



Serial Number Restoration Test No. 16-5250 Summary Report

This test was sent to 344 participants. Each participant received a sample pack containing a piece of zinc 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 302 participants (88% response rate) 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 zinc 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 (D7J274).

SAMPLE PREPARATION-

Each sample set contained a piece of 1" x 1/4" x 2.5" zinc bar stock that was stamped using a punch press. The stamp consisted of 6 characters (D7J274) that are 1/8" in height. The serial number was then obliterated by removing material from the bar stock using a vertical milling machine. A consistent amount of material was removed from each piece of bar stock.

A piece of aluminum bar stock was also included in the sample set and was intended as a standard for size, shape, and positioning of the stamped alphanumeric characters used in the serial number. The alphanumeric characters are digits 0-9 and letters A-F, H, J, K and N that are 1/8" in height.

SAMPLE SET ASSEMBLY: An Item 1 was enclosed in chip board and the sides taped to securely contain the sample. The aluminum standard was wrapped 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: Three predistribution laboratories restored the obliterated six character serial number and reported "D7J274". All three laboratories used a 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 zinc 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 (D7J274). (Refer to Manufacturer's Information for preparation details.)

Of the 302 responding participants in Table 1: "Recovered Characters", 263 (87%) recovered the six characters consistent with the Manufacturer's Information. Twelve participants made a partial recovery of the expected characters, and eleven participants made a full or partial recovery with one or two reported characters that were different from, but similar in shape to, the expected characters. The remaining sixteen participants did not recover any of the characters.

In Table 3: "Preparation Methods", the majority of participants used polishing or sanding 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 restored characters below.

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
26JQKN	D	7	J	2	7	4
27EALP	D	7	J	2	7	4
2ACVB8	D	7	J	2	7	4
2B8DD9	D	7	J	2	7	4
2BNLMW	D	7	J	2	7	4
2CJ4NX	?	?	?	?	?	?
2NTQPH	D	7	J	2	7	4
2P7FRV	D	7	J	2	7	4
2QJRWR	D	7	J	2	7	4
2QXCGP	D	7	J	2	7	4
2QZ9ME	D	7	J	2	7	4
2WKBKH	D	7	J	2	7	4
2XW2XT	D	7	J	2	7	4
2ZQHH3	D	7	J	2	7	4
32BX2A	0	7	J	2	7	4
33R6BX	D	7	J	2	7	4
34923X	D	7	J	2	7	4
3836JH	D	7	J	2	7	4
3B64WW	D	7	J	2	7	4
3BZQBL	D	7	J	2	7	4
3D6C27	D	7	J	2	7	4
3MUZXU	D	7	J	2	7	4
3NPHZV	D	7	J	2	7	4

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
3PK7EK	D	7	J	2	7	4
3QFPFL	D	7	J	2	7	4
3RTGBN	D	7	J	2	7	4
3UD7U2	D	7	J	2	7	4
3ZJYPW	D	7	J	2	7	4
438NVV	D	7	J	2	7	4
477ZQV	D	7	J	2	7	4
482HTW	D	7	J	2	7	4
4GK94M	D	7	J	2	7	4
4LE34A	D	7	J	2	7	4
4R2QYE	D	7	J	2	7	4
4TFF2R	D	7	J	2	7	4
4TG2TD	D	7	J	2	7	4
4UVG6U	D	7	J	2	7	4
4WDWEL	/	/	/	/	/	/
4XR3XH	D	7	J	2	7	4
672RCF	D	7	J	2	7	4
6DFXMD	D	7	J	2	7	4
6DYT6E	D	7	J	2	7	4
6EYJLV	D	7	J	2	7	4
6HCJJM	D	7	J	2	7	4
6KKLGE	D	7	J	2	7	4
6N3UTK	D	7	J	2	7	4
6RNJDX	D	7	J	2	7	4
6TVWUY	D	7	J	2	7	4

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
6XBJEW	D	7	J	2	7	4
78VZW6	D	7	J	2	7	4
7WCH7J	D	7	J	2	7	4
7WPCHD						
7YFDPM	D	7	J	2	7	4
86Y4M2	D	7	J	2	7	4
88QYAA	D	7	J	2	7	4
8ATXMN	D	7	J	2	7	4
8DEM6F	D	7	3	2	7	4
8GC4GA	D	7	J	2	7	4
8XYGXM	D	7	*	2	7	4
92WHBP	D	7	0	2	7	4
94H7TG	D	7	J	2	7	4
96T7RW	D	7	J	2	7	4
97A3JV	D	7	J	2	7	4
97NPTX	D	7	J	2	7	4
99XRPU	D	7	J	2	7	4
9E3B6M	D	7	J	2	7	4
9EKJTG	D	7	J	2	7	4
9FY4LR	D	7	J	2	7	4
9K4Y98	D	7	J	2	7	4
9KN9QN	D	7	J	2	7	4
9L3XU2	D	7	*	*	7	4
9MVQPK	D	7	J	2	7	4
9N8HJM	D	7	J	2	7	4

TABLE 1

WebCode	<u>Character 1</u>	<u>Character 2</u>	<u>Character 3</u>	<u>Character 4</u>	<u>Character 5</u>	<u>Character 6</u>
9Q3Y6W	D	7	J	2	7	4
9QBD4P	D	7	J	2	7	4
9T3CF3						
9XYRDQ	D	7	J	2	7	4
9Y76NC	D	7	J	2	7	4
A73MD9	D	7	J	2	7	4
A8ZNN7						
AA4JAV	D	7	J	2	7	4
ACA28Q	D	7	J	2	7	4
ADMNRQ	D	7	J	2	7	4
AEYADL	D	7	J	2	7	4
AJDY2N	D	7	J	2	7	4
AJM3G9	D	7	J	2	7	4
AJRJE7	D	7	J	2	7	4
ALYRUH	D	7	J	2	7	4
AVGH79						
AXBZT4	D	7	J	2	7	4
B284XV	D	7	J	2	7	4
B4ELVR	D	7	J	2	7	4
B67GKL	D	7	J	2	7	4
BAHHP	D	7	J	2	7	4
BHFXRQ	D	7	J	2	7	4
BWCAZU	D	7	J	2	7	4
BWXQFX	D	7	J	2	7	4
BZCKVU	D	7	J	2	7	4

TABLE 1

WebCode	<u>Character 1</u>	<u>Character 2</u>	<u>Character 3</u>	<u>Character 4</u>	<u>Character 5</u>	<u>Character 6</u>
C4T88E	D	7	J	2	7	4
C4VPEP	D	7	J	2	7	4
C6Q9FR	D	7	J	2	7	4
CAGUZY	D	7	J	2	7	4
CAV438	D	7	J	2	7	4
CCKPJ2	D	7	J	2	7	4
CGG7YG	D	7	J	2	7	4
CNGTNV	D	7	J	2	7	4
CYJQW6	D	7	J	2	7	4
CZPHF6	D	7	J	2	7	4
D8MK7N	D	7	J	2	7	4
DDABPX	D	7	J	2	7	4
DFFTQE	D	7	J	2	7	4
DGXMRN	D	7	J	2	7	4
DHNT8E	D	7	J	2	7	4
DRF6JV						
DTLUKJ	D	7	J	2	7	4
DV2MC	D	7	J	2	7	4
E2WBVP	D	7	J	2	7	4
E6Y96W	D	7	J	2	7	4
E77NDN	D	7	J	2	7	4
E7QG4Z	D	7	J	2	7	4
E9WUUE	D	7	J	2	7	4
EHZ63P	D	7	J	2	7	4
EJTX9	D	7	J	2	7	4

