of the bar stock mentioned in paragraph 3.1.2 as K1J9D6.
77MQCD	Using standard laboratory restoration techniques, the obliterated serial number on Item 1 was restored to read "K1J9D6".
79VZ7V	Item #1 restored to "K1J9D6" by examiner using laboratory methods and chemical etching processes. CTS number "18-5250" scribed on back of steel bar by examiner for identification purposes.
7B4XV7	Chemical treatment was successful in chemically restoring a serial number on the bar. The serial number on the bar was restored to read K 1 J 9 D 6.
7CTBAH	After application of the electro-acid and electromagnetic etching process, I determined the serial number of the stainless steel as K1J9D6
7KTLQ9	The restoration process was carried out in stainless steel bar, in the area where it was altered and de sequence "K1J9D6" was restored.
7MUUVJ	The alphanumeric sequence restored in the piece of metal sent as evidence, corresponds to "K1J9D6".
7QBA6B	Item 1 is a piece of bar stock with suspected obliterated serial number. Using standard serial number restoration techniques, the serial number of Item 1 was restored to read K1J9D6.
7R8JBL	After I applied the electro-acid etching process I determined the serial number K1J9D6 on the piece of 303 stainless steel bar stock.
7VQNQW	RECEIVED UNDER PROPERTY# 7VQNQW WAS ONE PIECE OF BAR STOCK WITH AN OBLITERATED SERIAL NUMBER; SAME WAS RESTORED AND WAS DETERMINED TO BE K1J9D6.

TABLE 2

WebCode	Conclusions
7WWM3Y	APPLICATION OF FORENSIC RESTORATION PROCEDURES TO THE MACHINED SURFACE ON THE STAINLESS STEEL BAR STOCK RESTORED A SERIES OF PREVIOUSLY STAMPED CHARACTERS THAT READ K1J9D6
7XXW4M	Serial number obliterated by abrasion. Serial number restored using chemical etching and reads: "K1J9D6".
7ZGY3F	The serial number on the above listed (Item #1) was restored to read K1J9D6.
828XUT	1. Exhibit 1 is a stainless steel bar with a suspected obliterated serial number. 2. The obliterated area on Exhibit 1 was visually examined and mechanically processed. Processing revealed that the original serial number is "K 1 J 9 D 6".
88ELAF	Examination of Item 1 revealed one (1) portion of metal bar stock approximately 1 inch wide, 2 3/4 inches long with reported obliterated serial number. Using physical and chemical restoration techniques, an attempt was made to restore the serial number with the following results: K1J9D6.
88G37J	The grounded surface on the stainless steel bar stock was electrochemically treated and a set of alphanumeric was restored and read as "K1J9D6".
89TE9U	In the area of the determined removal of the stainless steel bar, the following characters could be made visible again: K1J9D6.
8K4HBD	Item 1 (stainless steel bar stock) was examined and found to have an obliterated area. Standard restoration techniques revealed "K1J9D6".
8KLU4	AFTER USE OF OUR STANDARD PROCEDURES FOR OBLITERATED SERIAL NUMBER RESTORATION WE FOUND THE FOLLWING NUMBER (LEFT TO RIGHT): K1J9D6
8KMLCQ	Standard Laboratory Procedures for restoring serial numbers stamped in metal have been employed on the center of this barstock. The serial number was determined to be "K1J9D6".
8QR9VN	The following characters were recovered on item #1: K1J9D6
8Y943A	Item 1 was examined and found to exhibit an obliterated area in the center of the bar stock. The obliterated area was polished and treated with a chemical etchant. This process revealed the following serial number: K1J9D6.
93VJFL	3. On 2018-02-08 during the performance of my official duties I received a sealed evidence bag with number PA4001476998 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) stainless steel bar with suspected obliterated number marked by me "49141/18 1". 3.2 One (1) aluminium reference bar (not marked by me). 4. The intention and scope of this forensic examination comprise the following: 4.1 Techniques associated with the recovering and restoration processes of alpha-Numeric figures on metals. 5. After application of the electro-magnetic etching process I determined the number of the bar mentioned in paragraph 3.1 as K1J9D6.
94UJ6L	The serial number is milled off. The serial number (K1J9D6) was restored by the acid etching process. Polishing, Modified Fry's and Nickels & Alloys reagents 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 held in the Firearm Section's Evidence Room.
98TUZL	The serial number is milled off. The serial number (K1J9D6) was restored by the acid etching process. 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. Disposition: This item will be held in the Firearm's Section Evidence Room.
98WJZC	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: K1J9D6
9DJ7X3	Following application of the electro magnetic process, I determined the serial number as 'K1J906'.

TABLE 2

WebCode	Conclusions
9E9KCE	I HAVE USED THE SAND PAPER TO CLEAN OR FILLING THE OBLITERATED SURFACE THEN I HAVE PUT THE METAL ON THE ELECTRO MAGNETIC PROCESS AND APPLIED THE BLACK INK AND WHITE POLISH THEN THE NUMBER WAS NOT CLEAR ENOUGH THEN I HAVE USED ELECTRO ACID ETCHING PROCESS THEN I DETERMINED THE SERIAL NUMBER OF STAINLESS STEEL METAL AS K1J9D6.
9F63BV	THE STAMPED ALPHANUMERIC CHARACTERS OF THE PIECE OF STAINLESS STEEL LABELED AS "SAMPLE PACK: SNR1", WERE RECOVERED TOTALLY AND ARE AS FOLLOWS K1J9D6
9N2QDT	Examination and chemical processing of the obliterated serial number on item A was restored and determined to be "K1J9D6".
9Q92FN	Serial number restoration techniques were applied to Item #1. The serial number was determined to be K1J9D6.
9UNT3B	Using standard laboratory techniques the obliterated serial number was restored to read K 1 J 9 D 6.
9UPHGF	after the application of the electro-acid and electro magnetic process, i determined the serial number of the steel bar as K1J9D6
9WCC2M	The serial number has been restored successfully and appeared clearly and entirely.
9WDXZN	Serial number restoration techniques were applied to Item 1. The serial number was determined to be K1J9D6.
A87L3B	Examination of Item #1 revealed an obliterated area on the front side. Standard chemical restoration revealed the following characters: "K1J9D6".
A9L6BE	Examination and chemical processing of Ex. 1 restored the obliterated serial number to read "K 1 J 9 D 6".
ABQTQ4	The serial number was visualized with magnetic particles and found to be: K1J9D6.
ADDCR2	The serial number, located at the center of the stainless steel bar stock, appeared to have been deliberately obliterated through grinding. I used magnetic particle inspection technique to successfully restore the following serial number: K 1 J 9 D 6 Digital images were taken during the restoration. All of the digital images are included in the case notes.
ADTMHU	Using standard laboratory restoration techniques, it was determined that the obliterated serial number on Exhibit 001-01 was restored to read "K1J9D6". No examinations were performed on Exhibit 001-02, aluminum standard.
ADX6HD	After application of the electro-acid etching process, I determined the serial number of the exhibit marked (1) possibly as K1J9D6.
AFLN94	Alphanumeric sequence "K1J9D6" was restored in the disturbed area of the object identified as E1-18-0734.
ALNQFP	The obliterated surface on the metal bar stock (Exhibit 1) was mechanically and chemically processed. The restored serial number on the piece of metal (Exhibit 1) was determined to be K1J9D6.
AQJ6WU	The serial number was restored and was determined to be K1J9D6.
AQPMGD	The obliterated area on the piece of 303 stainless steel bar stock in item 1 was chemically etched and the serial number was determined to be K1J9D6.
ARVKQU	A serial number restoration was performed on this item. Based upon CTS, the expected serial number configuration is 6 characters. The serial number was fully restored and appeared to be K1J9D6.
AUNZ3G	Upon analysis, I am opinion the obliterated serial number on "Item 1" bar stock was restored and interpreted as "K1J9D6".

TABLE 2

WebCode	Conclusions
AX3X8J	Examination and chemical processing of the firearm item #1 restored the original obliterated serial number which was determined to be "K1J9D6". A search of the NCIC stolen gun files by serial number "K1J9D6" revealed no matching entries.
B3QUEL	The obliterated serial number of the stainless steel bar stock (item 1) was chemically restored and determined to be K1J9D6. No E-Trace was run on the restored serial number.
BBNMNZ	The serial number on item 1 was restored to K1J9D6.
BDBMXY	Serial Number Restoration Analysis: Methodology- Chemical Reagent Etching/Microscopy. Serial number restoration procedures revealed the serial number on Item 1, the apparent stainless steel bar stock, to be: K 1 J 9 D 6
BGPTDB	3. On 2018-02-06 during the performance of my official duties I received a sealed evidence bag with number PA4001477006 from Case Administration of the Ballistics Section, containing the following item: 3.1 One (1) sealed envelope, marked "2018 CTS Forensic Testing Program TEST NO. 18-5250: SERIAL NUMBER RESTORATION Sample Pack: SNR1", containing the following exhibits: 3.1.1 One (1) piece of stainless steel bar stock marked "ITEM 1 TEST NO 18-5250". 3.1.2 One (1) piece of aluminium bar stock marked "Aluminium standard". 4. The intention and scope of this forensic examination comprise the following: 4.1 Techniques associated with the recovering and restoration processes of obliterated alpha-numeric figures on metals. 5. After application of the electro-magnetic process, I determined the serial number of the stainless steel bar stock mentioned in paragraph 3.1.1 as K1J9D6.
BKAN8V	The serial number of Item 1 was mechanically and chemically processed and restored to read "K1J9D6". This conclusion was verified by Firearms Examiner(name).
BL687C	Examination and chemical processing of Item 1 restored the original obliterated serial number which was determined to be "K1J9D6".
BN8879	Using standard laboratory techniques, the obliterated serial number on Item 1 was restored to read K 1 J 9 D 6.
BQEG9D	after application of electro-magnetic process, i determine the serial number of the stainless steel as K1J9D6.
BQVQ7L	The item 1 (LIMS #1-1-1) bar stock with an obliterated area was examined and processed using standard serial number chemical restoration techniques. The serial number was restored to read: K1J9D6.
BRNLL3	The serial number was fully restored to read "K1J9D6".
BTNTCJ	The serial number has been restored to read: K 1 J 9 D 6
BV6HBM	Serial Number Restoration Analysis: Methodology- Chemical Reagent Etching/Microscopy/Physical. Serial number restoration procedures revealed the serial number on Item 1A, the metal bar stock, to be: K 1 J 9 0 6.
BXZFRZ	The suspected obliterated serial number on Item 1 was restored and interpreted as "K1J9D6"
C8GM4U	Item #1 (bar stock with suspected obliterated serial number) was examined on 2/13/2018 and found to contain an area of apparent obliteration with overlapping circular signatures. Serial Number Restoration began and was completed on 2/13/2018. Serial Number Restoration was successful. The serial number on Item #1 (bar stock) was recovered as: K1J9D6.
CA7BJB	Examination of Item 1 revealed an obliterated area on the stainless steel bar stock. Standard chemical restoration techniques revealed the following characters:"K1J9D6".
CA8N9H	The obliterated serial number has been restored by using sandpaper and acid.

TABLE 2

WebCode	Conclusions
CAQCTX	Examination of Exhibit #1A revealed an obliterated area on one side of the piece of metal. Standard restoration techniques revealed the following characters "K1J9D6".
CG86JM	The restoration of the obliterated serial number revealed the 6 characters : K1J9D6
CLHA4B	After the application of the electro-magnetic process and electro-acid etching process i determined the serial number of the stainless steel bar stock as K1J9D6.
CN7E7F	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 'K1J9D6'. Hence, i am of the opinion that the number of the steel bar was tempered and the original number was K1J9D6.
CUBURQ	The obliterated area was cleaned, polished, and etched with chemical reagents. A serial number of K1J9D6 was restored.
CWFJUZ	A chemical etching process was used to restore a serial number, which was identified as being K1J9D6.
D6AKNN	Magnetic particle inspection was used to restore the serial number.
DA7ZJQ	The serial number on Exhibit #1 was restored to read K1J9D6.
DAYNGM	Visual examination and chemical treatment of the serial number area on the bar stock, Item 1A, reveal the following number: K1J9D6 Item 1B inspected to verify and document contents. No analysis was performed on the item listed.
DBGYFL	The serial number on the piece of ferrous metal (Exhibit 1) was mechanically and chemically treated and restored to read K1J9D6.
DBUFRD	After application of the electro-magnetic etching process, I determined the serial number of the exhibit as K1J9D6.
DDY9JR	The stainless steel bar stock was received with an obliterated serial number. Serial number restoration was attempted and the results were positive. The final interpretation of the serial number is "K1J9D6".
DFN2JB	The submitted piece of 303 stainless steel bar stock was examined and prepared for an attempt to recover the suspected obliterated serial number. The recovered serial number was found to be K1J9D6.
DLXLPL	The serial number on the piece of metal (Exhibit 01) was mechanically and chemically treated and restored to read K1J9D6.
DNLBVK	The serial number on the piece of metal (Exhibit 01) was mechanically and chemically treated and restored to read K1J9D6.
DX9ALQ	The steel bar stock from Item 1 was examined and it was determined that an area had been obliterated. The steel bar stock was placed on a magnet and magnetic particles applied. The serial number was restored and determined to be: K1J9D6
DY6AHQ	The obliterated serial number area was mechanically polished and chemically processed. The serial number was successfully restored to read K1J9D6.
E3Z28R	The serial number of Item 1 was mechanically and chemically processed and restored to read "K1J9D6". This conclusion was verified by Firearms Examiner _____.
E4VJ89	Item 1 - A PIECE OF 303 STAINLESS STEEL BAR STOCK WITH SUSPECTED OBLITERATED SERIAL NUMBER. Serial number restoration via acid etching yielded the serial number K1J9D6. The serial number K1J9D6 should be checked through NCIC.
E6Q3DF	Chemical restoration procedures revealed the following serial number in the defaced area: K1J9D6.