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
EJYBJJ	D	7	J	2	7	4
EP43WM	D	7	J	2	7	4
EQU347	D	7	J	2	7	4
ERB8L6						
ERPVPH	D	7	J	2	7	4
EUFYDH	D	7	J	2	7	4
F33DUT	D	7	J	2	7	4
F4JCCX	D	7	J	2	7	4
F8VGLC	D	7	J	2	7	4
F9QZMD	D	7	J	2	7	4
F9TPUW	D	7	J	2	7	4
FM9WK2	D	7	J	2	7	4
FR6CHP	D	7	J	2	7	4
FTX96X	D	7	J	2	7	4
FV4TTX	D	7	J	2	7	4
FYLT9D	D	7	3	2	7	4
G7GCPZ	D	7	J	2	7	4
G88KP3	D	7	J	2	7	4
GA4PQQ	*	7	*	2	7	4
GBXHLA	D	7	J	2	7	4
GCAAGC	D	7	J	2	7	4
GF7XVX	D	7	J	2	7	4
GG8LKN	D	7	J	2	7	4
GJAW7Q						
GLDFEK	D	7	J	2	7	4

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
GUMWZY	D	7	?	2	7	4
GVZPED	D	7	J	2	7	4
GWV7QB	D	7	J	2	7	4
GWYJMJ	D	7	J	2	7	4
H24RGT	D	7	0	2	7	4
H7CC36	D	7	J	2	7	4
H8BHJY	D	7	J	2	7	4
HC7ATG	D	7	J	2	7	4
HX6B7K	D	7	J	2	7	4
J46GW8	D	7	J	2	7	4
J4M4UN	D	7	J	2	7	4
J6ZZX9	D	7	J	2	7	4
J7FAYL	D	7	J	2	7	4
JEL2F4	D	7	J	2	7	4
JEQCKM	D	7	?	?	7	4
JGQNVT	D	7	?	2	7	4
JKEZWJ	D	7	J	2	7	4
JKQZQT	D	7	J	2	7	4
JLLHTU	D	7	J	2	7	4
JNECRJ	D	7	J	2	7	4
JP7B4W	D	7	J	2	7	4
JRXGBF	D	7	3	2	7	4
JT99GB	D	7	J	2	7	4
JYWTKQ	D	7	J	2	7	4

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
K3K6MZ	D	7	J	2	7	4
K4KTEC	D	7	J	2	7	4
K4ZEND	D	7	J	2	7	4
K7PK44	D	7	J	2	7	4
K9V7WB	D	7	J	2	7	4
KALAKB	D	7	J	2	7	4
KCV792	D	7	J	2	7	4
KD8UR2	D	7	J	2	7	4
KRT9VZ	D	7	J	2	7	4
KXFWQ7	D	7	J	2	7	4
KZLGFQ						
L36WLC	D	7	J	2	7	4
L4HKM4	D	7	J	2	7	4
LG4ZQ4	D	7	J	2	7	4
LGNLG9	D	7	J	2	7	4
LGPBMQ	D	7	J	2	7	4
LHVXXA	D	7	J	2	7	4
LJQGZB	D	7	J	2	7	4
LN3JQD	D	7	J	2	7	4
LQD8M7	D	7	J	2	7	4
LV4JLA	D	7	J	2	7	4
LV92K8	D	7	J	2	7	4
LVJZG3	D	7	J	2	7	4
LVPC3D	D	7	J	2	7	4
M4TPUZ	D	7	J	2	7	4

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
M4Y2FC	D	7	J	2	7	4
M6P8W3	D	7	J	2	7	4
M73WYE	D	7	J	2	7	4
M8UVBR	D	7	J	2	7	4
MD7UTC	D	7	J	2	7	4
MGHQB8	D	7	J	2	7	4
MMNK64	D	7	J	2	7	4
MRK49M	D	7	J	2	7	4
MU9FAD	D	7	J	2	7	4
MVZCY8	D	7	J	2	7	4
MWYLQ4	D	7	J	2	7	4
MZYPKC	D	7	J	2	7	4
N6MWFP	D	7	J	2	7	4
N7HFGQ	D	7	J	2	7	4
NF84EE	D	7	J	2	7	4
NFJZJJ	D	7	J	2	7	4
NMGRQR	D	7	J	2	7	4
NQ64RH	*	7	*	2	7	4
NRW34V	D	7	J	2	7	4
NTUDYY	D	7	J	2	7	4
NWTRK3	D	7	J	2	7	4
NX7GP2	D	7	J	2	7	4
PAF8BA	D	7	J/O	2	7	4
PGC969	D	7	J	2	7	4
PJXXMZ	D	7	3	2	7	4

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
PL4HDK	D	7	J	2	7	4
PP8ZPV						
PWLY6R	D	7	?	2	7	4
PZKB4D	D	7	J	2	7	4
Q2A4B2	D	7	0	2	7	4
Q7TYET	D	7	J	2	7	4
Q9XLV4	D	7	J	2	7	4
QA9NH3	D	7	J	2	7	4
QAT6X7	D	7	J	2	7	4
QD9ZD3	D	7	J	2	7	4
QLYKGF	*	*	*	*	7	4
QRPVRE	D	7	J	2	7	4
QUE4YU	D	7	J	2	7	4
QY82Q7	D	7	J	2	7	4
R6TFRH	D	7	J	2	7	4
RD7CU4	D	7	J	2	7	4
RDLTPW	D	7	J	2	7	4
RKPVUW	D	7	J	2	7	4
RL43FE	D	7	J	2	7	4
RNQRLD	D	7	J	2	7	4
RPG3C7	0	7	*	2	7	4
RR2QUX	D	7	3	2	7	4
RR79TW	D	7	J	2	7	4
RZWX6Q	D	7	J	2	7	4
T6PDDX	D	7	J	2	7	4

TABLE 1

WebCode	<u>Character 1</u>	<u>Character 2</u>	<u>Character 3</u>	<u>Character 4</u>	<u>Character 5</u>	<u>Character 6</u>
TC8L4F	D	7	?	2	7	4
TKZ48P						
TQ7MH2	D	7	J	2	7	4
TXN2G2	?	?	?	2	7	4
TXQQNJ	D	7	J	2	7	4
U2YFFQ	D	7	J	2	7	4
U8BEXC	D	7	J	2	7	4
UDWAYF	D	7	J	2	7	4
UJ34VW	D	7	J	2	7	4
UP7YQP						
UVWA2N	D	7	J	2	7	4
UYWKWN	D	7	J	2	7	4
UZNR37	D	7	J	2	7	4
V62RZX	D	7	J	2	7	4
VE976K	D	7	J	2	7	4
VJZQV8	D	7	J	2	7	4
VM3CZ8	D	7		2	7	4
VP6ABZ	D	7	J	2	7	4
VRA33D	D	7	J	2	7	4
VYBGNE	D	7	J	2	7	4
VZ68UT	D	7	J	2	7	4
W2F8QM	D	7	J	2	7	4
W4LRF9	D	7	J	2	7	4
W8L3AM	D	7	J	2	7	4
WBJJMG	D	7	J	2	7	4

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
WCARLK	D	7	J	2	7	4
WD8VN9						
WFA3HK	D	7	J	2	7	4
WGAUYZ	D	7	J	2	7	4
WL22EN	D	7	J	2	7	4
WL79U3	D	7	J	2	7	4
WQWTP7	D	7	J	2	7	4
WRRBR8	D	7	J	2	7	4
WTK8DF	D	7	J	2	7	4
WTMY7W	D	7	J	2	7	4
WXJHC2	D	7	J	2	7	4
XA4J3R	D	7	J	2	7	4
XNM3Z3	D	7	J	2	7	4
XQEYNW	D	7	J	2	7	4
Y8DM7L						
Y96TC4	D	7	J	2	7	4
YBWP2X	D	7	J	2	7	4
YKDLTH	D	7	J	2	7	4
YKNYU2	D	7	J	2	7	4
YMPC8T	D	7	J	2	7	4
YXBFER	D	7	J	2	7	4
Z9JKYT	D	7	J	2	7	4
ZAXZG2	D	7	J	2	7	4
ZDHU9V	D	7	J	2	7	4
ZE9ZPL	D	7	J	2	7	4

TABLE 1

WebCode	<u>Character 1</u>	<u>Character 2</u>	<u>Character 3</u>	<u>Character 4</u>	<u>Character 5</u>	<u>Character 6</u>
ZJMXW9	D	7	J	2	7	4
ZL47ZE						
ZX3V4U	D	7	J	2	7	4
ZYVNYD	D	7	J	2	7	4
ZZWCN4	D	7	J	2	7	4

Response Summary							Participants: 302
	<u>Character 1</u>	<u>Character 2</u>	<u>Character 3</u>	<u>Character 4</u>	<u>Character 5</u>	<u>Character 6</u>	
Consensus	D	7	J	2	7	4	
Number	280	284	265	283	286	286	
Percent	92.7%	94.0%	87.7%	93.7%	94.7%	94.7%	

Conclusions

TABLE 2

WebCode	Conclusions
26JQKN	The obliterated serial number on the bar (Item 1) was mechanically and chemically processed and restored to read D7J274.
27EALP	The obliterated serial number on zinc bar Item 1, was restored to read: D7J274
2ACVB8	Examination of Item 1 revealed an obliterated area on one side. Standard chemical restoration techniques revealed the following characters: D7J274.
2B8DD9	After application of the electro-acid etching process, I determined the serial number of the bar stock as D7J274.
2BNLMW	Using a combination of mechanical and chemical restoration techniques, the serial number was fully restored to read: D7J274.
2CJ4NX	Examination of the submitted bar stock revealed the serial number to have been obliterated. Physical and chemical restoration attempts were unsuccessful.
2NTQPH	Attempts to restore the obliterated serial number on the piece of zinc bar stock, Item 1, were successful. The restored serial number is D7J274.
2P7FRV	The obliterated number on Item 1 was examined microscopically, cleaned and chemically restored to read D7J274.
2QJRWR	Serial number restoration techniques were applied to the submitted zinc bar (Item 1). The serial number was determined to be D 7 J 2 7 4.
2QXCGP	The obliterated serial number on Item 1 was chemically processed and restored to read "D7J274".
2QZ9ME	Examination and chemical processing of item 1 restored the original serial number, which was determined to be "D7J274".
2WKBKH	The obliterated serial number was restored to read D7J274.
2XW2XT	Using standard laboratory techniques, the serial number on Item #1 was restored to read "D 7 J 2 7 4".
2ZQHH3	A series of characters were restored using a Forensic procedure. The restored characters were similar in height, font and stylisation when compared to the supplied "standard".
32BX2A	The restoration of the area presenting alteration was done and it was possible to achieve the complete restoration where the alphanumeric sequence 07J274 was observed.
33R6BX	Standard serial number restoration techniques revealed the following characters: D7J274.
34923X	Physical and chemical processing restored the original obliterated serial number to read "D7J274".
3836JH	SERIAL NUMBER FULLY RESTORED ON 3/25/16 TO READ D7J274
3B64WW	Using chemical etchants the obliterated number on the Item 1 bar stock was restored to read D7J274.
3BZQBL	Using chemical etching techniques, the serial number was restored to read D7J274.

TABLE 2

WebCode	Conclusions
3D6C27	Examination of Item 1 revealed an obliterated area. Standard chemical restoration procedures were utilized and characters "D7J274" were restored.
3MUZXU	Item 1 was microscopically examined. The obliterated number on the Item 1 piece of bar stock was polished and chemically restored to reveal the serial number D7J274.
3NPHZV	Using standard laboratory serial number restoration techniques, an attempt was made to restore the serial number with the following results: Serial Number: D 7 J 2 7 4 was restored on Item 1.
3PK7EK	THE SERIAL NUMBER PRINTED ON THE PRINCIPAL PROOF ITEM OR PHYSICAL EVIDENCE IN MATTER (ZINC BAR STOCK) IS D7J274 THAT WERE OBTAINED THROUGH THE RESTORING PROCESS OF THE SERIAL NUMBER; THE PRINCIPAL PROOF ÍTEM OR PHYSICAL EVIDENCE BELONGS TO THE TEST RESEARCH CTS N° 16-5250. SEE PHOTOGRAPHIC ANNEX.
3QFPFL	The restoration techniques applied allowed the identification of the previously deleted serial number "D7J274"
3RTGBN	The obliterated serial number was restored to read: "D7J274".
3UD7U2	Application of scientific techniques for the retrieval of the manufacturer's originally applied serial number revealed it to be D7J274.
3ZJYPW	The serial number had been obliterated from the metal bar stock. Serial number restoration technique via acid etching yielded the serial number of D7J274.
438NVV	Item 1 was a 0.175 inch thick piece of zinc bar stock, measuring 2.300 by 0.954 inches, with a milled out area on one face. This area was cleaned, polished, and chemically etched in an attempt to restore the obliterated serial number. A serial number of D7J274 was successfully restored.
477ZQV	The serial number was restored to read D7J274.
482HTW	The serial number was restored to read D7J274.
4GK94M	The serial number of the "zinc bar stock" was restored to read D 7 J 2 7 4. The "Aluminum Standard" was not further examined.
4LE34A	The serial number of the zinc bar stock, described in Item 1, was restored and corresponds to: D7J274.
4R2QYE	Item 1 obliterated serial number located in the center of the sample was fully restored after examination and chemical processing. The serial number was determined to be "D7J274".
4TFF2R	Serial Number restoration techniques were applied to Item 1. The Serial Number was determined to be D7J274.
4TG2TD	Serial number restoration procedures were performed on the Item 1 bar stock and the obliterated serial number was restored to read D7J274.
4UVG6U	Using standard serial number restoration techniques, the serial number on CTS item 1 (item 2-1-1) was restored to read: D7J274
4WDWEL	The attempts of restauration of markings are negatives [sic]
4XR3XH	The zinc bar stock (item#1) was chemically processed. Its serial number was restored to read: D7J274

TABLE 2

WebCode	Conclusions
672RCF	The obliterated area on the piece of zinc bar stock in item 1 was chemically etched and the serial number was determined to be D7J274.
6DFXMD	[No Conclusions Reported.]
6DYT6E	After application of the electro-acid etching process I determined the serial number of the zinc bar stock as D7J274.
6EYJLV	Item: 1 One piece of bar stock described as "a piece of zinc bar stock with suspected obliterated serial number". RESULTS: 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 D 7 J 2 7 4.
6HCJJM	The obliterated serial number has been restored as D7J274.
6KKLGE	The primary meaning of the obliterated serial number, most probably, was D7J274
6N3UTK	The work on the milled serial number[sic] of the bar identified as "item 1" has given the following result: D7J274
6RNJDX	Efforts to restore the defaced serial number produced the characters "D7J274". This should be considered the complete serial number.
6TVVUY	Item 1, a piece of zinc bar stock with suspected obliterated serial number was examined within the Firearms Section of the Lab. The suspected area of obliteration was subjected to a series of chemical etchings and the obliterated serial number was fully restored to read: D7J274.
6XBJEW	Following a chemical restoration process, I restored the serial number on the Zinc Bar Stock to be "D7J274"
78VZW6	3. On 2016-03-10 during the performance of my official duties I received a sealed evidence bag with number PA6002256159 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) section of zinc bar with an erased serial number marked by me "70842/16 A". 3.2 One (1) section of an aluminium bar with reference characters (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 obliterated alpha-numeric figures on metals. 5. I examined the exhibit mentioned in paragraph 3.1 and after application of the electro-acid etching process and comparison with the reference sample mentioned in paragraph 3.2 I determined the serial number on the zinc bar mentioned as D7J274.
7WCH7J	The obliterated serial number on the piece of metal (Exhibit 01) was mechanically and chemically treated and restored to read D7J274.
7WPCHD	Using standard restoration techniques, the obliterated serial number on item 1 was unable to be restored.
7YFDPM	Serial number restoration techniques were applied to item 1 (piece of zinc bar stock). The serial number was determined to be D 7 J 2 7 4.
86Y4M2	Item 001 was examined and found to have an obliterated area. Standard chemical restoration techniques revealed the following characters: "D7J274".
88QYAA	Based on the above examination and findings, I am of my opinion that the original serial number on a piece of zinc bar stock "Item 1" is "D7J274".