TABLE 2

WebCode	Conclusions
E8A4C9	Stainless steel plate (item#1) was chemically processed. Its serial number was restored to read K1J9D6.
E8TZJ3	Examination and processing of the Q-1 steel bar restored the original obliterated serial number, which was determined to be K1J9D6.
EC8DQG	The Item 1 stainless steel bar stock has an area of obliteration. This area was polished followed with chemical etching. The serial number of Item 1, was restored using chemical etching to read: K1J9D6. The restored information is similar in design and size to the alphanumeric characters on the provided aluminum standard.
EP9RGM	Examination of the submitted stainless steel bar stock (Item 1) found the manufacturer's serial number to have been obliterated. Physical and chemical processing of the submitted stainless steel bar stock (Item 1) restored the obliterated, original serial number to read "K1J9D6".
ER28WF	The submitted specimen marked as Item 1 was examined and identified as a piece of 303 stainless steel bar stock with a suspected obliterated serial number. As a result of examination and chemical processing, it was concluded that the obliterated serial number was restored to read "K1J9D6."
ERJ2TJ	Examination and restoration of the obliterated area on Item 1 (stainless steel bar stock) revealed the following characters interpreted as "K1J9D6".
ERLJZV	Standard laboratory techniques for restoring effaced markings in metal have been employed on the center of the bar stock Exhibit 1. The serial number was restored and observed to be K1J906.
EW8JMV	The serial number was restored and reads K 1 J 9 D 6.
EXNXDJ	Obliterated number (milled) on non magnetic metal. Polished and restaured with Fry's reagent : K1J9D6
F4PENP	The serial number on the Item #1 metal block was restored to read K1J9D6.
F66VK4	The above number was abliterated through mechanically obliterated of metal surface from serial number field.
F93CVC	Based on the above examination and findings, I am of my opinion that the original serial number on a piece of 303 stainless steel bar stock "Item 1" is "K1J9D6".
F946V6	Using standard laboratory restoration techniques, the obliterated serial number on Item 1 was restored to read "K 1 J 9 D 6'.
FCKJBY	After application of the electro magnetic process, I determined the serial number of the 303 stainless steel bar stock as K1J9D6.
FGWF8L	(Item #1) One (1) piece of ferrous metal with abraded serial #. Measuring 2 3/4" x 1" x 1/4". Serial # "K1J9D6" was recovered through MPI and the chemical etching process.
FHUMCY	The obliterated area of the block (exhibit 1) was chemically processed and was restored to "K1J9D6".
FLQCR7	Item 1 was physically and microscopically examined. The serial number area of Item 1 was prepared and treated with chemical reagents. As a result of these actions, the serial number was restored to read "K1J9D6".
FRV6UN	Item 1 revealed a full serial number with sufficient characteristics to allow positive identification. The restored characters are : K1J9D6.
FWCDB2	Examination and processing of the Q-1 bar stock restored the original obliterated serial number, which was determined to be "K1J9D6".
FYRNWE	The number on the piece of metal bar was restored to read: K1J9D6
G8N6D2	The characters K1J9D6 were restored on the 1.1 metal plate.



TABLE 2

WebCode	Conclusions
GCWTMW	The alphanumeric sequence revealed in the piece of questioned aluminum identified as E1-18-0733 (Test No 18-5250 Item 1) corresponds to K1J9D6.
GDTYAH	The serial number on the piece of metal (Exhibit 1) was mechanically and chemically treated and restored to read K1J9D6.
GJKB8Z	Examination and processing of the Q-1 bar stock restored the original obliterated serial number, which was determined to be K1J9D6.
GLADDM	The obliterated area on the submitted metal bar, item 1, was examined. Standard restoration techniques were applied to the area. The serial number of the obliterated area on Item 1 was restored to K1J9D6.
GQWAVJ	The serial number on Item 1 was restored to read K1J9D6.
GR8CGH	The obliterated number on the non-ferrous metal piece was restored to read: K1J9D6.
GUGGYC	The serial number is milled off. The serial number (K1J9D6) was restored by acid etching. 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 area of the firearm.
GXCXLE	3. On 2018-02-12 during the performance of my official duties, I received a sealed evidence bag with number PA4001476997 from Case Administration of the Ballistics Section, containing the following exhibit: 3.1 One (1) piece of 303 stainless steel bar stock, with obliterated serial number, marked by me "49154/18 1". 3.2 One (1) piece of aluminium bar stock for reference purposes. 4. The intention and scope of this forensic investigation comprise the following: 4.1 Techniques associated with the recovering and restoration processes of obliterated alpha-numeric figures on metals. 5. After application of the electromagnetic process, I determined the serial number of the stainless steel bar mentioned in paragraph 3.1 as K1J9D6. 6. The conclusions arrived at were based on facts, established by means of an examination and process which require a knowledge and skill in Forensic Ballistics. 7. The exhibits mentioned in paragraphs 3.1 and 3.2 were disposed of as follows: 7.1 On 2018-02-14 the exhibits were sealed in an evidence bag with number PA4000105193F and handed over to the Quality Manager of the Ballistics Section. 8. During the performance of my official duties the exhibits mentioned were for the purpose of their examination kept in my custody, under lock and key, from 2018-02-12 until 2018-02-14.
H3NBVQ	Using standard laboratory restoration techniques, the obliterated serial number on Exhibit 001-a (Item #1: 303 stainless steel bar stock) was restored to read K1J9D6.
H3NF48	Examination of the surface of the stainless steel bar revealed evidence of an obliterated serial number. The surface was treated and the following characters were restored: K 1 J 9 D 6.
H6CR3D	I found filing marks on the metal plate Item 1. Upon electrochemical treatment on the filed surface, the number 'K1J9D6' was restored. Therefore, I am of the opinion that the obliterated serial number is K1J9D6.
H9RC2L	The examination and chemical processing of the bar, Item # 1, revealed a full serial number with sufficient characteristics to allow the examiner to make a positive identification. The characters restored are as followed: "K1J9D6".
HE4BJ8	The characters were removed approximately 0.2-0.3 mm thickness. The removed serial number was resulted by the examination: K1J9D6.
HEW8KL	After applying the Hydrochloric Acid deluted in water(5% HCL) the above mentioned character were restored.
HHKQVK	One (1) piece of stainless steel approximately 2 5/8" x 1 serial number defaced by abrasion, however recovered number "K1J9D6" using a magnetic particle method.
HJUQMK	The serial number on the stainless steel bar stock, Item 1, was determined to be: K 1 J 9 0 6.

TABLE 2

WebCode	Conclusions
HL46GF	An obliterated area was observed on Item 1. Standard serial number restoration techniques revealed the following characters: "K1J9D6".
HRL8DA	Many objects have serial numbers, whether is a firearm or motor vehicle. These serial numbers can be easily removed but serial numbers that are mechanically stamped into a metal surface can be restored using etching process. When a serial numbers are stamped into a metal surface, the metal beneath these stamps is compressed. When the number is removed, either by filing or grinding. The perpetrator is satisfied that his task was successful if number is no longer visible. But in reality, the compressed metal still retains those marks or number. The number can be recovered using etching process.
HWWL7G	Serial Number Restoration Analysis: Methodology- Chemical Reagent Etching/Microscopy/Physical. Serial number restoration procedures revealed the serial number on Item 1, the bar stock, to be: K 1 J 9 D 6
JF7232	An area on one side of Item 1 was obliterated. Standard chemical restoration techniques revealed the following characters: K1J9D6.
JFTRGL	Item 1 was examined. The obliterated serial number on Item 1 was processed using magnetic particle inspection and restored to read K1J9D6.
JJPk7A	A CHEMICAL RESTORATION TECHNIQUE WAS UTILISED TO RECOVER THE OBLITERATED NUMBER ON THE PIECE OF STEEL. AS A RESULT OF THIS PROCESS THE FOLLOWING NUMBER WAS IDENTIFIED K1J9D6.
JLW367	[No Conclusions Reported.]
JNKRPT	The number stampings had been completely obliterated by grinding on the test. Using restoration techniques including chemical etching, the number restored was K1J9D6.
JU89UG	The serial number on Item 1 was restored to K1J9D6.
JVP7GF	The serial number on the piece of metal (Exhibit 1) was mechanically and chemically treated and restored to read K1J9D6.
JWVTRY	The " Item 1 " obliterated serial number on a piece of bar stock, was chemically restored to read K1J9D6.
K26D8J	The serial number on Item 1 was restored to read: K1J9D6.
K73MNC	Serial number restoration techniques were applied to the submitted test number: 18-5250 Item 1. The serial number was determined to be K1J9D6.
K9MLVF	The serial number on Item 1 was restored to read K 1 J 9 D 6. The aluminum standard was not further examined.
KBVU6Z	Using standard laboratory restoration techniques, the obliterated serial number on Item 1 was restored to read "K1J9D6".
KDZMUR	The restored sequence from the piece of stainless Steel bar (Item 1) were "K1J906".
KH9W2Z	3. On 2018-02-12 during the performance of my official duties I received a sealed evidence bag with number PA4001476995 from Case Administration of the Ballistics Section containing the following: 3.1 One (1) metal plate marked by me "49218/18 1". 3.2 One (1) metal plate not marked by me, to be used as a reference standard. 4. The intention and scope of this forensic examination comprises of the following: 4.1 Techniques associated with the recovering and restoration processes of obliterated alpha-numeric figures on metals. 5. After application of the electro-magnetic process, I determined the serial number of the metal plate mentioned in paragraph 3.1 as K1J9D6.
KLQ69Z	The obliterated area on the piece of stainless steel bar stock in item 1 was chemically etched and the serial number was determined to be K1J9D6.

TABLE 2

WebCode	Conclusions
KU6RKP	The obliterated serial number, located in the center of the item, was restored to read "K1J9D6."
L3VRHE	The restoration of the obliterated serial number on Item 1 (SNR pack SNR1) by acid etching techniques revealed the following number : K1J9D6.
LDCHXC	The stainless steel bar stock was submitted with an illegible serial number. An attempt was made to restore the serial number by magnetic particle inspection. The complete serial number was restored and noted as : K1J906.
LERZYW	Examination and chemical restoration of the obliterated area on Item 1 revealed the following characters interpreted as: "K1J9D6".
LGH26K	The serial number on the 303 stainless steel bar (item 01-01) is K1J9D6.
LH8FKG	The obliterated serial number on the stainless steel bar stock in Item #1 was completely restored and found to be K 1 J 9 D 6.
LJ84A9	One (1) block of silver ferrous metal measuring approximately 2 3/4" long x 1" wide x 1/4" thick displaying a 1" x 1" area milled away. Serial number K1J9D6 recovered with chemical etching. Item marked 18-5250 A for Identification.
LKUYJU	After using the electro magnetic etching process, I discovered the serial number of the steel bar stock possibly as: K1J9D6.
LKWGTQ	A serial number restoration was performed on Item 1 bar stock. The serial number was restored to read " K1J9D6".
LL6T98	Based on the above examination and finding, I am of the opinion that the original serial number on the piece of stainless steel bar stock 'Item 1' is K1J?D6, where '?' is an indecipherable alphabet.
LMJFNZ	Item 1 was physically and microscopically examined. The serial number area of Item 1 was prepared and treated with chemical reagents. As a result of these actions, the following characters were recovered K 1 J 9 D 6.
LQ3DCQ	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
LZK4NG	After application the right procedure (cleaning, polishing, chemical reagent and preserving) for 15 minutes, the erased serial number was total and clearly restored. The reagent used is the Fry's solution, after cleaning the zone using acetone and polish with sandpaper. The serial number is represented by alphabetical and numerical combination: K1J9D6
M464TN	The submitted sample is a piece of Stainless Steel with a milled down area on one side. After preparing the sample, the Magnetic Particle Method was used to examine it. The obliterated serial number was restored with this method and was clearly visible.
M4L7DH	The serial number was defaced by an abrasive method. Restore using the Magnetic Particle method.
M4PWCD	The obliterated serial number was restored and concluded to most likely be K1J906.
MABWJD	Serial number restoration was performed on the item 1.1 piece of metal. The serial number K1J9D6 was restored.
MH8UBM	Upon electrochemical treatment on the filed surface, the original number was restored and read as K1J9D6
MJ2HRX	Serial number restoration revealed the number K 1 J 9 D/0 6.
MRRGFR	The serial number had been erased. I was able to restore the serial number to read K1J9D6
MUWQAZ	The Bar stock was chemically and magnetically processed. Its serial number was restored to read: K1J9D6

TABLE 2

WebCode	Conclusions
N36XNN	Examination of the stainless steel bar (SNR1) indicated that the surface of the metal bar had been ground/milled. The ground metal surface was subjected to a restoration technique and I recovered the characters 'K1J9D6'. I am of the opinion that the characters 'K1J9D6' had been originally stamped onto the surface of the stainless steel bar SNR1.
N42ZE4	The original number was grinded and have been restored read as K1J??6 (where "?" is the number or alphabet that cannot be identified).
N76UDA	The serial number on Item 1 was restored to read "K1J9D6".
NCWEEE	Examination of the submitted bar stock revealed that the serial number had been obliterated. Physical and chemical processing of the bar stock restored the obliterated, original serial number to read "K1J9D6".
NHZU27	3. On 2018-02-08 during the performance of my official duties I received a sealed evidence bag with number PA4001476999 from Case Administration of the Ballistics Section, containing the following exhibits: 3.1 One (1) piece of stainless steel bar stock with serial number obliterated and marked by me "49132/18". 3.2 One (1) piece of aluminum bar stock labelled as "Aluminum Standard". 4. The intention and scope of this forensic examination comprise the following: 4.1 Techniques associated with the recovering and restoration processes of obliterated alpha-numeric figures on metals. 5. After application of the electro-acid etching process and/or electro magnetic process, I determined the serial number of the exhibit mentioned in paragraph 3.1 possibly as K1J9D6.
NPK3A4	On the examination, I found that there were filing mark on the stainless bar stock and no numbers were observed. On electrochemical treatment, a set of number read as "K1J9D6" was restored. Hence, I am of the opinion that the numbers of the stainless steel bar stock were tempered and the original numbers were "K1J9D6".
NPYKDA	Standard laboratory procedures used to restore characters stamped in metal have been performed on the machined area of the steel bar stock. The characters restored are: "K1J9D6"
NTJJKC	The serial number was restored to read K1J9D6.
P37UFP	Item 1 is a metal bar, serial number obliterated. The serial number was restored to read: K1J9D6.
P3MVG7	Chemical restoration of number on stainless steel sample Star time : 15h00 / Finish time : 15h30 Characters stamped : K1J9D6
PCQJ9D	Examination of the submitted aluminum bar stock found the serial number to have been obliterated. Physical processing of the submitted aluminum bar stock restored the obliterated, original serial number to read K1J906.
PDJFVL	The serial number was restored and read K 1 J 9 D 6.
PEVRGM	The chemically enhanced serial number on item 1 is K1J9D6
PKZJJ7	3. On 2018-02-20 during the performance of my official duties I received a sealed evidence bag with number PA4001476996 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) sealed envelope marked "Test No. 18-5250: SERIAL NUMBER RESTORATION", containing the following: 3.1.1 One (1) envelope marked "Test No. 18-5250 Item 1 ZINC BAR STOCK", containing the following exhibit: 3.1.1.1 One (1) piece of metal marked by me "49209/18A. 3.1.2 One (1) envelope marked "Aluminum Standard Test No. 18-5250", containing the following exhibit: 3.1.2.1 One (1) piece of metal with numbers "0 to 9" and letters "A to F" and "H", "J", "K" and "N", not marked by me. 4. The intention and scope of this forensic examination comprise of the following: 4.1 Techniques associated with the recovering and restoration of obliterated alpha-numeric figures on metals. 5. After application of the electro-magnetic etching process, I determined the number on the piece of metal mentioned in paragraph 3.1.1.1 as K1J9D6.