TABLE 2

WebCode	Conclusions
8ATXMN	Using standard laboratory techniques, the serial number on Item #1 was restored to read: D 7 J 2 7 4
8DEM6F	Laboratory examination of the above described piece of evidence reveals the following numbers and or letters to be present D73274.
8GC4GA	The restored serial number was D,7,J,2,7,4.
8XYGXM	The Item 1 zinc bar stock was physically and chemically processed in an attempt to restore the obliterated serial number with the following result: The serial number was partially restored to read D7*274 where the asterisk could be either an 8, 9 or 0. The serial number was not searched in any databases.
92WHBP	An area of obliteration was observed through the center of Item #1 (zinc bar) having characteristics consistent with those produced by an end mill type tool. Serial number restoration was successful. The serial number on Item #1 (zinc bar) was recovered as: D70274
94H7TG	AFTER CHEMICAL PROCESS, THE SERIAL NUMBER REVEALED IS D7J274
96T7RW	Item 1-1 one metal-like bar: Visual examination of this item revealed the presence of grind/polish marks on the bar on one side. This area was etched with acid solutions and the following was restored: D 7 J 2 7 4
97A3JV	The Item #1 Bar Stock was physically and chemically processed. Its serial number was restored to read: D7J274.
97NPTX	From Proficiency Test #16-5250: Item 1: One (1) Zinc Bar Stock with the middle area containing suspected serial number obliterated. Results: Restored serial number for item 1 appears to be : D7J274. Results were verified. Item 1 will be maintained in the firearms evidence storage area along with other completed proficiency tests. I hereby certify that this is a report of the conclusions of an examination performed by me.
99XRPU	Item # 1 was processed using standard serial number restoration techniques and the serial number was restored to read: D7J274
9E3B6M	After use of our standard procedures for obliterated serial number restoration we found the following number (left to right): D7J274
9EKJTG	The obliterated serial number was restored and concluded to most likely be D7J274.
9FY4LR	The serial number was restored to read "D7J274".
9K4Y98	Revealed[sic] 6 (six) graphic characters removed from the surface of the element.
9KN9QN	The serial number has been restored successfully and appeared clearly and entirely.
9L3XU2	As received Item 1 appeared to have the stamped serial number obliterated. Mechanical & chemical processing was applied and it is the opinion of the examiner that the following characters were developed: D7**74 where the *'s were developed characters however were not discernible enough to determine exactly what they were.
9MVQPK	The obliterated serial number of Item #1 was restored and found to be D7J274.
9N8HJM	Using standard laboratory techniques, the serial number on Item 1 was restored to D7J274.

TABLE 2

WebCode	Conclusions
9Q3Y6W	Forensic restoration techniques applied to the machined area of the item restored six previously stamped characters that read: D7J274.
9QBD4P	Examination of Item 1 revealed one (1) portion of metal bar stock with obliterated serial number. Using standard laboratory restoration techniques, an attempt was made to restore the serial number on Item 1 with the following results: Serial Number: D 7 J 2 7 4 was restored on Item 1.
9T3CF3	After application of the electro-acid etching process I could not determine the serial number of the zinc bar stock marked 68097/16A.
9XYRDQ	The obliterated serial number was restored to read D7J274.
9Y76NC	Upon electrochemical treatment on the field surface, the original number was restored and read as D7J274
A73MD9	Upon electrochemical treatment on the filed surface, the number D7J274 was restored. Based on my findings, I am of the opinion that D7J274 was the original number stamped on the surface that was subsequently obliterated.
A8ZNN7	I am unable to determine the serial number.
AA4JAV	Restoration procedures on exhibit SNR1 revealed the serial number to be: D 7 J 2 7 4
ACA28Q	Exhibit 1 (Item 1) - One piece of Zinc bar with an obliterated serial number. The serial number was chemically restored to be: D7J274.
ADMNRQ	The Item #1 metal alloy bar displayed an apparent area of obliteration as received. The serial number was restored and found to be D7J274. The metal alloy bar with the stampings was not examined.
AEYADL	Restoration of obliterated stamped markings was performed on the questioned surface of Item 1 and the original serial number was found to be "D7J274".
AJDY2N	I restored the serial number for item 1 to D7J274.
AJM3G9	Using standard laboratory restoration techniques, the obliterated serial number was restored to read: D 7 J 2 7 4
AJRJE7	The above number was obliterated through mechanically[sic] obliteration of metal surface from the serial number field.
ALYRUH	Serial number restoration techniques were applied to the submitted zinc bar stock (item #1). The serial number was determined to be D7J274.
AVGH79	The bar received is not that of a zinc, it looks like an aluminium. The number (serial) was never punched or it was removed during obliteration. [From Table 1 - Recovered Characters: "NOT FOUND"]
AXBZT4	The following serial number: D7J274 was recovered and read out as the result of examination of the item designated as Item 1. Decoded alphanumeric characters were compared with the characters located on sample designated as standard. The standard sample was made of aluminium, whereas Item 1 was paramagnetic.
B284XV	The obliterated serial number, located in the middle of the zinc bar stock nearest to the right side, was chemically processed. Attempts to restore the obliterated serial number were successful. The restored serial number is "D7J274". The serial number was verified by [Analyst] of the [Laboratory].

TABLE 2

WebCode	Conclusions
B4ELVR	Defaced serial number was chemically restored to "D7J274".
B67GKL	Standard laboratory techniques for restoring effaced markings in metal have been employed on the inset portion of the zinc bar stock. The serial number was restored and observed to be D 7 J 2 7 4.
BAHHP	Serial Number Restoration Analysis: Methodology - Chemical reagent Etching / Microscopy / Physical. Serial number restoration procedures revealed the serial number on Item 1, the zinc bar stock, to be: D7J274.
BHFXRQ	Using standard laboratory restoration techniques, the obliterated serial number on Item #1 was restored to read D7J274.
BWCAZU	The obliterated serial number on the piece of bar stock (Item 01), was chemically restored and determined to be "D7J274".
BWXQFX	Visual examination and chemical treatment of the serial number area on the bar stock, Item 1A, reveal the following number: D7J274. Item 1B was inspected to verify and document contents. No analysis was performed on the item listed.
BZCKVU	The serial number of Item 1 was restored to read D7J274.
C4T88E	Examination and restoration of the obliterated area on Item 1 (a piece of zinc bar stock with suspected obliterated serial number) revealed the following characters interpreted as "D7J274".
C4VPEP	A piece of metal was received at the laboratory that had a ground area on one side. Number restoration was attempted on this area using chemical etching methods. The following characters were recovered: "D 7 J 2 7 4"
C6Q9FR	Serial Number Restoration Analysis: Methodology - Chemical Reagent Etching / Microscopy / Physical. Serial Number restoration procedures revealed the serial number on Item 1, the Zinc bar stock, to be: D7J274.
CAGUZY	3. On 2016-03-08 during the performance of my official duties I received a sealed evidence bag with number PA6002256160 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) sealed envelope marked "Test No. 16-5250: SERIAL NUMBER RESTORATION", containing the following: 3.1.1 One (1) envelope marked "Test No. 16-5250 Item 1 ZINC BAR STOCK", containing the following exhibit: 3.1.1.1 One (1) piece of metal marked by me "70828/16A". 3.1.2 One (1) envelope marked "Aluminum Standard Test No. 16-5250", containing the following: 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-acid etching process, I determined the number on the piece of metal mentioned in paragraph 3.1.1.1 as D7J274.
CAV438	The serial No.area of the piece of zinc bar was prepared and chemically processed with restoration reagents. As a result of these actions the serial No. was restored to read D7J274
CCKPJ2	The serial number was fully restored to read "D7J274".
CGG7YG	One (1) piece of zinc bar stock (approx 2 1/4" x 1") submitted with a suspected obliterated serial number. A 1 1/4" x 1" rectangular area of surface was removed by grinding. Serial number "D7J274" restored using chemical etching process. Bar stock was scribed with "CTS 16-5250" examiner.
CNGTNV	Visual examination and chemical treatment of the serial number area on the zinc bar stock, Item 1A, reveal the following number: D7J274.

TABLE 2

WebCode	Conclusions
CYJQW6	The serial number of Item 1 was restored and read as D7J274
CZPHF6	The obliterated serial number located on the center portion of the zinc bar stock was chemically processed and restored to read "D7J274".
D8MK7N	Using standard laboratory techniques, the obliterated serial number on Item 1 was restored to read "D7J274."
DDABPX	After application of the etching process, I determined the serial number on the zink[sic] bar stock as D7J274.
DFFTQE	The item is a zinc bar stock with suspected obliterated serial number. Laboratory chemical restoration procedures revealed the following serial number: D7J274.
DGXMRN	Using standard laboratory restoration techniques, the obliterated serial number on Item 1 was restored to read D 7 J 2 7 4.
DHNT8E	The serial number has been restored to read: D7J274.
DRF6JV	Attempts to restore the serial number were unsuccessful.
DTLUKJ	The serial number of the metal plate was restored and determined to be D7J274.
DVV2MC	Serial number restoration was preformed[sic] on item 1.1. The serial number D7J274 was restored.
E2WBVP	The Item #1 was physically and chemically processed. Its serial number was restored to read D7J274.
E6Y96W	After application of the etching process, I determined the serial NR on the zinc stock bar as D7J274.
E77NDN	The serial number was chemically processed and restored to read D7J274
E7QG4Z	The serial number of the zinc bar stock, Item SNR1, was determined to be D7J274.
E9WUUE	Chemicals[sic] solutions were applied to the altered serial number. The following number has been revealed : D7J274. See attached picture. [Picture is unable to be included in this report.]
EHZ63P	Examination and processing of the Q-1 bar stock restored the original obliterated serial number, which was determined to be D7J274.
EJTX9	THE METAL PIECE RECEIVED FOR RESTORATION OF SERIAL NUMBERS WAS REVELATED BY THE CHEMICAL REVALING METHOD (FRY); THE SERIAL NUMBER REVELATED WAS D7J274.
EJYBJJ	The obliterated serial number on the Item 1 zinc plate was restored to read D7J274.
EP43WM	The serial number was successfully restored.
EQU347	1. The obliterated area on Exhibit 1 (piece of zinc bar stock) was visually examined, polished, and chemically processed. The characters were restored and appeared as follows: D7J274.
ERB8L6	After preparation and treatment of the serial number area of Item 1, no clearly identifiable serial number was developed.
ERPVPH	Standard laboratory techniques for the restoration of effaced stampings in metal were employed on the Exhibit 1 zinc bar stock. The serial number was restored to read D 7 J 2 7 4.

TABLE 2

WebCode	Conclusions
EUFYDH	Using standard serial number restoration techniques, the obliterated serial number on item 1-1-1 was restored to read: D7J274.
F33DUT	Standard restoration techniques were applied to Item 1. The following characters were restored: D7J274.
F4JCCX	In the piece of metal was restored the alphanumeric sequence D7J274
F8VGLC	The Exhibit # Item 1 obliterated serial number was restored to read "D7J274".
F9QZMD	ITEM 1: ONE PIECE OF ZINC BAR STOCK WITH A SUSPECTED OBLITERATED SERIAL NUMBER, MARKED K1. Q1 SERIAL NUMBER "D7J274" WAS FULLY RESTORED USING POLISHING AND ACID ETCHING SOLUTIONS.
F9TPUW	After application of the electro acid etching process, I determined the serial number of the exhibit mentioned in 3.1 as D7J274.
FM9WK2	The serial number of Item 1 was restored using chemical etching techniques and was found to be: D7J274.
FR6CHP	Exhibit 1 has an area of obliteration in the center of the zinc bar stock. The obliteration appears to be accomplished by milling and the resulting toolmarks are suitable for identification. The area on the zinc bar stock was chemically processed and the serial number was fully restored to read D7J274.
FTX96X	The serial number of the zinc bar stock, described in the item 1, was restored and corresponds to: D7J274.
FV4TTX	The obliterated serial number was fully restored to read "D7J274".
FYLT9D	I found filing marks on the metal plate Item 1. Upon electrochemical treatment on the filed surface, the number 'D73274' was restored. Therefore, I am of the opinion that the obliterated serial number is D73274.
G7GCPZ	The grinded surface on the zinc bar stock was electrochemically treated and a set of alphanumeric was restored and read as "D7J274"
G88KP3	After application of the electro-acid etching process, I determined the serial number of the exhibit possibly as D7J274.
GA4PQQ	The "Item 1" obliterated serial number, located to the right/center of the zinc bar, was chemically processed and partially restored to read " * 7 * 2 7 4 ", where the first asterisk most likely represents a "0" but a "D" could not be eliminated, and the second asterisk most likely represents a "0" but a "J" or a "9" could not be eliminated.
GBXHLA	Using chemical etching techniques the serial number was restored to read D7J274. The aluminum standard was not further examined.
GCAAGC	Serial number restoration techniques were applied to Item 1 (bar stock). The serial number was determined to be D7J274.
GF7XVX	he[sic] serial number "D7J274" was recovered from the piece of zinc bar stock, identified Item 1.
GG8LKN	The metal pad displayed grind marks where the serial number is usually stamped. I chemically restored the digits D7J274 which appears to be consistent with the supplied reference sample digits.

TABLE 2

WebCode	Conclusions
GJAW7Q	Visual examination and chemical treatment of the serial number area on the bar stock, Item 1, fail to reveal the original serial number.
GLDFEK	Serial number restoration analysis: Serial number procedures revealed the serial number on Item SNR1A, the Zinc bar to be: D7J274. Methodology: chemical reagent etching / microscopy / physical.
GUMWZY	THE BAR HAS BEEN GRINDED. AFTER THE ANALYSIS WAS DONE ON THE GRINDED SURFACE, THE NUMBER WAS RESTORED AND READ AS D7?274 (WHERE "?" REPRESENT THE NUMBER OR ALPHABET THAT CANNOT BE IDENTIFIED DUE TO INTENSIVE GRINDING).
GVZPED	Examination and chemical processing of the obliterated serial number in Item #1 restored the following sequence: "D 7 J 2 7 4". Item #2 was for reference purposes only.
GWW7QB	The serial number was restored to read D7J274.
GWYJMJ	Physical and chemical processing of the submitted bar stock restored the obliterated, original serial number to read "D7J274".
H24RGT	3. On 2016-3-10 during the performance of my official duties I received a sealed evidence bag with number PA6002256149 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) inner CTS-Evidence sealed brown envelope, containing the following: 3.1.1 One (1) brown tape-sealed envelope, marked "Aluminum Standard" and "Test No. 16-5250", containing the following item: 3.1.1.1 One (1) Aluminum bar stock intended as a Standard, with the figures "1" to "9" and "0" and the letters, "A" to "F", "H", "J", "K" and "N" there on, marked by me with "76121/16 Al.St". 3.2.1 One (1) brown tape-sealed envelope, marked Test No. 16-5250" and "Item 1", containing the following exhibit: 3.2.1.1 One (1) piece of zinc bar stock, marked by me with "76121/16 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 the application of the electro-acid process on the exhibit as mentioned in paragraph 3.2.1.1, I determined the obliterated alpha-numeric figures as D70274.
H7CC36	THE ZINC BAR STOCK RECEIVED FOR RESTORATION OF SERIAL NUMBERS, WAS REVEALED BY THE CHEMICAL REVELAING[sic] METHOD (PALMERTON); THE SERIAL NUMBER REVEALED WAS D7J274.
H8BHJY	On the examination, I found that there were filing mark on the surface of the zinc bar stock and no numbers were observed. On electrochemical treatment, a set of number "D7J274" was restored. Hence, I am of the opinion that the numbers of the zinc bar stock were tempered and the original number numbers[sic] were "D7J274".
HC7ATG	The obliterated serial number on the zinc bar, Item 1, was restored to D7J274.
HX6B7K	Using standard laboratory restoration techniques the obliterated serial number on Item 1 was restored to read: D7J274
J46GW8	The obliterated six alphanumeric characters on the zinc bar stock were restored as followed: D 7 J 2 7 4
J4M4UN	The obliterated area on Exhibit 001 (metal bar stock) was visually examined, polished, and chemically processed. The characters were restored and appeared as follows: D 7 J 2 7 4.
J6ZZX9	The serial number was restored to read "D7J274".
J7FAYL	The zinc bar stock had an area of material removed using a mill type tool. The milled area was treated with a 10% nitric acid solution and the following characters were restored: D7J274.