TABLE 2

WebCode	Conclusions
PR9U67	Serial number restoration techniques were applied to Item 1. The serial number was determined to be K1J906.
PZFB97	The serial number on the steel bar stock, item 1, was observed to have been obliterated. Magnetic particle inspection was used to restore the obliterated serial number to "K 1 J 9 D 6."
Q3GUCJ	Examination of Item #1 revealed an obliterated area in the middle portion of the bar stock. Standard serial number restoration techniques revealed the following characters "K1J9D6".
QDJCMM	The obliterated serial number on the Item 1 stainless steel bar was restored to read K1J9D6.
QGY8LE	A series of previously stamped characters were restored, These read: K1J9D6. The size and font were similar to the ones used on the aluminium bar stack labelled "standard"
QHQUU2	After the application of electro acid method on the aluminum plate it was very easy to recover the obliterated number. This is a traditional process used on metal surface.
QM4PKX	The restoration techniques applied allowed identification of the previously erased serial number "K 1 J 9 D 6 "
QNZ2K7	The serial number of Item 1 was restored to read K1J9D6.
QPYYU9	Serial Number Restoration Analysis: Methodology - Chemical Reagent Etching/Microscopy. Serial number restoration procedures revealed the serial number on Item 1, the 303 stainless steel bar stock, to be: K 1 J 9 D 6
QRXZU6	The serial number of the CTS unknown was processed using mechanical polishing and chemical etching. The serial number was restored and determined to be: K1J9D6.
QTKWQB	Serial number restoration was successful through the use of magnetic particle inspection and chemical etching. The recovered number reads "K1J9D6".
QWM9UV	AFTER THE ELECTRO-MAGNETIC PROCESS AND ELECTRO-ACID ETCHING PROCESS I DETERMINED THE SERIAL NUMBER OF THE STEEL BAR AS K1J9D6
R3GEED	The obliterated serial number on Item 1 was polished and chemically restored to read K1J9D6.
R47RVA	THE SUBMITTED BAR STOCK WITH THE POSSIBLE OBLITERATED SERIAL NUMBER WAS MARKED Q1 FOR IDENTIFICATION. Q1 WAS POLISHED AND CHEMICALLY PROCESSED. THE SERIAL NUMBER RESTORATION REVEALED THE FOLLOWING NUMBERS AND LETTERS; K1J9D6.
R4A8BW	The serial number was partially restored using chemical restoration techniques. The serial number was determined to be ?1J9D6, where the "?" represents a character that could not be determined with confidence.
R64DPB	Magnetic and physical processing restored the serial number to read: K1J906.
R7CCLV	Item 1 was physically and magnetically processed. Its serial number was restored to read: [K1J9D6].
RBAA9B	As received, it was observed that Item 1 ("stainless steel" bar stock) had an obliterated area centrally on the side I designated as "Side A." This area appeared to have been obliterated by milling and/or some form of abrasion. Within the laboratory, the obliterated area on Item 1 was polished with sandpaper and chemical etchants were applied. The restored serial number was K1J9D6. Photographs documenting the progress of the restoration were taken.
RNFK7P	Item 1 was examined and exhibited an area of obliteration. Polishing and chemically etching the obliterated area revealed the following serial number: K1J9D6.
RQL36K	The serial number on item 1 was restored to K1J906.
RQZR7C	The obliterated serial number on item A1-1 was restored and found to consist of six alphanumeric characters as follows; K-1-J-9-D-6.

TABLE 2

WebCode	Conclusions
RTP6LA	The item 1 obliterated serial number, located on the front middle of the stainless steel bar stock was polished using the Dremel and chemically processed and restored to read F4N91B.
T3BJ9C	The serial number on the piece of stainless steel bar stock (Item 1) was restored as K1J9D6.
T3QPN2	The serial number on Item #1 was restored to read "K1J9D6".
T4ZWPA	THE SURFACE OF Q1 (ITEM 1) STAINLESS STEEL BARSTOCK WAS POLISHED TO PREPARE IT FOR THE APPLICATION OF CHEMICAL ETCHING SOLUTIONS. THE NUMBER RESTORED BY THE SERIAL NUMBER RESTORATION PROCESS READS: K1J9D6
T7MFNL	After application of the electro-acid etching, I determined the serial number of the exhibit mentioned in 3.1 as K1J9D6.
T9BUBB	Examinations showed the serial number of Item 1.1 to be obliterated. The serial number of Item 1.1 was recovered using mechanical polishing and chemical etching techniques and was found to be: K1J9D6.
T9FCBU	AFTER APPLICATION OF THE ELECTRO MAGNETIC PROCESS. I DETERMINED THE SERIAL NUMBER OF THE STAINLESS STEEL BAR STOCK AS KIJ306
TDPKMW	The obliterated serial number on item 1 was restored using Fry's reagent and found to be K, 1, J, 9, D, 6.
TME9GZ	Examination and chemical processing of the bar restored the obliterated serial number to read "K1J9D6".
TNBZPA	Physical and chemical processing of the submitted bar stock restored the obliterated, original serial number to read "K1J9D6".
TT92VN	Examination and processing of the Q-1 bar stock restored the original obliterated serial number, which was determined to be K1J9D6.
TWNFHA	THE STAINLESS STEEL BAR STOCK (ITEM 1) WAS MARKED Q1, DCL, U3768D TO THE LEFT OF THE OBLITERATED SERIAL NUMBER AREA. THE AREA WITH THE SUSPECTED OBLITERATED SERIAL NUMBER WAS POLISHED WITH A DREMEL TOOL AND THEN THE CHEMICAL ETCHING SOLUTIONS WERE APPLIED. THE OBLITERATED SERIAL NUMBER WAS RESTORED TO READ AS FOLLOWS: K1J9D6.
U7LZX8	The defaced serial number on the stainless steel bar stock (item 1) was restored to read "K1J9D6".
UE48XK	The restoration of the area presenting alteration was done and it was possible to achieve the complete restoration where the alphanumeric sequence K1J9D6 was observed.
UEFGN7	1) The obliterated area on Exhibit 1 (Metal Bar) was visually examined, magnetically processed, and chemically processed. The characters were restored and appeared as follows: K 1 J 9 D 6.
UEKJFP	Using standard laboratory techniques the obliterated serial number on Item 1 was restored to read "K1J9D6".
UG83F2	The serial number from Item 1 was restored to read K1J9D6.
UGNU9T	Attempts were made to recover the suspected obliterated serial number on the piece of bar stock (Item 1). The recovered serial number was determined to be: K1J9D6.
UH2QZH	A piece of metal was received, which presents wear of the surface, the magnetic method of restoration was applied and the numeration K1J9D6 was obtained, which was in agreement with the comparative material.
UKMAGG	I conducted a serial number restoration on a piece of steel that has been ground. With the use of sandpaper and a chemical treatment I was able to restore the characters 'K1J9D6'. The characters identified are consistent with the characters stamped into the aluminum sample plate provided.

TABLE 2

WebCode	Conclusions
URNPN3	Restoration of the obliterated stamped marking was performed on the questioned surface of Item 1, and the restored serial number was found to be "K1J9D6".
UT4434	The serial number on the piece of metal (Exhibit 1) was mechanically and chemically treated and restored to read K1J9D6.
UUHDAJ	Surface was obliterated. By magnetic restoration we found K1J9D6.
V7KGT4	The work on the milled serial number of the steel bar identified as 'Item 1' has given the following result : K1J9D6
V8YMDZ	As a result of an attempted number restoration the following characters were observed: K1J8D6.
VBZVFP	Serial number restoration revealed the number K1J906.
VR2BFQ	An obliterated area was observed on Item #1. Standard restoration techniques were applied which revealed the following characters: K1J9D6.
VWJVPQ	Item 1 was physically and microscopically examined. The serial number area of Item 1 was prepared and treated with chemical reagents. As a result of these actions, the serial number was successfully restored to read "K 1 J 9 D 6".
W92AY4	The serial number was restored to read K1J9D6.
WEVZQ9	The serial number on the stainless steel bar stock, item 1, was partially restored to read K1J*D6. The "*" represents a partially restored character that could be a "9", "0", or "D".
WGMY68	Serial number restored using chemical etching process. Reads "K1J9D6*". CTS # scribed on back of bar stock by examiner for identification purposes.
WJ63UP	Examination, magnetic and chemical processing restored the obliterated serial number, which was determined to be "K1J9D6".
WKX3NU	Item 1 was a piece of weakly magnetic metal with an obliterated area. I used grinding, sanding, chemical etchants, and magnetic particle inspection to restore the obliterated characters to K1J9D6.
WRH8MA	The recovered obliterated serial number on item 1 is K1J9D6.
WU8K48	The obliterated serial number was chemically restored and found to be "K1J9D6."
WWW2BU	After application of the electro-magnetic process, I determined the serial number of the stainless steel bar stock as K1J9D6.
X3H2GY	Exhibit 1 is a piece of 303 stainless steel bar stock with an obliterated serial number. The obliterated serial number was caused by a milling or similar process. No toolmarks of value were observed. The obliterated area was polished and chemically processed. The serial number "K 1 J 9 D 6" was observed.
XAFTLL	Examination and chemical processing of Item #1 piece of bar stock restored the following characters: "K1J9D6".
XDBUEN	After application of the electro-magnetic process, I determined the serial number on the piece of 303 stainless steel bar stock as K1J9D6.
XEL3Q4	Submission 001 was analyzed and it was determined that the serial number was obliterated, most likely by means of filing. Chemical etchants were applied to the area of obliteration and the serial number restored was "K1J9D6". No further analysis was conducted at this time. This report contains the opinions and interpretations of the individual whose signature appears on the report.
XND8JU	Item #1 was received with a suspected obliterated serial number. Attempts to restore the serial number with polishing and chemical processing successfully restored the serial number to read "K1J906".

TABLE 2

WebCode	Conclusions
XNWRQM	Serial number restoration revealed the number K1J9D6.
XRVLDD	Serial Number Restoration Analysis: Methodology- Chemical Reagent Etching/Microscopy/Physical. Serial number restoration procedures revealed the serial number on Item 1A, the metal bar, to be: K 1 J 9 D 6
XU3DMW	Using laboratory chemical restoration methods, the serial number was restored to read "K1J9D6".
XZR32E	The piece of metal analyzed shows alteration by tool wear of the metallic surface. After the analysis, the sequence was revealed, concordant with the characteristics Pvaluated in the comparative material.
Y4AFJG	Restoration procedures on exhibit SNR1 revealed the serial number to be: K 1 J 9 D 6
Y4LJNT	I found the serial number to have been obliterated by filling. On electrochemical treatment, I developed the number 'K1J9D6'. I am of the opinion that the original serial number was K1J9D6.
Y7CDUA	The serial number on the bar stock was restored to read K1J9D6.
Y8ANPD	The serial number on item 1 was restored to K1J906.
Y9X8NP	The stainless steel bar stock (Item #1) was physically/chemically/magnetically processed. It's serial number was restored to read: K1J9D6.
YGQHWY	The obliterated serial number on Item #1 was partially restored to read K, 1, J, ?, D, 6. The "?" was used to represent an un-restored character.
YKN3FP	After application of the electro-acid etching process, I determined the serial number of the stainless steel bar stock possibly as K1J9D6.
YPLLHN	After application of the electro-acid etching process and electro-magnetic process, I determined the serial number of the exhibit mentioned in 3.1 as K1J9D6.
Z39MW4	The serial number was successfully restored to read K1J9D6.
Z7NNVL	3. On 2018-02-06 during the performance of my official duties I received a sealed evidence bag with number PA4001476994 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) piece of stainless steel bar stock with serial number erased marked by me "49245/18". 3.2 One (1) piece of aluminium bar stock marked "Aluminium Standard". 4. The intention and scope of this forensic examination comprise of the following: 4.1 Techniques associated with the recovering and restoration processes of obliterated alpha-numeric figures on metals. 5. After application of the electro-magnetic process, I found K1J9D6 on the piece of stainless steel bar stock mentioned in paragraph 3.1.
ZK4CRW	Using the acid etch method, the characters within the defaced area of the Item 1 steel bar stock were restored to read "K1J9D6".
ZTHY22	Visual examination and chemical treatment of the serial number area on the stainless steel barstock, Item 1A, reveal the following number: K 1 J 9 D 6 Item 1B was submitted as a reference standard for comparison to Item 1A. No analysis was performed on Item 1B.
ZY4P3R	After application of the electro-acid etching process and electro-magnetic process, I determined the serial number of Item 1 as K1J9D6.
ZYM7B	The serial number on item 1 was restored to K 1 J 9 0 6 .



# Sample Preparation

(listed in order of use)

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
2AG8AP	The area to be etched was polished until it was mirror shine and smooth. Coupled a light electric current to the exhibit positive pole was attached to the exhibit. Negative pole attached to a stainless steel rod with a cotton wool twisted around the tip.  Cotton wool was dipped into a solution (Green Mamba) and rub the area until the number appears	The dremel	
2BVK6D	Polishing	Dremel	
2F8GJN	Grinding	Dremel	
	Sanding	Sand paper	320 Extra Fine
2J9F3T	Visual		
	Visual	Microscope	
	Sanding	Sand paper	150 fine grit
	Sanding	Sand paper	220 very fine grit
2KYLED	Sanding	Dremel	unknown
	Polishing	Dremel	
2LEY7V	Visual	Stereoscope	
2Q77LH	Visual		
2UW8VD	Polishing	Dremel	
2Y6V3M	Sanding	Sand paper	P400
3AE79X	Visual	Microscope	
3FK2RX	Sanding	Dremel	unknown
3HDDTH	Polishing	Rotary Tool	
3HE6P6	Sanding	Sand paper	150, 220
	Polishing	Sand paper	400, 600
3HYL8T	Polishing	Dremel	

TABLE 3

<b>Sample Preparation</b>			
<b>WebCode</b>	<b>Method</b>	<b>Tool Used</b>	<b>Grit Size</b>
3J3LWR	Visual	Microscope	
	Sanding	Sand paper	very fine
3KGKUW	Polishing	Dremel	
3MHNLJ	Polishing	Dremel	
3NM9XR	Sanding	Sand paper	240 grit
3VX83X	Polishing	Rotary Tool	
3YKEMK	Polishing	Dremel	
3YXZ2R	Visual	Stereoscope	
43R9U2	Cleaning	Acetone	
44P66Q	Visual		
	Grinding	Dremel	240
	Sanding	Sand paper	medium
	Polishing	Sand paper	fine
4FZ3EQ	Polishing	Steel wool	
4JJZ3G	Polishing	Acetone	
4NBDGP	Cleaning	Acetone	
4VWUXG	Visual		
4W89GA	Visual		
4ZBRTA	Sanding	Sand paper	150C
	Sanding	Sand paper	400
67VAMB	Visual	eyes/stereoscope	
	Polishing	Dremel	
	Polishing	Dremel	
	Sanding	Sand paper	600
68NJQV	Polishing	Dremel	
69HUN9	Sanding	Sand paper	220 and 1000

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
6DTME9	Visual	Photographs - Camera	
	Sanding	Sandpaper/H2O	200
	Sanding	Sandpaper/H2O	400
	Sanding	Sandpaper/H2O	600
	Sanding	Sandpaper/H2O	800
	Sanding	Sandpaper/H2O	1200
6HL4Y6	Visual	Stereoscope	
	Polishing	Dremel	
6KAXR9	Sanding	Emery paper	320, 600 & 1200
	Polishing	Rotary Tool	Buffer with chromium oxide as polishing abrasive
6LN3AX	Polishing	Dremel tool	N/A
6RRQHY	Cleaning	brake cleaner - M1V1	
	Visual	Cast - M2V1	
	Visual	Posti-test - M7V1	
	Sanding	Emery paper	1200 then 1500
6VB69K	Sanding	Sand paper	220
	Sanding	Sand paper	1000
6W6PJX	Polishing	Dremel	
6Y8PEP	Visual	Magnifying glass	
	Sanding	Sandpaper	150 grit
6ZMTAG	Polishing	Dremel	
72Y79X	Visual	Stereoscope	
778KNM	Sanding	Dremel	150
	Polishing	Dremel	
77MQCD	Sanding	Sand paper	320
79VZ7V	Polishing	Dremel-type	
7B4XV7	Polishing	Rotary Tool	
	Cleaning	Acetone	
7CTBAH	Sanding	Dremel	120

TABLE 3

Sample Preparation				
WebCode	Method	Tool Used	Grit Size	
7KTLQ9	Sanding	Sand paper	1000	
	Sanding	Sand paper	220	
	Sanding	Sand paper	1000	
7MUUVJ	Sanding	Sand paper	80	
	Sanding	Sand paper	220	
	Sanding	Sand paper	A400 (37 C)	
	Sanding	Sand paper	1000	
7QBA6B	Polishing	Buffing Wheel		
7R8JBL	Area to be etched was polished to mirror shine and smooth	1. Dremel tool		
	Taking care not to remove more of the metal than necessary	2.		
	Area was cleaned and oil removed with acetone or ethanol			
7VQNQW	Polishing	Dremel		
7WWM3Y	Polishing	Emery paper	800 then 1200	
7XXW4M	Visual inspection	Stereoscope		
	Polishing	dremel tool		
7ZGY3F	Sand and polish surface	by hand	All grit sizes	
828XUT	Visual	no tools, just eyes	n/a	
88ELAF	Visual	Stereoscope		
	Polishing	Dremel	Extra-Fine	
88G37J	Visual			
89TE9U	None			
	Grinding	Dremel		
8K4HBD	Polishing	Dremel		
8KLUG4	None			
8KMLCQ	Visual	Stereoscope		
	Polishing	Dremel		

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
8QR9VN	Visual	Stereoscope	
	Sanding	Sand paper	P320J Fine (After Magnaflux)
	Polishing	Dremel	(After Magnaflux)
8Y943A	Polishing	Dremel	
93VJFL	Cleaning	Acetone	
94UJ6L	Polishing	Buffer	
98TUZL	Polishing	Buffer	
98WJZC	Polishing	Dremel	Fine
9DJ7X3	Sand paper		80/120/180
	Polishing compound + wheel	Dremel	
9E9KCE	Sanding	Sand paper	120
9F63BV	Visual	Stereoscope	
	Sanding	Sand paper	320
	Polishing	Dremel	
9N2QDT	Sanding	Dremel	120 grit sanding band
	Polishing	Sand paper	600 mesh Aluminum Oxide
	Polishing	powder	microgrit polish
9Q92FN	Polishing	Dremel	
9UNT3B	Polishing	Dremel	
	Sanding	Sand paper	400p
9UPHGF	Sanding	Dremel	120
	Polishing	Sand paper	600
9WCC2M	Polishing and Fry's Reagent	Dremel	1200
9WDXZN	Polishing	Dremel	
A87L3B	Polishing	Rotary Tool	
	Visual	Side white light	
A9L6BE	Polishing	Dremel	
ABQTQ4	None		

TABLE 3

<b>Sample Preparation</b>			
<b>WebCode</b>	<b>Method</b>	<b>Tool Used</b>	<b>Grit Size</b>
ADDCR2	Visual		
ADTMHU	Visual	Stereoscope	
ADX6HD	Visual	Eyes	
	Sanding	Dremel	600 grit
	Cleaning	Alcohol	
	Polishing	Dremel	
	Cleaning	Alcohol	
AFLN94	Sanding	Sand paper	1000
ALNQFP	Polishing	Rotary Tool	POLISHING WHEEL
AQJ6WU	Polishing	Dremel	Cratex Ex-Fine
AQPMGD	Visual		
	Polishing	Dremel	polishing wheel
ARVKQU	Polishing	Dremel	n/a
AUNZ3G	None		
AX3X8J	Sanding	Dremel	150 Grit
	Sanding	Sand paper	220 Grit
	Sanding	Sand paper	1500 Grit
	Polishing	Dremel	
	Visual	Magnifying Glass	
B3QUEL	Visual	Stereoscope	
	Polishing	Dremel	Polishing Wheel #425
BBNMNZ	None		
BDBMXY	None		
BGPTDB	Visual		
BKAN8V	Polishing	Dremel	
BL687C	Sanding	Sand paper	400
BN8879	None		
BQEG9D	Sanding	Dremel	120

TABLE 3

<b>Sample Preparation</b>			
<b>WebCode</b>	<b>Method</b>	<b>Tool Used</b>	<b>Grit Size</b>
BQVQ7L	Polishing	Dremel	
BRNLL3	Sanding	Sand paper	80
BTNTCJ	Sanding	Sand paper	200
BV6HBM	Sanding	Sand paper	220
	Polishing	Dremel	
BXZFRZ	Polishing	Rotary Tool	
C8GM4U	Cleaning	Acetone	
CA7BJB	Cleaning	Acetone	N/A
	Sanding	Dremel	#500 Medium Soft
CA8N9H	Sanding	Sand paper	180
CAQCTX	Polishing	Rotary Tool	
CG86JM	Visual	naked eye	
	Polishing	Sand paper	60 & 80
	Polishing	Sand paper	600
	Cleaning	Ethanol	
	Visual	naked eye	
CLHA4B	Polishing	Dremel	600
CN7E7F	Visual	Microscope	
	Cleaning	Sand paper	
CUBURQ	Sanding	Sand paper	220, 400, and 600
CWFJUZ	Sanding	1200 grit sand paper	1200
	Polishing	steel wool + Brasso	
	Cleaned	Acetone	
D6AKNN	None		
DA7ZJQ	Visual	eyes	
	Visual	Stereoscope	
	Polishing	Dremel	
DAYNGM	Visual	Stereoscope	

TABLE 3

<b>Sample Preparation</b>			
<b>WebCode</b>	<b>Method</b>	<b>Tool Used</b>	<b>Grit Size</b>
DBGYFL	Polishing	Dremel	#74 Cratex Wheel (Fine)
DBUFRD	Sanding	Sander	medium
DDY9JR	Visual	OPTIVISOR	
	Visual	Stereoscope	
	Visual	VIEWING UNDER IR AND UV LIGHT	
	Polishing	Dremel	FINE/EXTRA FINE
DFN2JB	Initial polish	Dremel	Disc #43
	Final polish	Emery paper	Fine
	Visual inspection (no visible number)		
DLXLPL	Polishing	Dremel	
DNLBVK	Polishing	Dremel	
DX9ALQ	Visual		
DY6AHQ	Dremel Polishing	Dremel	
E3Z28R	Sanding	Sand paper	150
E4VJ89	Sanding	Dremel	
	Sanding	Sand paper	400
E6Q3DF	Polishing	Hand	medium, fine and x-fine
	Cleaning	water wet stone	
E8A4C9	Polishing	Sand paper	course
E8TZJ3	Cleaning	Dry kimwipe	
	Polishing	Dremel	
EC8DQG	Visual	Stereoscope	N/A
	Polishing	Dremel	Extra-fine
	Polishing	Dremel	Fine
	Polishing	Dremel	Medium
EP9RGM	Polishing	Dremel	N/A
ER28WF	None		



TABLE 3

Sample Preparation			
<u>WebCode</u>	<u>Method</u>	<u>Tool Used</u>	<u>Grit Size</u>
ERJ2TJ	Visual	Stereoscope	
	Polishing	Dremel	240 grit polish wheel
ERLJZV	Visual		
	Visual	Microscope	
	Sanding	Sand paper	220
	Sanding	Sand paper	600
EW8JMV	None		
EXNXDJ	Polishing	Rotary Tool	Norton® Bear-Tex® 1000 Series
F4PENP	Visual	-	
	Visual	Stereoscope	
	Visual	camera	
	Sanding	Sand paper	220
	Sanding	Sand paper	400
	Polishing	Dremel	
F66VK4	None		
F93CVC	None		
F946V6	Cleaning	Ethanol	
FCKJBY	None		
FGWF8L	Polish	Dremel	
FHUMCY	Polishing	Dremel	
FLQCR7	Visual	Stereoscope	
	Sanding	Sand paper	600 Grit
	Polishing	Steel wool	
	Grinding	Rotary Tool	
FRV6UN	Polishing	Dremel	
FWCDB2	Visual	Stereoscope	
	Polishing	Dremel	
FYRNWE	None		
G8N6D2	None		

TABLE 3

<b>Sample Preparation</b>			
<b>WebCode</b>	<b>Method</b>	<b>Tool Used</b>	<b>Grit Size</b>
GCWTMW	Sanding	Sand paper	220
GDTYAH	Polishing	Dremel	
GJKB8Z	Visual	Ambient Light	
	Polishing	Dremel	Polishing Wheel 425
	Visual	Ambient Light	
GLADDM	Visual	Stereoscope	
	Polishing	Sand paper	
GQWAVJ	Visual	Stereoscope	
	Sanding	Sand paper	P80, P220, 400
	Polishing	Steel wool	
GR8CGH	Polishing	Dremel	
GUGGYC	Polishing	mill	
GXCXLE	Cleaning	Acetone	
	Sanding	Dremel	120 GRIT, 32MM DIAMETER
H3NBVQ	None		
H3NF48	(1) Cleaning of surface with methanol	cotton wool	
	(2) Sanding of surface	Sand paper	P400
H6CR3D	Cleaning	Acetone	
H9RC2L	Sanding	Sand paper	fine / 1000
HE4BJ8	The surface of the sample was cleaned	by acetone	240/400grit
HEW8KL	Polishing	Sand paper	P40, P80 and P120
HHKQVK	Polishing	Dremel	N/A
HJUQMK	Polishing	Dremel	
HL46GF	Visual		