TABLE 2

WebCode	Conclusions
JEL2F4	The serial number on the piece of zinc bar stock was restored to read D7J274.
JEQCKM	The area of metal was chemically examined and the characters D7**74 were recovered. The '?' represents an unknown character. Fragments of these characters were recovered, however were of insufficient clarity for a positive identification.
JGQNV	The serial number observed on the zinc bar was D7?274, the symbol [sic] "?" is a character that was not possible to restore
JKEZWJ	The serial number was chemically processed and restored to read "D7J274".
JKZQT	The restoration of the metal piece was realized and was achieved to reveal the alphanumeric sequence D7J274
JLLHTU	The recovered number was found D7J274, in accordance with aluminium pattern.
JNECRJ	The serial number was chemically restored to D7J274.
JP7B4W	Attempts to restore the serial number on item #1 with polishing and chemical processing successfully restored the serial number to read, "D7J274".
JRXGBF	Results: The restored serial number was: D73274. *Note: It is the responsibility of the case agent to research the restored serial number and enter the restored serial number in the Property Evidence Tracking System (P.E.T.S).
JT99GB	One (1) block of silver non ferrous metal measuring approximately 2 1/4" x 7/8" x 1/8" displaying a 1 1/4" x 1" area milled away - serial number D7J274 recovered with chemical etching. Item marked 16-5250 for identification.
JYWTKQ	The submitted piece of zinc barstock, with a suspected obliterated - serial number was examined. An attempt was made to recover the serial no. The serial no. D7J274 was recovered.
K3K6MZ	THE SERIAL NUMBER HAD BEEN ERASED; HOWEVER I RESTORED IT BY MEANS OF CHEMICAL ETCHING. THE SERIAL NUMBER WAS D7J274.
K4KTEC	Item 1 is a piece of stainless steel colored metal bearing an obliterated area which was restored to read D7J274. The serial number in Item 1 was restored using polishing tools and various chemical etchants.
K4ZEND	The obliterated serial number on the item 1 piece of zinc bar stock was restored and found to be D7J274.
K7PK44	AFTER PERFORMING THE SERIAL NUMBER RESTORATION TEST OVER THE PROVIDE ZINC BAR THE FOLLOWIN[sic] SERIAL NUMBER WAS RECOVERED: D7J274.
K9V7WB	Standard laboratory procedures for restoring characters stamped in metal have been employed on the recessed area of the submitted bar stock. The serial number was determined to be "D7J274".
KALAKB	Chemical restoration of number on piece of zinc bar start time : 15h00 / finish time 15h15. Number stamped : D7J274
KCV792	After application of the chemical process, I determined the serial number of item SNR1 to be D7J274.
KD8UR2	The firearm, item #1, was chemically processed. Serial number restored to read (D7J274).

TABLE 2

WebCode	Conclusions
KRT9VZ	Examination and chemical processing of Item 1 determined the original obliterated serial number to be D7J274.
KXFWQ7	The defaced serial number on the piece of zinc bar stock (Item 1) was restored to be "D7J274".
KZLGFQ	After application of the electro acid etching process, I could not determine the alpha numeric figures on the zinc bar (mentioned in 3.1 of statement).
L36WLC	The serial number of Item 1 was mechanically and chemically processed and restored to read "D7J274".
L4HKM4	The serial number on Item 1 has beenobliterated[sic] by a milling process. Our attempt to restore this numbre[sic] was successful, revealing the following characters : D 7 J 2 7 4
LG4ZQ4	The serial number on the piece of metal (Exhibit 1) was obliterated through the middle of the numbers as submitted. The obliterated serial number was mechanically and chemically restored on the piece of metal (Exhibit 1) to be D7J274.
LGNLG9	ONE (1) ZINC BAR STOCK WAS RECEIVED WITH AN OBLITERATED SERIAL NUMBER. SERIAL NUMBER OF D7J274 FULLY RESTORED BY POLISHING AND CHEMICAL MEANS.
LGPBMQ	After application of the electro-acid etching process I determined the serial of the item 1 as D7J274.
LHVXXA	The obliterated serial number of Item 1 was restored to be D7J274.
LJQGZB	Item 1: The serial number was restored to read D7J274.
LN3JQD	The serial number had been obliterated from the Zinc bar and was restored with light sanding and chemical etching to yield the serial number D7J274.
LQD8M7	The serial number was restored to read: D 7 J 2 7 4. The aluminum bar stock was not further examined.
LV4JLA	The obliterated serial number on the section of zinc bar stock in Item #1 was completely restored and found to be D 7 J 2 7 4.
LV92K8	The obliterated serial number of the Item #1 zinc bar stock was chemically restored to read D7J274.
LVJZG3	THE IDENTIFICATION NUMBER OF THE PLATE CORRESPONDING TO TEST N° 16-5250 ITEM 1 (ZINC BAR STOCK) REVEALED THE FOLLOWING ALPHANUMERIC CHARACTERS "D7J274" BEING DETERMINED TO MATCH THE TYPE OF MARKING STAMPED ON THE PLATE IDENTIFIED AS ALUMINUM STANDARD TEST N° 16-5250
LVPC3D	The obliterated serial number on the zinc bar stock, item 1, was restored to D7J274. The zinc bar stock, item 1, was examined noting that the location of the suspected serial number was obliterated by a grinding type of tool. Using standard restoration techniques, the area was sanded and treated with chemicals.
M4TPUZ	The above procedeu[sic] revealed the following alphanumeric characters "D7J274" corresponding to the identification number of the metal plate described in the EMP 1 ID (item 1), these match the dialing mode used by the manufacturer Collaborative Testing Services.
M4Y2FC	The chemically enhanced serial number on item 1 is D7J274.