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
HRL8DA	Cleaning and polishing the whole area where marks had been effaced must be thoroughly cleaned. To ensure success the most important work by far is the polishing of the surface which must be etched	Fine file or emory paper; small drill	sic paper size 120 grit 100 pieces 32 mm dia; polishing cloth 50 pcs
HWL7G	Visual		
	Sanding	Sand paper	180 grit (very light)
JF7232	Polishing	Dremel	Fine
JFTRGL	Visual		
	Cleaning	Magnaflux Solvent and Cotton Swab	
JPK7A	Sanding	Sand paper	600 ULTRAFINE
JLW367	Visual	Stereoscope	
JNKRPT	Grinding	Dremel	
	Sanding	Emery paper	350
	Polishing	Emery paper	1200
JU89UG	Polishing	Dremel	
JVP7GF	Polishing	Dremel	
JWVTRY	Polishing	Dremel	
K26D8J	Visual	Stereoscope	
	Polishing	Dremel	
K73MNC	Polishing	Dremel	
K9MLVF	Visual		
	Visual	Stereoscope	
	Visual	photograph	
	Sanding	Sand paper	P80
	Polishing	Steel wool	
KBVU6Z	Sanding	Sand paper	150, 220, 400
KDZMUR	Sanding	Sand paper	400 / 1000
KH9W2Z	Cleaning	Acetone	

TABLE 3

Sample Preparation			
WebCode	Method	Tool Used	Grit Size
KLQ69Z	Polishing	Dremel	425
KU6RKP	Polishing	Dremel	
L3VRHE	Sanding	Rotary Tool	#500 then #240
LDCHXC	Sanding	Sand paper	240
	Sanding	Sand paper	400
LERZYW	Polishing	Dremel	
LGH26K	Polishing	Dremel	
LH8FKG	None		
LJ84A9	Polished	Rotary Tool	
LKUYJU	(1) Microscopic observation (2) Polishing	Microscope use of acetone & fine sand paper	
LKWGTQ	Polishing	Dremel	
LL6T98	None		
LMJFNZ	Cleaning	Steel wool	
	Polishing	Dremel	
LQ3DCQ	Sanding	Sand paper	400 and 600
LZK4NG	Cleaning	Acetone	
	Polishing	Sand paper	100 and 1200
	Cleaning	Cellulose paper	
M464TN	The sample was cleaned, any remains of grease were removed and the sample was then lacquered white to enhance contrast		
M4L7DH	None	None	None
M4PWCD	Polishing	Dremel	
	Sanding	Sand paper	1500
MABWJD	Polishing	Dremel tool	

TABLE 3

<b>Sample Preparation</b>			
<b>WebCode</b>	<b>Method</b>	<b>Tool Used</b>	<b>Grit Size</b>
MH8UBM	Cleaning	Acetone	-
	Sanding	Sand paper	Fine
MJ2HRX	Visual	Microscope	
MRRGFR	Visual	Stereoscope	
	Polishing	Rotary Tool	
	Visual	Stereoscope	
MUWQAZ	None		
N36XNN	Sanding	Sand paper	800
	Sanding	Sand paper	1200
N42ZE4	Cleaning	Acetone	
N76UDA	Polishing	Dremel	
NCWEEE	Polishing	Rotary Tool	
NHZU27	Cleaning	Acetone	
NPK3A4	Visual		
NPYKDA	Visual	Stereoscope	
	Polishing	Dremel	
NTJJKC	Visual	Stereoscope	
	Polishing	Dremel	extra fine wheel
	Polishing	Sand paper	300 grit.
P37UFP	Visual	Eyes	
	Microscopically	Stereoscope	
	Acetone		
P3MVG7	Cleaning	Sand paper	
PCQJ9D	Polishing	Dremel	N/A
PDJFVL	None		
PEVRGM	Visual	Stereoscope	
PKZJJ7	Cleaning	Acetone	

TABLE 3

<b>Sample Preparation</b>			
<b>WebCode</b>	<b>Method</b>	<b>Tool Used</b>	<b>Grit Size</b>
PR9U67	Visual	Microscope	
	Polishing	Dremel	
PZFB97	Visual	Stereoscope	
Q3GUCJ	Visual	Stereo scope	
	Polishing	Polishing Wheel	
QDJCMM	Visual	Stereo microscope	
	Polishing	Dremel, polishing wheels	
	Visual	Stereo microscope	
QGY8LE	Sanding	Emery paper	1200
QHQUU2	Sanding	Cotton wool	120/600
	Polishing	Dremel	32mm
	Electro acid etch	Green Mamba	
	Visual	Positive pole and negative pole	
	Document	electro magnetic detector	
QM4PKX	Cleaning	Acetone	
	Polishing	Steel wool	
QNZ2K7	None		
QPVYU9	None		
QRXZU6	Visual	Stereoscope	
	Polishing	Dremel	
	None		
QTWKQB	Magnetic Particle Inspection	MagnaFlux/Magnet	
	Polish	Dremel	
	Chemical Etching		
QWM9UV	Polishing	Sand paper	600
R3GEED	Polishing	Dremel	
R47RVA	Polishing	Dremel	
R4A8BW	Polishing	Dremel	
R64DPB	None		

TABLE 3

<b>Sample Preparation</b>				
<b>WebCode</b>	<b>Method</b>	<b>Tool Used</b>	<b>Grit Size</b>	
R7CCLV	Sanding	Sand paper	medium	
RBAA9B	Visual	Microscope		
	Sanding	Sand paper	600, 220, and 120	
RNFK7P	Polishing	Dremel		
	Polishing	Dremel		
RQL36K	None			
RQZR7C	Sanding	Sand paper	400	
RTP6LA	Polishing	Dremel		
T3BJ9C	Polishing	Dremel		
T3QPN2	Visual			
	Polishing	Dremel		
T4ZWPA	Polishing	Dremel		
T7MFNL	Polishing	Dremmel Polisher		
T9BUBB	Polishing	Rotary Tool		
T9FCBU	Polishing	Dremel	NONE	
TDPKMW	N/A	N/A	N/A	
	N/A	N/A	N/A	
TME9GZ	None			
TNBZPA	Sanding	Sand paper	600	
TT92VN	None			
TWNFHA	Polishing	Dremel		
U7LZX8	Visual	Stereoscope		
	Sanding	Sand paper	320A	
UE48XK	Sanding	Sand paper	220, 1000	
UEFGN7	Visual			
UEKJFP	Visual			
	Sanding	Sand paper	220	
	Visual	Sand paper	150	

TABLE 3

Sample Preparation			
<u>WebCode</u>	<u>Method</u>	<u>Tool Used</u>	<u>Grit Size</u>
UG83F2	Polishing	Dremel	
UGNU9T	Polishing	Dremel	
UH2QZH	Sanding	Sand paper	400
UKMAGG	Sanding	Sand paper	600&1200
	None	Steel wool	
URNPN3	Polishing	Sand paper	320, 800, 1500
UT4434	Polishing	Dremel	
UUHDAJ	Polishing	Sand paper	220 AND 400
V7KGT4	Visual	Photography	NIKON D90
	Visual	Stereoscope	Binocular Leica
	Visual	Measurement of milling depth	Caliper Metland
V8YMDZ	Polishing	sand paper extra fine	extra fine
VBZVFP	Sanding		36 grit
	Polishing		
VR2BFQ	Visual		
	Visual	Stereoscope	
VWJVPQ	Visual	Naked eye	
	Visual	Stereoscope	
	Polishing	Dremel	
	Sanding	Sand paper	320
	Sanding	Sand paper	600
W92AY4	Sanding	Dremel	60
	Polishing	Steel wool	
WEVZQ9	Visual		
	Polishing	Dremel	Used in between Fry applications. Fry's was used first prior to any polishing.
WGMY68	Polish	Dremal	
WJ63UP	None		



TABLE 3

<b>Sample Preparation</b>				
<b>WebCode</b>	<b>Method</b>	<b>Tool Used</b>	<b>Grit Size</b>	
WKX3NU	Grinding	Rotary Tool	Craytex wheel, medium grit	
	Sanding	Sand paper	250, 400, 600	
WRH8MA	Sand paper polishing	Sand paper	P 220 very fine grit	
	Polishing/ Rubberized emery wheel	Dremel tool		
WU8K48	Sanding	Sand paper	600	
WWW2BU	Electro magnetic method: Stainless steel bar stock was taken.	Electro-magnetic yoke	no need to sand surface due to polished finish to steel bar	
	Polished and cleaned steel and prepared for recovery of alphanumeric characters to serial numbers	White contrast paint, black highly sensitive black magnetic		
X3H2GY	Polishing	Dremel		
XAFTLL	Polishing	Dremel	NA	
XDBUEN	Cleaning	Acetone		
	Sanding	Dremel	Fine	
XEL3Q4	Grinding	Dremel	fine but used only minimally	
XND8JU	Polishing	Dremel	N/A	
XNWRQM	Visual	Microscope		
XRVLLD	None			
XU3DMW	Polishing	Dremel		
XZR32E	Polishing	Sand paper	220,360,400,600	
Y4AFJG	Visual	Stereoscope		
	Polishing	Dremel	emory wheel	
Y4LJNT	Visual	Microscope	NA	
Y7CDUA	Sanding	Sand paper	400, 220, 320A	
Y8ANPD	Visual	Stereoscope		
Y9X8NP	Sanding	Sand paper	medium	
YGQHWY	None			

TABLE 3

<b>Sample Preparation</b>			
<b>WebCode</b>	<b>Method</b>	<b>Tool Used</b>	<b>Grit Size</b>
YKN3FP	Visual	Eyes	
	Sanding	Dremel	600
	Polishing	Dremel	
	Cleaning	Acetone	
YPLLHN	Sanding	Sand paper	120 Grit
Z39MW4	Mechanical polish	Dremel	extra fine grit
Z7NNVL	Cleaning	Acetone	
ZK4CRW	None		
ZTHY22	Sanding	Sand paper	220
ZY4P3R	Electro-Magnetic Process	Magnetic Yoke	
	Polished area obliterated using Dremel-type tool with grit sandpaper	Dremel machine	
	Sprayed white background lacquer spray	Camera	
	Then applied black magnetic ink	UV light source	
	Then observed and document serial as it appeared	Low voltage power source metal applicators.	
ZYMH7B	None		

**Response Summary**

Participants: 296

**Sample Preparation**

Visual Method: 79

Sanding Method: 85

Polishing Method: 149

None: 35

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

# Recovery Methods

(listed in order of use)

TABLE 4

Recovery Methods		
WebCode	Method	Time
2AG8AP	Electro Chemical Etching	± 2 minutes
2BVK6D	MagnaFlux	
	Fry's Reagent	Repeated applications of ~30 sec
	Acidic Ferric Chloride	Repeated applications of ~30 sec
2F8GJN	MagnaFlux	
	Fry's Reagent	Several seconds at a time
2J9F3T	Acid Etch Method	2 hours
2KYLED	Davis	~2 mins
	Turner's Reagent	~5 mins
	Fry's Reagent	~15 mins
	Dremel- polish	
	Fry's Reagent	~2 mins
2LEY7V	Acidic Ferric Chloride	A total of approximately 5 minutes
	Hydrochloric Acid	A total of approximately 1 minute
	Nitric Acid	A total of approximately 1 minute
2Q77LH	MagnaFlux	
2UW8VD	Fry's Reagent	approx. 15 minutes
2Y6V3M	Acid Etch Method	different acids, all in all about 45 minutes
3AE79X	Fry's Reagent	30 seconds - 1 minute over an approximate 30 minute period
3FK2RX	Fry's Reagent	~30min
3HDDTH	Turner's Reagent	~1 minute
	Fry's Reagent	~2 minutes
	Turner's Reagent	~2 minutes with Fry's
	Fry's Reagent	~2 minutes
	Turner's Reagent	~5 minutes with Fry's
3HE6P6	Griffin's Reagent	2 minutes

TABLE 4

Recovery Methods		
WebCode	Method	Time
3HYL8T	Ferric Chloride Solution	1-2 Min
	Acidic Ferric Chloride	1-2 Min
	25% Nitric Acid	1-2 Min
	50 % HCL	1-2 min
	Fry's Reagent	2-3 Min
3J3LWR	Turner's Reagent	swiped
	Fry's Reagent	swiped
3KGKUW	MagnaFlux	
3MHNLJ	MagnaFlux	approximately 1 minute
	Modified Fry's	approximately 30 seconds
	10% Sodium Hydroxide	approximately 30 seconds
	Modified Fry's	approximately 30 seconds
	Acidic Ferric Chloride	approximately 30 seconds
3NM9XR	Fry's Reagent	approximately 5 to 10 minutes
3VX83X	MagnaFlux	
3YKEMK	Phosphoric/Nitric Acid	1 minute
	Dilute Nitric Acid	1 minute
	Fry's Reagent	1 minute
3YXZ2R	MagnaFlux	
	Acid Etch Method	Davis, Turner's, Fry's ~ 30 seconds each
	Polish - fine cratex wheel	
	MagnaFlux	
	Acid Etch Method	Fry's ~ 1 minute, then Turner's ~ 15 seconds
43R9U2	Acid Etch Method	15 minutes
44P66Q	Turner's Reagent	
	Davis' Reagent	
	Fry's Reagent	
4FZ3EQ	Ferric Chloride	seconds
	Acidic Ferric Chloride	seconds
	25% Nitric Acid	seconds
	10% Sodium Hydroxide	seconds
4JJ3G	MagnaFlux	
4NBDGP	Electro-magnetic	

TABLE 4

Recovery Methods		
WebCode	Method	Time
4VWUXG	Magnetic Particle Inspection (MPI)	
4W89GA	MagnaFlux	
4ZBRTA	Acidic Ferric Chloride	~30 sec. x 5
	Phosphoric Acid / Nitric Acid	~5 sec. x 1
67VAMB	Acidic Ferric Chloride	45 min
	Acidic Ferric Chloride/25 %HNO <sub>3</sub>	50 min
	Modified Fry's Soln.	5min
68NJQV	MagnaFlux	
69HUN9	MagnaFlux	
	Fry's Reagent	30 minutes
	Turner's Reagent	10 minutes
6DTME9	Fry's Reagent	10-15 minutes
6HL4Y6	25% Nitric Acid	varies
	Acidic Ferric Chloride	varies
	Fry's Reagent	varies
6KAXR9	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	>5 min
	Griffin Reagent	>5 min
6LN3AX	001-18-01 Fry's	5 mins
	002-18-01 Turner	5 mins
	003-18-01 Davis	5 mins
6RRQHY	Fry's Reagent	M9V1 - Approx restoration time 1 hour
6VB69K	MagnaFlux	-
6W6PJX	Chemical Etching	20-30 seconds
	Fry's Reagent	20-30 seconds
	Ferric Chloride	20-30 seconds
	Acidic Ferric Chloride	20-30 seconds
6Y8PEP	25% Nitric	1-2 min
	Fry's	1-2 min
	Acidic Ferric	1-2 min
	25% Nitric	1-2 min
	Fry's	1-2 min
	25% Nitric	1-2 min

TABLE 4

## Recovery Methods

WebCode	Method	Time
6ZMTAG	Griffin Reagent	30 min
	Fry's Reagent	15 min
72Y79X	Fry's Reagent	Swabbed approximately 1 hour.
778KNM	Electro-magnetic	
77MQCD	MagnaFlux	
	Turner's Reagent	1 min
	Fry's Reagent	5 min
	Turner's Reagent	1 min
79VZ7V	Davis	1 minute
	Turners	2 minutes
	Fry's	1 minute
	MagnaFlux	2 minutes
7B4XV7	Fry's Reagent	4 - 5 minutes
7CTBAH	Electro-magnetic	
	Electro-acid	3 MINUTES
7KTLQ9	MagnaFlux	
	Fry's Reagent	Five (5) minutes
7MUUVJ	MagnaFlux	
	Fry's Reagent	5 minutes aproximately
7QBA6B	Fry's Reagent	5 minutes
7R8JBL	Electro chemical etching	± 2 minutes
	Green Mamba: composed of: 50ml HCl (Hydrochloric acid), 50ml H2O (Distilled water), 5g CuCl2NHCl2HO (Copper (II) Ammonium Chloride)	
7VQNQW	Forts Solution	APPROXIMATELY 5 MINUTES
7WWM3Y	Fry's Reagent	2 hours
7XXW4M	Ferric chloride	1-3 minutes
	Acidic Ferric Chloride	1-3 minutes
	Aluminum solution (25% sulfuric acid)	1-2 minutes
	Polishing	-1 minute
	Ferric Chloride with Acidic Ferric Chloride	3-6 minutes
	Bill Fort Reagent (highlighter)	1 minute
7ZGY3F	Sirchie Restor-A-Gel	45 minutes

TABLE 4

## Recovery Methods

<b>WebCode</b>	<b>Method</b>	<b>Time</b>
828XUT	MagnaFlux	
88ELAF	Frys	Swabbed approx 20 minutes
88G37J	Electro-acid	5 minutes
89TE9U	Magnetic Particle Inspection (MPI) Valenski's Reagent	30 min.
8K4HBD	MagnaFlux Acid Etch (Nitric Acid/Acidified Ferric Chloride)	wiped with swabs for approximately 5 minutes
8KLUG4	Magnetic Particle Inspection (MPI) Fry's Reagent	
8KMLCQ	Fry's Reagent	4 minutes
8QR9VN	MagnaFlux Fry's Reagent Turner's Reagent	30 seconds 30 seconds
8Y943A	MagnaFlux MagnaFlux Modified Fry's Solution	~5 minutes
93VJFL	Electro-magnetic	
94UJ6L	Modified Fry's Nickles & Alloy Modified Fry's	5 minutes 1 minute 1 minute
98TUZL	Modified Fry's	6 minutes 30 seconds
98WJZC	MagnaFlux Fry's Reagent	~5-10 min intervals of swabbing, repeated multiple times
9DJ7X3	Electro Magnetic Magnaflux white contrast paint Magnaflux MPI ink	
9E9KCE	Electro-acid	30 SECONDS
9F63BV	MagnaFlux Magnetic Particle Inspection (MPI) Davis Reagent Turner's Reagent Fry's Reagent	3 min 3 min 10 min (three times)

TABLE 4

## Recovery Methods

<b>WebCode</b>	<b>Method</b>	<b>Time</b>
9N2QDT	MagnaFlux	
	Griffin Reagent	app. 15 minutes
	Acidic Ferric Chloride	app. 5 minutes
9Q92FN	MagnaFlux	
	Acid Etch Method	Ferric Chloride ~3 minutes
	Acid Etch Method	Nitric Acid ~ 1 minute
	MagnaFlux	
9UNT3B	MagnaFlux	
	Acid Etch Method	~ 5 minutes
	Turner's Reagent	~ 3 hours 2/12/18 ~ 2 hours 2/13/18
9UPHGF	Acid Etch Method	2 - 3 minutes
	Electro-magnetic	2 - 3 minutes
9WCC2M	Fry's Reagent	15'
9WDXZN	Davis's Reagent	1 minute
	Turner's Reagent	1 minute
	Fry's Reagent	2 minutes
	25% Nitric Acid	1 minute
A87L3B	MagnaFlux	
	Modified Fry's	approximately 3 minutes
	20% Nitric Acid	approximately 5 minutes
	Acidic Ferric Chloride	approximately 5 minutes
	10% Sodium Hydroxide	approximately 2 minutes
A9L6BE	Fry's Reagent	<10 sec
	Acidic Ferric Chloride	<10 sec
ABQTQ4	MagnaFlux	
ADDCR2	Magnetic Particle Inspection (MPI)	
ADTMHU	MagnaFlux	
ADX6HD	Electro-acid	Green Mamba (about 2 seconds)
AFLN94	MagnaFlux	N/A
	Fry's Reagent	one minute
ALNQFP	Fry's Reagent	10 MINUTES APPROXIMATELY
AQJ6WU	MagnaFlux	
	Turner's	~5 min
	Griffin's	~10 min



TABLE 4

## Recovery Methods

<b>WebCode</b>	<b>Method</b>	<b>Time</b>
AQPMGD	Fry's Reagent	3 applications; ~4 minutes each
ARVKQU	Fry's Reagent	14 intervals of 30 seconds each
AUNZ3G	Acid Etch Method	15
AX3X8J	Acid Etch Method	Solution #1, 5 Minutes
	Acid Etch Method	Solution #2, 5 Minutes
	Acid Etch Method	Solution #3, 5 Minutes
	Acid Etch Method	Solution #3, 10 Minutes
B3QUEL	Sodium Hydroxide	swabbed vigorously
	Fry's Reagent	approx 1-2 minutes at a time
BBNMNZ	MagnaFlux	
	Fry's Reagent	
BDBMX	Fry's Reagent	5 minutes
BGPTDB	Electro-magnetic	
BKAN8V	Davis/Turners	5 minutes
	Fry's Reagent	5-10 minutes
BL687C	Fry's Reagent	5 minutes
BN8879	MagnaFlux	
BQEG9D	Electro-magnetic	n/a
BQVQ7L	Fry's Reagent	1 minute
BRNLL3	Fry's Reagent	approximately 20 seconds
	Davis' Reagent	approximately 1.75 minutes
BTNTCJ	Magnetic Particle Inspection (MPI)	
BV6HBM	10% Sodium Hydroxide	10 seconds
	Davis	10 seconds
	Fry's Reagent	10 seconds
	Davis Reagent	10 seconds
	Fry's Reagent	10 seconds
BXZFRZ	Magnetic Particle Inspection (MPI)	N/A
	Fry's Reagent	15 minutes

TABLE 4

## Recovery Methods

<b>WebCode</b>	<b>Method</b>	<b>Time</b>
C8GM4U	MagnaFlux	
	Davis Reagent	5x for 30 secs
	Fry's Reagent	~20x for 30 secs
	Nitric Acid 25%	swipe to remove buildup
	Fry's Reagent	~5x for 20-30 seconds
CA7BJB	MagnaFlux	N/A
	Modified Fry's	4 minutes
	10% Nitric Acid	3 minutes
	Sodium Hydroxide	3 minutes
	Modified Fry's	3 minutes
	Acidic Ferric Chloride	3 mintes
	Modified Fry's	3 minutes
	Alternating swabs of above chemicals	20 minutes
CA8N9H	Acid Etch Method	30 min.
CAQCTX	Fry's Reagent	~30 sec. - 2 mins.
	25% Nitric Acid	~30 sec. - 1 min.
CG86JM	Fry's Reagent	4 minutes
	Cleaning & Protecting	Ethanol & Lubricant
CLHA4B	Electro-magnetic	
	Electro-acid	+ - 1 MINUTE
CN7E7F	Chemical treatment 5% NaOH solution	15 minutes
	Electrochemical treatment using Cupric Ammonium Chloride solution	8 minutes
CUBURQ	Davis	less than 2 mins
	Fry's Reagent	3-4 mins
CWFJUZ	Magnetic Particle	
	Acid etching (CuCl <sub>2</sub> )	approx. 3 min
D6AKNN	Magnetic Particle Inspection (MPI)	
DA7ZJQ	Turner's Reagent	2 minutes
	Fry's Reagent	4 minutes
DAYNGM	Fry's Reagent	3 min
DBGYFL	Fry's Reagent	15-30 minutes*
	Turner's Reagent	5-10 minutes*
	Davis	5-10 minutes*
	25% Nitric Acid	15-30 seconds

TABLE 4

Recovery Methods		
WebCode	Method	Time
DBUFRD	Electro-magnetic	
DDY9JR	Fry's Reagent	3 MINUTES
	Fry's Reagent	4 MINUTES
	Fry's Reagent	1.5 MINUTES
	Fry's Reagent	2 MINUTES
DFN2JB	Nitric Acid 25%	3 min.
	Fry's Reagent 100%	5 min.
	Sodium Hydroxide 10%	2 min.
	Final Fry's Reagent 100%	2 min.
DLXLPL	Fry's Reagent	approx. 1-2 minutes
	25% Nitric Acid	approx. 30 seconds
DNLBVK	Fry's Reagent	3 mins
DX9ALQ	MagnaFlux	
	Fry's Reagent	~30 sec - to get better photos of #
DY6AHQ	Fry's	2 min
	25% HNO3	10 sec
E3Z28R	Fry's Reagent	16.5 minutest total
E4VJ89	Fry's Reagent	~30 sec
E6Q3DF	Fry's Reagent	2-5min (6-10x)
E8A4C9	Fry's Reagent	1 min per application
E8TZJ3	MagnaFlux	
	Turner's Reagent	5, intermittently
	Fry's Reagent	25, intermittently
EC8DQG	Acid Etch Method	
	Davis' Reagent	10 minutes
	Turner's Reagent	16 minutes
	Fry's Reagent	1 hour and 15 minutes
EP9RGM	MagnaFlux	N/A
	Fry's Reagent	25 minutes
ER28WF	Ferric Chloride	less than two minutues
	Acidic Ferric Chloride	less than 2 minutes
ERJ2TJ	Fry's Reagent	1-5 minutes

TABLE 4

Recovery Methods		
WebCode	Method	Time
ERLJZV	MagnaFlux	
	Fry's Reagent	approx. 1 min
	Fry's Reagent	approx. 2 min
	Fry's Reagent	approx. 2 min
	Fry's Reagent	approx. 2 min
	Fry's Reagent	approx. 1 min
	10% Nitric Acid w/last Fry's application	
EW8JMV	MagnaFlux	
	Turner's Reagent	10 mins
	Davis' Reagent	30 mins
	Phosphoric/Nitric Acid	10 mins
	Acidic Ferric Chloride	30 mins
	Fry's Reagent	40 mins
EXNXDJ	Fry's Reagent	60 seconds (can be read after 30 seconds)
F4PENP	Turner's Reagent	1-2 minutes
	Fry's Reagent	1-2 minutes
F66VK4	The sample was eaten away chemical solution $\text{CuCl}_2 \cdot 2\text{H}_2\text{O} + \text{HCl} + \text{H}_2\text{O}$	time 30 min.
F93CVC	Acid Etch Method	10 to 15 minutes
F946V6	Magnavis/Magnaflux	
FCKJBY	Electro Magnetic Process	
FGWF8L	MPI	
	#009 Modified Fry's reagent	Approx 2 min
	#011 Modified Turner's reagent (sol #4)	Approx 1 min
FHUMCY	Acidic Ferric Chloride	Multiple passes with a swab
	Fry's Reagent	Multiple passes with a swab
FLQCR7	Davis Reagent	1 minute
	Turner's Reagent	10 minutes
	Fry's Reagent	10 minutes
FRV6UN	Davis	5 min
	Turner's Reagent	swipes
	Fry's Reagent	swipes

TABLE 4

## Recovery Methods

<b>WebCode</b>	<b>Method</b>	<b>Time</b>
FWCDB2	MagnaFlux	
	Fry's Reagent	~2-4 minutes
	Turner's Reagent	~1 minute
FYRNWE	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	15-30 minutes, swabbed
G8N6D2	MagnaFlux	
GCWTMW	MagnaFlux	N/A
GDTYAH	Fry's Reagent	30 MINUTES
GJKB8Z	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	off and on for 20 minutes
GLADDM	Fry's Reagent	
	25% nitric	
GQWAVJ	Acid Etch Method	Ferric Chloride, 15 minutes
	Acidic Ferric Chloride	15 minutes
	Acid Etch Method	25% Nitric Acid, 10 minutes
	Acid Etch Method	Phosphoric/Nitric Acid, 20 minutes
	Acid Etch Method	Davis Reagent, 10 minutes
	Turner's Reagent	10 minutes
	Fry's Reagent	20 minutes
GR8CGH	Acidic Ferric Chloride	several seconds per application
GUGGYC	Modified Fry's	10 mins
	Nickel & Alloy	5 mins
GXCXLE	Electro-magnetic	
H3NBVQ	MagnaFlux	
	Turner's Reagent	~2 mins
	Fry's Reagent	~2 mins
H3NF48	(1) Surface treated with Turner's reagent	20 min
	(2) Surface treated with Fry's reagent	10 min
H6CR3D	Fry's Reagent	10-15 minutes