TABLE 2

WebCode	Conclusions
M6P8W3	The zinc metal bar stock (1) was physically and chemically processed. Its serial number was fully restored to read: D7J274 on 04/05/2016.
M73WYE	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 "D7J274".
M8UVBR	The piece of metal has surface wear by chemical restoration the original sequence (D7J274) was restored, which corresponds to the pattern characters used as comparators.
MD7UTC	1. Exhibit 1 is a zinc bar stock with an obliterated serial number. 2. Mechanical and Chemical processing of Exhibit 1 revealed that the original serial number is D 7 J 2 7 4.
MGHQB8	The examination and processing of the obliterated serial number on the Item 1 piece of bar stock was restored to read "D7J274".
MMNK64	THE ITEM 1 OBLITERATED SERIAL NUMBER, LOCATED ON THE FRONT MIDDLE OF THE ZINC BAR STOCK WAS POLISHED USING THE DREMEL AND CHEMICALLY PROCESSED AND RESTORED TO READ D7J274.
MRK49M	After application of the electro-acid etching process, I dermined[sic] the serial number of the bar stock as D7J274.
MU9FAD	One side of Exhibit 1 has a portion where they[sic] metal appears to have been removed using a milling machine. This area was polished and chemically processed. The serial number D 7 J 2 7 4 was restored on Exhibit 1.
MVZCY8	Serial number on MBI (metal block) was removed (deeply abraded). The serial number was restored using the chemical etching process. CTS number etched on MBI for identification.
MWYLQ4	THE SUBMITTED BAR STOCK WITH THE OBLITERATED SERIAL NUMBER WAS MARKED Q1 FOR IDENTIFICATION. Q1 WAS POLISHED AND CHEMICALLY PROCESSED. THE SERIAL NUMBER RESTORATION REVEALED THE FOLLOWING D 7 J 2 7 4.
MZYPKC	The serial number of Item 1 as restored is D7J274.
N6MWFP	The serial number of the zinc bar stock described in the item 1, was restored and corresponds to: D7J274.
N7HFGQ	Alphanumeric sequence "D7J274" was restored in the disturbed area of the object identified as "item 1"
NF84EE	Item 1 is a piece of zinc bar stock with an obliterated serial number. Using standard serial number techniques, the serial number on Item 1 was restored to read: D 7 J 2 7 4.
NFJZJJ	Visual examination and chemical treatment of the serial number area on the zinc bar stock, Item 1, reveal the following number: D7J274
NMGRQR	The suspected obliterated serial number was restored and found to consist of the following six (6) characters D 7 J 2 7 4.
NQ64RH	Serial number restoration was conducted on item 1, the Zinc bar stock, using acid etching chemical processing techniques. The following characters were revealed: *7*274. The first * was not clear. It appeared to be "D", but could be also "0" (zero). The second * was not clear. It appeared to be a "0"(zero) or "8", but could also be another character.

TABLE 2

WebCode	Conclusions
NRW34V	Attempts to restore the obliterated serial number of Item 1 were successful. The restored serial number is D7J274.
NTUDYY	The obliterated area on the piece of zinc bar stock in item 1 was chemically etched and the serial number was determined to be D7J274.
NWTRK3	Using chemical etching techniques the serial number was restored to read D7J274.
NX7GP2	The serial number on the piece of metal (Exhibit 01) was mechanically and chemically treated and restored to read D7J274.
PAF8BA	The obliterated area was partially restored to reveal a six character serial number. The third character appeared to be a "J" but a "0" could not be ruled out. Consequently the possible serial number combinations are, "D7J274" and "D70274".
PGC969	The serial number of Item 1 was mechanically and chemically processed and restored to read "D7J274". This conclusion was verified by Firearms Examiner___.
PJXXMZ	In the piece of zinc BAR STOCK with suspected obliterated erial[sic] number, that comes identified as " test N° 16-5250" item 1. Submitted to the procedeuure of developing serial number, the following alphanumeric characters was obtained D73274.
PL4HDK	After application of the electro-acid etch process I determined the serial number on the zinc bar stock mentioned in paragraph 3.1 as containing six (6) alpha - numeric characters and is recorded as D7J274.
PP8ZPV	The numbers were unable to be restored.
PWLY6R	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 "D7?274" where ? is the undermined alphabet / number due to intensed filled on the metal surface area. Hence, I am of the opinion that the number of the steel bar was tempered and the original number was D7?274.
PZKB4D	Examination and processing of the Q-1 bar stock restored the original obliterated serial number which was determined to be D7J274.
Q2A4B2	The serial number was restored to read D70274.
Q7TYET	The obliterated serial number was restored to read D7J274
Q9XLV4	The Exhibit's surface was lightly polished, using grinding paper 600. The polished surface was then treated with HF based solution. The restored serial number is D7j274. The results were successfully photographed.
QA9NH3	Serial number restored using chemical etching process with the following results: "D7J274" FIU # scribed on evidence by examer[sic] for identification purposes.
QAT6X7	Standard laboratory procedures for restoring serial numbers stamped in metal have been employed on the cut out of this piece of metal. The serial number was restored to : D7J274.
QD9ZD3	Serial number obliterated by abrasion. Serial number restored by chemical etching and reads "D7J274".
QLYKGF	Examination and chemical processing of the zinc bar failed to restore a complete serial number restoration.

TABLE 2

WebCode	Conclusions
QRPVRE	THE OBLITERATED SERIAL NUMBER WAS RESTORED TO READ "D7J274".
QUE4YU	Item (1) was physically / chemically processed. It's serial number was restored to read (D7J274).
QY82Q7	Standard laboratory techniques for the restoration of effaced stampings in metal were employed on the section of zinc alloy Exhibit 1. The serial number was restored to read: D 7 J 2 7 4.
R6TFRH	3. On 2016-03-30 during the performance of my official duties I received a sealed evidence bag with number PA6002256158 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) 57mm x 23mm piece of Zink[sic] bar of which the serial number is erased, marked by me "78729/16 A". 3.2 One (1) 50mm x 38mm piece of Aluminium bar sample set with punched numbers as follows: "A" to "N" and also "0" to "9" respectively, marked by me "78729/16 B". 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-acid etching processes I determine the serial number of the piece of Zink[sic] bar mentioned in paragraph 3.1 as D7J274.
RD7CU4	Restoration of the obliterated serial number was performed on the questioned surface of the zinc bar stock marked "Item 1". The restored serial number was found to have six characters - "D7J274".
RDLTPW	Item (1) was physically / chemically processed. It's serial number was restored to read: D7J274.
RKPVUW	The obliterated characters on the piece of zinc bar stock (Exhibit 1) were chemically and mechanically treated and were restored to read "D7J274".
RL43FE	Attempts to restore the obliterated serial number on Item 1 were successful. The obliterated serial number was restored to read "D7J274".
RNQRLD	The area of the obliterated number was polished and chemical etchants then applied. This resulted in the digits: D7J274 being restored.
RPG3C7	The serial number on the zinc bar, item SNR1-1, was partially restored to read "07*274". The "*" could be either a "0", "3", "6", "8" or a "J".
RR2QUX	The serial number was removed approximately 0.2 mm thickness. The removed serial number was resulted by the examination: D73274.
RR79TW	The piece of stainless steel bar stock sent to study presents six characters printed as follws[sic]: D7J274 for testing frys.
RZWX6Q	Results of Laboratory Examination: Examination and restoration of the obliterated area on Item 1 revealed the following characters "D7J274".
T6PDDX	Using chemical etching techniques, the serial number was restored to read D 7 J 2 7 4.
TC8L4F	Item #1 was received with an obliterated serial number. Chemical etchants were applied to the obliterated area. The characteristics were restored to read D7?274, where "?" is likely a J or 0.
TKZ48P	After application of electro-acid etching process, I could not determine the serial number on zinc bar stock. [From Table 1 - Recovered Characters: "Not found."]
TQ7MH2	The serial number on item 1A was restored to read D7J274