TABLE 4

Recovery Methods		
WebCode	Method	Time
H9RC2L	ferric chloride	swipes
	Acidic Ferric Chloride	swipes
	Phosphoric / Nitric Acid	5 minutes
	Phosphoric / Nitric Acid	5 minutes
	Phosphoric / Nitric Acid	swipes, 30 minutes
	Phosphoric / Nitric Acid	swipes, 30 minutes
	Phosphoric / Nitric Acid	5 minutes
	Acidic Ferric Chloride	swipes 15 minutes
HE4BJ8	Electrolytic process of etching by HCl acid/ FeCl <sub>3</sub> 5 grams of FeCl <sub>3</sub> , 50 ml of cc. HCl, 100 ml of water	8-10 mins, approximately
HEW8KL	Chemical etching with Hydrochloric Acid 5%	two (2) hours (approx)
HHKQVK	Magnetic Particle	
HJUQMK	MagnaFlux	
HL46GF	Acidic Ferric Chloride	total approx 30 min
	25% Nitric Acid	total approx 30 min
HRL8DA	Electro-Acid Etch Process	8 minutes maximum
	Pre-set the desired voltage	
	Plug the contact points of the two conducting wires into respective sockets	4 to 8 min
	Attach crocodile clips to object to be etched.  Wind a piece of cotton wool round the copper point of the black conducting wire and soak in the etching solution and apply it to the area where the numbers had been affected or suspected to have been effaced.	
HWWL7G	Turner's Reagent	15 seconds
	Acid Etch Method	Davis (15 seconds)
	Fry's Reagent	15 seconds
	Acid Etch Method	Davis (15 seconds)
	Fry's Reagent	45 seconds
JF7232	MagnaFlux	
	Acidic Ferric Chloride	10 minutes
	20% Nitric Acid	10 minutes
JFTRGL	Magnetic Particle Inspection (MPI)	
JPK7A	Fry's Reagent	30 MINUTES
JLW367	Acid Etch Method	five minutes

TABLE 4

## Recovery Methods

WebCode	Method	Time
JNKRPT	Cupric Ammonium Chloride	5 minutes - nil result
	Ferric Chloride	5 minutes - minimal result
	Fry's Reagent	5 minutes - best result
JU89UG	Fry's Reagent	Continually applied swabs with reagent, approx. 10 sec per swab
JVP7GF	Fry's Reagent	4 minutes
JWVTRY	Acid Etch Method	20 minutes
K26D8J	Ferric Chloride	2 minutes
	Acidic Ferric Chloride	5 minutes
K73MNC	MagnaFlux	
	Fry's Reagent	1 min
	Turner's Reagent	1 min
	25% Nitric Acid	5 min
K9MLVF	10% potassium hydroxide	1s
	10% sodium hydroxide	1s
	ferric chloride	1s
	Acidic Ferric Chloride	1s
	phosphoric/nitric acid	1s
	Davis reagent	2s
	Turner's Reagent	2s
	Fry's Reagent	2s
KBVU6Z	Magnetic Particle Inspection (MPI)	
KDZMUR	MagnaFlux	
KH9W2Z	Electro-magnetic	
KLQ69Z	Acidic Ferric Chloride	~ 5 minutes
KU6RKP	Davis	30 sec x 6 applications
	Fry's Reagent	30 sec x 2 applications
L3VRHE	Turner's Reagent	10 sec
	Acid Etch Method	5 sec (HNO <sub>3</sub> + HCl)
	Acid Etch Method	3 x 20 sec (CuSO <sub>4</sub> , HCl)
LDCHXC	MagnaFlux	N/A
	MagnaFlux	N/A
	MagnaFlux	N/A
LERZYW	Fry's Reagent	30

TABLE 4

## Recovery Methods

<b>WebCode</b>	<b>Method</b>	<b>Time</b>
LGH26K	MagnaFlux	
LH8FKG	Fry's Reagent	~ 5 minutes
LJ84A9	Davis	1 minute
	Turner's	1 minute
	Fry's	1 minute
LKUYJU	Electro Magnetic Etching Process	N/A
LKWGTQ	MagnaFlux	
	Fry's	<1 min
LL6T98	Acid Etch Method	15 minutes
LMJFNZ	10% HCL	30 seconds
	Davis Reagent	30 seconds
	Turner's Reagent	60-90 seconds
	Fry's Reagent	90-120 seconds
	Turner's Reagent	5 seconds
LQ3DCQ	MagnaFlux	
	Acid Etch Method	1 min.
	Fry's Reagent	1-2min
LZK4NG	Fry's Reagent	10'
M464TN	Magnetic Particle Method	
M4L7DH	Magnetic Particle	
M4PWCD	Restor-A-Gel - Steel	20-30 minutes
MABWJD	MagnaFlux	
MH8UBM	Acid Etch Method	Two (2) minute
MJ2HRX	MagnaFlux	
MRRGFR	Fry's Reagent	10min
	Fry's Reagent	10min
	Fry's Reagent	10min
MUWQAZ	MagnaFlux	
	Fry's Reagent	2 min.
N36XNN	Fry's Reagent	Less than 1 minute
N42ZE4	Fry's Reagent	



TABLE 4

Recovery Methods		
WebCode	Method	Time
N76UDA	Acid Etch Method	continuous swipes of various acids using cotton tip applicators
NCWEEE	MagnaFlux Fry's Reagent	20 minutes
NHZU27	Electro-magnetic	
NPK3A4	Acidic Ferric Chloride	10 minute
NPYKDA	Fry's Reagent	3 minutes
NTJJKC	MagnaFlux Davis Reagent Turner's Reagent Fry's Reagent	Few seconds per swab. Few seconds per swab. Few seconds per swab.
P37UFP	Davis Reagent - Acid Etch Fry's Reagent	Continuously wiped (~3-4 min) ~2-3 min.
P3MVG7	Acidic Ferric Chloride Fry's Reagent	15 15
PCQJ9D	MagnaFlux	N/A
PDJFVL	MagnaFlux	
PEVRGM	Electro-acid	about 15 min
PKZJJ7	Electro-magnetic	
PR9U67	Acid Etch Method Acid Etch Method Acidic Ferric Chloride Fry's Reagent	10% Sodium Hydroxide - 5 mins 25% Nitric Acid - 5 mins 5 mins 2 mins
PZFB97	Magnetic Particle Inspection (MPI) MagnaFlux	
Q3GUCJ	Acidic Ferric Chloride 20% Nitric Acid	Several cotton swabs for a few seconds. Several cotton swabs for a few seconds.
QDJCMM	Fry's Reagent Fry's Reagent Fry's Reagent Fry's Reagent	3 minutes 3 minutes 1 minute 1 minute
QGY8LE	Fry's Reagent	55 mins

TABLE 4

Recovery Methods		
WebCode	Method	Time
QHQUU2	Frys Acid Etch MagnaFlux	± 2 min
QM4PKX	Fry's Reagent	THIRTY MINUTES
QNZ2K7	Alternating Fry's and 25% Nitric Acid reagents	Approximately 15 - 20 minutes
QPVYU9	Fry's Reagent	Approximately 15 minutes
QRXZU6	Griffin Reagent  Fry's Reagent  Davis' Reagent	Minimal- not left on for a long period of time.  Minimal- not left on for a long period of time.  Minimal- not left on for a long period of time.
QTKWQB	MagnaFlux Chemical Etching	90 seconds 60 seconds
QWM9UV	Electro-acid Electro-magnetic	4MINUTES 30 SECONDS
R3GEED	MagnaFlux Fry's Reagent	1-2 min
R47RVA	Turner's Reagent	15 MIN
R4A8BW	Turner's Reagent Fry's Reagent 25% Nitric Acid	
R64DPB	MagnaFlux Polish w/ dremel tool MagnaFlux polish w/ dremel tool MagnaFlux	
R7CCLV	MagnaFlux	
RBAA9B	Acid Etch Method Fry's Reagent	Davis Reagent approx. 3 minutes Fry's Reagent approx. 12 minutes
RNFK7P	Acidic Ferric Chloride Acidic Ferric Chloride	20 min. 10 min.
RQL36K	MagnaFlux	
RQZR7C	MagnaFlux	

TABLE 4

## Recovery Methods

WebCode	Method	Time
RTP6LA	Acid Etch Method	~1-2 MINUTES
	Acidic Ferric Chloride	~1-2 MINUTES
	Turner's Reagent	~1-2 MINUTES
	Acid Etch Method	~1-2 MINUTES
	Fry's Reagent	~1-2 MINUTES
T3BJ9C	Turner's Reagent	~15 minutes
	~25% nitric acid	~30 seconds
T3QPN2	Fry's Reagent	approx 45 min
	Nitric Acid	approx 5 sec @ a time, approx 5 times
T4ZWPA	Acid Etch Method	~9 MINUTES TOTAL
	Turner's Reagent	4 MINUTES
	Fort's Reagent	5 MINUTES
T7MFNL	Electro acid etching method	± 5 minutes
T9BUBB	MagnaFlux	The "9" and "D" poorly visible
	Fry's Reagent	swabbed continuously for approx. 20 min.
	Turner's Reagent	Used as a highlighter for photo
T9FCBU	Electro-magnetic	N/A
TDPKMW	Fry's directly applied, no preparation of surface was done, the curved markings did not affect my results	
TME9GZ	10% Sodium Hydroxide	
	Turner's Reagent	2 sec
	Fry's Reagent	2 sec
TNBZPA	MagnaFlux	N/A
	Fry's Reagent	~30 sec increments
	MagnaFlux	N/A
TT92VN	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	Few minutes
TWNFHA	Fry's Reagent	3 MINUTES
	DAVIS REAGENT	2 MINUTES
	AQUA REGIA	2 MINUTES
U7LZX8	Fry's Reagent	2 minutes
UE48XK	MagnaFlux	None
UEFGN7	MagnaFlux	2 minutes
	Fry's Reagent	2 minutes each application

TABLE 4

## Recovery Methods

<b>WebCode</b>	<b>Method</b>	<b>Time</b>
UEKJFP	MagnaFlux	
UG83F2	Acidic Ferric Chloride	Ten minutes
UGNU9T	MagnaFlux	
	Fry's	10-15 min.
	Davis	20-30 min.
	Fry's	5-10 min.
	MagnaFlux	
	Fry's	5-10 min.
UH2QZH	MagnaFlux	
UKMAGG	Fry's Reagent	1 - 2 minutes, reapplied 3 times with sanding in between.
URNPN3	Fry's Reagent	5s x 3 times
UT4434	Fry's Reagent	1-2 minutes
UUHDAJ	MagnaFlux	
V7KGT4	Application of an acid solution	4 x 5 minutes
V8YMDZ	Ferric Chloride	few minutes at a time
	Acidic Ferric Chloride	few minutes at a time
	10 % sodium hydroxide	few minutes at a time
	25 % Nitric Acid	few minutes at a time
VBZVFP	MagnaFlux	
VR2BFQ	Acid Etch Method	
	Acidic Ferric Chloride	approximately 45 seconds
	Nitric Acid	approximately 45 seconds
	Modified Fry's	approximately 3-4 minutes
	Sodium Hydroxide	approximately 10-15 seconds
VWJVPQ	Turner's Reagent	~5 minutes
	Fry's Reagent	~5 minutes
W92AY4	Turner's Reagent	3 seconds between each swipe
	Fry's Reagent	3 seconds between each swipe
WEVZQ9	Fry's Reagent	Intermittently over 6 hours

TABLE 4

Recovery Methods		
WebCode	Method	Time
WGMY68	Fry's Reagent	
	Turner's Reagent	
	Davis Reagent	
	Nitric Acid	
	Acidic Ferric Chloride	
	Ferric Chloride	
	Aluminum Solution	
WJ63UP	Magnetic Particle Inspection (MPI)	
	Davis Reagent	30 seconds (x3)
	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	30 seconds
	Davis Reagent	30 seconds
	Polish	
	Fry's Reagent	30 seconds
	Davis Reagent	30 seconds
	Fry's Reagent	30 seconds
	Davis Reagent	30 seconds
	Fry's Reagent	30 seconds
Davis Reagent	30 seconds	
WKX3NU	Acidic Ferric Chloride	15 sec
	Turner's Reagent	15 sec
	Davis	15 sec
	Nitric Acid	15 sec
	Fry's Reagent	5 sec
	MagnaFlux	
WRH8MA	MagnaFlux	N/A
	Ferric Chloride	~30 - 1 hour (no-response)
	Fry's Reagent	~1 hour - 2 hours
WU8K48	MagnaFlux	N/A
	Davis' Reagent	~1/2 hour
	Turner's Reagent	~1/2 hour
	Fry's Reagent	~15 minutes
WWV2BU	Electromagnetic recovery method	N/A
X3H2GY	Turner's Reagent	not long
	Fry's Reagent	not long
XAFTLL	Acidic Ferric Chloride	Approximately 15 minutes

TABLE 4

Recovery Methods		
WebCode	Method	Time
XDBUEN	Electro-magnetic	
XEL3Q4	Fry's Reagent	5-8 seconds alternating with Turner's
	Turner's Reagent	5-8 seconds alternating with Fry's
	25% Nitric acid swabbed twice to highlight area	5 seconds each swab
XND8JU	Fry's Reagent	45 Minutes
XNWRQM	MagnaFlux	
XRVLDD	Fry's Reagent	5 MIN
XU3DMW	Fry's Reagent	Approximately 1 minute
XZR32E	MagnaFlux	3 minute
Y4AFJG	Fry's Reagent	intervals of 30 seconds for total of ~ 15 min.
	Acid Etch Method	25% Nitric Acid Reagent, 5 min.
Y4LJNT	Acid Etch Method	At Interval of 1-2 minutes
Y7CDUA	Davis Reagent	
Y8ANPD	MagnaFlux	
Y9X8NP	MagnaFlux	n/a
	Fry's Reagent	5 minutes
YGQHWY	Acidic Ferric Chloride	4 minutes
	Acidic Ferric Chloride	3 minutes
	Acidic Ferric Chloride	3 minutes
	Acidic Ferric Chloride	3 minutes
YKN3FP	Electro-acid	Green mamba (+- 2 seconds)
YPLLHN	Electro-magnetic	
Z39MW4	Fry's followed by Davis	until color change stopped ~5-10 sec
	10% NaOH	until color change stopped ~5-10 sec
	Fry's followed by Davis	until color change stopped ~5-10 sec
Z7NNVL	Electro-magnetic	
ZK4CRW	Turner's Reagent	5 to 30 seconds each time (alternating with Fry's)
	Fry's Reagent	5 to 30 seconds each time (alternating with Turner's)
	Acetone	rinsed bar (less than 5 seconds)

TABLE 4

Recovery Methods		
WebCode	Method	Time
ZTHY22	Fry's Reagent	50% solution Roughly 10 seconds
	25% Nitric Acid	Roughly 10 seconds
	Fry's Reagent	Roughly 10 seconds
	25% Nitric Acid	Roughly 10 seconds
	Sanding/Dremel	(P1/3. process repeated 6 times)
	Fry's Reagent	Roughly 10 seconds (P2/3. process repeated 6 times)
	25% Nitric Acid	Roughly 10 seconds (P3/3. process repeated 6 times)
	Fry's Reagent	Roughly 10 seconds (P1/2. process repeated 5 times)
	25% Nitric Acid	Roughly 10 seconds (P2/2. process repeated 5 times)
ZY4P3R	Fry's Reagent Applied chemical solution to the area of obliteration utilizing cotton tip applicators or swab that was moistened with appropriate chemical reagent or solution, and number became visible. I documented numbers as soon as they appeared	± 1 minute
ZYMH7B	MagnaFlux	

Response Summary		Participants:296
Recovery Methods		
Chemical Processing:	220	
Magnetic Processing:	124	
<p>Note: The total recovery methods used are not equivalent to the total number of participants because some participants used more than one recovery method.</p>		

## Additional Comments

TABLE 5

WebCode	Additional Comments
2F8GJN	I used MagnaFlux prior to any preparation of the sample to see if any characters could be visualized, and I observed most of the characters. Then I used the Dremel tool and sandpaper prior to using the Fry's reagent. The Fry's reagent was applied with a cotton swab and left on for several seconds before it was wiped off. This step was done numerous times until all the characters were visualized.
2J9F3T	The Item 1 metal flat bar was slightly magnetic. The last digit was too close to the edge of obliteration. The Aluminum standard was used to compare the restored serial number of Item 1.
2Q77LH	1. Visual Inspection 2. No serial number noted. 3. MagnaFlux revealed serial number K1J9D6.
2Y6V3M	After smoothing the surface softly with sand paper we rubbed the surface with acid saturated cotton swabs. The difficulty to reconstruct the serial number on this steel bar stock was comparable, even if a bit more difficult, to the steel bar stock last year.
3AE79X	The Fry's Reagent was diluted with distilled water in a 1:1 ratio. The Fry's Reagent was applied to the bar stock, Item 1, in 30 seconds to 1 minute intervals for approximately 30 minutes. Between applications of the Fry's reagent, NaHCO <sub>3</sub> was applied.
3J3LWR	Other = Nitric Acid 25%
3MHNLJ	Expected reactions from restoration reagents were observed.
4JJZ3G	Tested to see if magnetic before having to use any acid etching. Item 1 is magnetic so first choice was to use MagnaFlux. Serial number was visible.
4W89GA	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.
6KAXR9	Although 303 Stainless is said not to be magnetic, sample was magnetic to a lesser degree than experience with most non-stainless steels. Electromagnetic Particle method: Sanded area with 320, 600 then 1200 grit sandpaper removing some of the milling marks. Polished area lightly with electric buffer using chromium oxide as polishing abrasive. Sprayed prepared surface with Magnavis white contrast background paint then Magnavis 7HF prepared bath (magnetic). Chemical Etching Method: Surface was cleaned with acetone then treated with Fry's Reagent. Surface was then washed with water, sanded further to remove most of the milling marks, re-polished then Griffin Reagent applied.



TABLE 5

WebCode	Additional Comments
6RRQHY	Suggestions: 1. How about testing us on multiple different series of stamped characters like we must do in the real world? Rarely do we have a straight "normal" restoration like these tests. We typically restore characters under other characters put into the substrate by the offender. It is then up to our expertise and knowledge to provide an opinion on which characters are genuine and which are not genuine. 2. Perhaps stop giving the same tests to multiple people in the same unit at the same time.
6W6PJX	Progress on restoration was not from any one chemical. Progress was from a combination of these chemicals.
7R8JBL	The electrochemical etching begins with the coupling of a light electric current to the firearm. The positive pole attached to the firearm or piece of steel and the negative pole attached to a stainless steel rod with a piece of cotton wool twisted around the tip. The cotton wool is dipped into an acid solution. Everytime the rod touches the firearm, a small current will flow through the cotton wool and the steel. Starting with the low current and adjust systematically to higher settings. The number starts appearing within $\pm 2$ minutes.
8KLUG4	WE USE MAGNETIC YOKE AND WET MAGNETIC POWDER
9UNT3B	Magnaflux was used first and all of the characters were visible but not all were legible. Then the dremel tool with the buffing wheel was used to polish the surface. Magnaflux was used again and the K was made legible. The use of the dremel tool with the buffing wheel and magnaflux was repeated, but no change in the clarity of the characters was observed. Then 25% Nitric acid was used but no change occurred. Turner's Reagent was used next and after reapplication over a few hours the characters progressively became more legible. The Turner's reagent was removed and the area was sanded with 400p grit sand paper. Then more Turner's Reagent was applied and the serial number was restored. The serial number was cleaned and magnaflux was applied but it didn't enhance the serial number much.
ALNQFP	All characters in the serial number were completely restored.
AQJ6WU	It was assumed that the only characters available were the characters on the provided aluminum block for the purposes of this test.
AX3X8J	Acid restoration solutions #1 and #2 had no effect. After applying solution #3 for 5 minutes the number appeared but was faint. I applied solution #3 a second time for 10 minutes to further enhance the restored number. The process was documented with photography.
BN8879	Magnaflux was applied initially. Then sanding was done lightly with steel wool (Brillo Pad) and Magnaflux applied again.
CAQCTX	Exhibit #1A was in the coin envelope labeled as Item 1.
DBGYFL	* Reagents were not always left in place for the time duration noted. A Q-Tip was used to disperse the reagents.
DFN2JB	Recovered serial number was photographed & images retained in the laboratory image file/server.

TABLE 5

WebCode	Additional Comments
DX9ALQ	This test was not representative of real world case examples in any way. The examiner rarely knows the exact type of metal used for a firearm. The surface is rarely perfectly flat. The obliteration method rarely leaves such a smooth surface that nothing needs to be done to it to proceed with the restoration. This restoration took about 30 seconds. I did no polishing, and simply stuck the bar on a flat magnet and applied some MagnaFlux Prepared Bath to it. About 10 seconds later the number was clearly visible. I did swab with Fry's Reagent for about 30 seconds total in order to get a nice clear picture of the number for my file because taking a photo of the MagnaFlux number was difficult, but it was not necessary to see the number.
E6Q3DF	Order of restoratoion was : the 6; the K and 1; the J; the D; and lastly the 9
ERLJZV	Sanding as a part of surface preparation was applied to Item 1 after the Magnetic Particle Inspection (MagnaFlux) attempt, but before any chemical etchants (Fry's & 10% Nitric Acid) were applied. Visual methods of inspection, as well as microscopic and photographic methods were done prior to ANY and all physical surface preparation (sanding) or chemical restoration attempts. The 10% Nitric Acid was applied to Item 1 in conjunction with the last application of Fry' Reagent as a highlighter.
F4PENP	Questions regarding this report should be addressed to: [Email].
F93CVC	The visual examination of the "Item 1" revealed the presence of filing marks on the center of the bar. Grease was applied to the bar after the serial number was restored.
G8N6D2	Nothing was done to prepare the sample prior to the Magnaflux treatment, as Magnaflux is non-destructive in nature.
GLADDM	This was a fair test and much more applicable to real casework than the previous CTS SNR test. I like the standard included with the test.
GQWAVJ	Item was found to be non-magnetic however, the etchants suggested for non-magnetic materials were unsuccessful for restoration, switched to etchants suggested for magnetic (ferrous) materials and restoration was successful.
HRL8DA	After the application of the etch process the surface must be thoroughly cleaned with an acid neutralizing agent agent such as ammonia or carbonate of soda solution and covered with vaseline, oil or other protective agent to prevent unnecessary corrosion.
HWWL7G	The milling marks are very heavy on the sample. If one were to sand the surface smooth it would likely go through the numbers. This has been brought up in the past with no change in the design of the sample.
JNKRPT	At the beginning the first digit "K" was very faint compared to the other five restored digits.
JU89UG	The serial number on Item 1 had been mechanically removed. After polishing and applying a chemical etchant, the serial number on Item 1 was restored to K1J9D6.
JWVTRY	Alternated Fry's Reagent with 20% solution of Nitric Acid for approximately 20 minutes, until digits clear. Photos taken before treatment and upon the completed item.
LL6T98	I found filing marks on the area bearing the suspected obliterated serial number.

TABLE 5

WebCode	Additional Comments
LQ3DCQ	230/5000. 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.
MJ2HRX	1. Visual exam: No serial number noted. 2. MagnaFlux: Serial number developed. Unclear on letter/digit #5: D/O
N36XNN	Photographs were taken prior to and after the restoration.
PR9U67	Tried 10% Sodium Hydroxide with 25% Nitric Acid, followed by Acidic Ferric Chloride, then Fry's reagent with Acidic Ferric Chloride until it was readable.
Q3GUCJ	Photos were taken before & after recovery.
QHQUU2	It was a fruitful exercise the results came just after the application of Electro Acid Etching method was used.
R4A8BW	chemical restoration reagents were continually swiped across the surface of the bar stock with a swab
T3BJ9C	The suspect area was polished with a polishing wheel on a dremel tool. Turner's Reagent was applied to the suspect area for ~15 minutes. The characters K1J_D6 were legible. The fourth character was visible; however, it was not legible at this time. 25% nitric acid was applied to the suspect area for ~30 seconds. The serial number was then legible as K1J9D6. Clear fingernail polish was then applied to the suspect area.
T9BUBB	The obliteration was caused by end mill drilling. There were no characters visible before processing.
T9FCBU	THE NUMBER WAS EASIER TO RETRIEVE AFTER MIRROR SHINING AND POLISHING THE AFFECTED AREA
TWNFHA	FULL RESTORATION OF SERIAL NUMBER K1J9D6
UH2QZH	According to the methodology should be used the least destructive method to the more destructive, in this case only used the Magnaflux method, giving positive result
W92AY4	Turner's and Fry's reagents were alternated for approximately 15 Mins
WEVZQ9	The middle character next to the J was never fully visible. Only the right hand side could be restored. The character most resembled a backwards C.
WRH8MA	The Aluminum standard characters are not even close in the size & shape of some of the recovered characters and numbers. Like material needs to be used for reference standards in the future.
WU8K48	Acids were tested with a positive reaction prior to use.
XZR32E	I proceeded to restore the series, starting with a non-destructive method which gave positive results. Therefore, the chemical method was not necessary to apply.

TABLE 5

<b>WebCode</b>	<b>Additional Comments</b>
YGQHWY	Immersion oil was used to enhance visual contrast following each treatment with Acidic Ferric Chloride. The immersion oil was cleaned from the surface of Item #1 using methanol prior to any subsequent Acidic Ferric Chloride treatment.
YPLLHN	The fourth character from the left was not clearly visible during electro magnetic etching process
ZY4P3R	I began with electro-magnetic process and then followed by electro-acid etching process.

# Appendix: Data Sheet

Collaborative Testing Services ~ Forensic Testing Program

## Test No. 18-5250: Serial Number Restoration

DATA MUST BE RECEIVED BY March 19, 2018 TO BE INCLUDED IN THE REPORT

Participant Code:

WebCode:

### Accreditation Release Statement

CTS submits external proficiency test data directly to ASCLD/LAB, ANAB, and 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 or A2LA. (Accreditation Release section on the last page must be completed and submitted.)

This participant's data is NOT intended for submission to ASCLD/LAB, ANAB or A2LA.

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.

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

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

#### 1.) Please record the restored characters below.

The serial number on this material consists of 6 characters.

Item 1: \_\_\_\_\_

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

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Please return all pages of this data sheet.

Participant Code:

WebCode:

Additional Testing Information

**3.) What methods were used to prepare the sample prior to attempts at recovery?  
e.g. Sanding, Polishing, Visual, etc. (Please describe in order.)**

Method	Tool used	If sanding was done what grit size was used?
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

**4.) What recovery methods were used during your examination?  
e.g. 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?
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

**Please return all pages of this data sheet.**

Participant Code:

WebCode:

**5.) Additional Comments**

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**Return Instructions:** Data must be received via online data entry, fax (please include a cover sheet), or mail by **March 19, 2018** to be included in the report. Emailed data sheets are not accepted.

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

Participant Code:

ONLINE DATA ENTRY: [www.cts-portal.com](http://www.cts-portal.com)

FAX: +1-571-434-1937

MAIL: Collaborative Testing Services, Inc.

P.O. Box 650820

**Please return all pages of this data sheet.**

Page 3 of 4

## RELEASE OF DATA TO ACCREDITATION BODIES

The following Accreditation Releases will apply only to:

Participant Code:

Webcode:

for Test No. **18-5250: Serial Number Restoration**

This release page must be completed and received by **March 19, 2018** to have this participant's submitted data included in the reports forwarded to the respective Accreditation Bodies.

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**

Signature and Title \_\_\_\_\_

Laboratory Name \_\_\_\_\_

Location (City/State) \_\_\_\_\_

#### **Return Instructions**

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

#### **Accreditation Release**

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

**Please return all pages of this data sheet.**

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