TABLE 2

WebCode	Conclusions
TXN2G2	THE ZINC BAR STOCK (ITEM 1) WAS MARKED Q1, [Name], [Participant Code] TO THE LEFT OF THE SUSPECTED 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 PARTIALLY RESTORED TO READ AS FOLLOWS: ???274.
TXQQNJ	After application of the electro etching process, I determined the serial number on the zinc bar stock as D7J274.
U2YFFQ	The submitted sample is a piece of zinc bar stock with a milled down area on one side. The sample was sanded down in the milled area, using grit size 800 sanding paper until an even surface was achieved and then etched using Fry's solution. The obliterated serial number was restored with this method and was clearly visible.
U8BEXC	The serial number is milled off. The serial number (D7J274) was restored by acid etching. The modified Fry's Reagent and the Nickels & Alloy's Reagent were used.
UDWAYF	I have applied electro-acid etching method, I determined the serial number of the item (1) as D7J274.
UJ34VW	The serial number on the piece of metal (Exhibit 2) was mechanically and chemically treated and restored to read D7J274.
UP7YQP	After the application of the electro-magnetic etching process, I could not recover the serial number of the exhibit mentioned in 3.1 (marked 74618/16 A).
UVWA2N	Using standard laboratory restoration techniques, the serial number on Item 001A was restored to read D7J274.
UYWKWN	Using standard laboratory restoration techniques, the serial number on the piece of aluminum in item 001A was restored to read D7J274. The piece of aluminum in item 001B was submitted for continuity.
UZNR37	Visual examination and mechanical and chemical processing of the piece of bar stock (Item 1) revealed the serial number to be D7J274.
V62RZX	Characters "D7J274" restored by chemical etching.
VE976K	I found the serial number to have been obliterated by filing. On electrochemical treatment, I developed the number D7J274. I am of the opinion that the original serial number was D7J274.
VJZQV8	The acid etch method was used to completely restore the serial number of the 0001-AA (Item 1) Zinc bar stock to read: D7J274. No testing was conducted on or with the 0001-AB Aluminum standard.
VM3CZ8	Using standard laboratory restoration techniques, the obliterated serial number on Item 1 was partially restored to read D7*274, where * designates a non-recovered character.
VP6ABZ	The obliterated serial number on Item 1 was restored and interpreted as "D7J274".
VRA33D	The obliterated serial number on the Item 1 bar stock was restored to read: D7J274.
VYBGNE	After application of the electro acid etching process with green mamba acid I determined the serial number of the exhibit (zinc bar stock) item 1 as D7J274.
VZ68UT	The obliterated surface on the Zinc bar stock (Item 1) was sanded and chemically processed. All characters could have been seen almost in same time during the examination.

TABLE 2

WebCode	Conclusions
W2F8QM	The obliterated serial number on the zinc bar stock (item 1) was restored to read D7J274.
W4LRF9	The serial number on the piece of zinc bar stock was obliterated by a milling process. No tool marks of value were observed. The obliterated area was polished and chemically processed. The serial number "D7J274" was observed.
W8L3AM	Examination of Item 1 revealed the presence of a defaced area. Item 1 was physically and chemically processed. The serial number was restored as: D7J274
WBJJMG	Chemical treatment was successful in chemically restoring a serial number on the bar. The serial number on the bar was restored to read D 7 J 2 7 4.
WCARLK	The obliterated serial number stamped on Item 1 was chemically processed and restored to read "D7J274."
WD8VN9	#1, the obliterated serial number on the piece of zinc bar stock was unable to be restored.
WFA3HK	1. The obliterated area on Exhibit 1 (metal block) was visually examined, polished and chemically processed. The characters were restored to read: D 7 J 2 7 4.
WGAUYZ	The obliterated number on Item 1 was chemically restored to reveal the serial number D7J274. Supporting examination documentation is maintained in the case file.
WL22EN	Visual examination of the one (1) piece of zinc bar stock, item #1, revealed an obliterated area on its surface. Chemical etching of this area revealed the serial number to be D7J274. The additional submitted one (1) aluminum standard, item #1, was not examined at this time.
WL79U3	A serial number restoration was performed on Laboratory Item 001.A Zinc bar stock. Based upon CTS, the expected serial number configuration for Laboratory Item 001.A Zinc bar stock is six characters. The serial number was fully restored and appeared to be D7J274.
WQWTP7	Examination and processing of the Q-1 bar stock restored the original obliterated serial number, which was determined to be D7J274. A search of the NCIC Stolen Gun Files by the restored Serial Number was not done as this is a proficiency.
WRRBR8	Serial number restoration reveals the number "D7J274".
WTK8DF	After application of the electro acid etching process, I determined the serial number of the exhibit mentioned in item 1 (3.1) as D7J274.
WTMY7W	The Exhibit #1 serial number was restored to read D7J274.
WXJHC2	The obliterated serial number on the metal bar, item 1-1, was restored to read "D7J274".
XA4J3R	The serial number was restored to read: D7J274.
XNM3Z3	Examinations showed the serial number of Item 1 to be obliterated. The serial number of Item 1 was restored through chemical etching techniques and was found to read: D7J274.
XQEYNW	One (1) piece of zinc bar stock (approx 2 1/4" x 1") submitted with a suspected obliterated serial #. Surface of the material is defaced by concentric abrasions. Serial # "D7J274" restored using chemical etching process, scribed with number "16-5250" by examiner for identification.
Y8DM7L	After application of the electro-acid etching process, I could not determine the serial number of the zinc bar stock.

TABLE 2

WebCode	Conclusions
Y96TC4	The serial number is milled off. The serial number (D7J274) was restored by acid etching. The modified Fry's reagent and the Nickels & Alloys reagent were used.
YBWP2X	The section of aluminum bar stock Ex. 1.1 was visually inspected. Standard Laboratory techniques for the restoration of effaced markings in metal were applied to the damaged area of the section of zinc bar stock Ex. 1. The characters appeared to be D 7 J 2 7 4.
YKDLTH	Examination and chemical processing of Item #1 restored the following characters "D7J274".
YKNYU2	Mechanical and chemical processing of the submitted exhibit 1 revealed that the original serial number is D7J274.
YMPC8T	Item 1 was physically, chemically and magnetically processed. Its serial number was restored to read: "D 7 J 2 7 4"
YXBFER	The serial number on the piece of metal (Exhibit 1) was obliterated through the middle of the numbers as submitted. The obliterated serial number was mechanically and chemically restored on the piece of metal (Exhibit 1) to be D7J274.
Z9JKYT	The obliterated serial number of Item #1 was restored to D7J274.
ZAXZG2	Methodology - Chemical Reagent Etching / Microscopy / Physical. Serial number restoration procedures revealed the serial number on Item 1, the bar stock, to be: D7J274.
ZDHU9V	Using standard laboratory techniques, the serial number/identification data on Item 1 was restored to: "D 7 J 2 7 4"
ZE9ZPL	The zinc bar stock (item#1) was chemically processed. Its serial number was fully restored to read D7J274.
ZJMXW9	Examination of Item 1 revealed an obliterated area on one side. Standard chemical restoration techniques revealed the following characters: "D7J274".
ZL47ZE	Test No. 16-5250 Item 1 ZINC BAR STOCK is represented in a paper package. The testing material provided is a piece of zinc bar stock, according to the note on the package. The aim of the test is to restore the deleted serial number. Unfortunately, criminalistics examination department of [Laboratory] doesn't have relevant zinc material processing reagents, which would assist us to complete the serial number restoration. After the examination of the zinc bar stock under the violet rays 395-425nm of "Crime-lite M2", using GG455-AG filter and VSC 6000 / HS ultraviolet rays 365nm, polishing it with emery cloth and processing it with the chemical reagents available to us, the serial number restoration was not possible.
ZX3V4U	Using standardized laboratory techniques, the serial number of bar stock Item 1 was restored to read: D7J274.
ZYVNYD	The serial number of the zinc bar stock described in item 1, was restored and corresponds to: D7J274.
ZZWCN4	A series of previously stamped characters were restored which read: D7J274. The size and font were similar to those used on the aluminium bar stock labelled "standard".

Sample Preparation

(listed in order of use)

TABLE 3

WebCode	Method	Tool Used	Grit Size
26JQKN	Visual	Stereoscope	
	Polishing	Rotary Tool	polishing wheel
27EALP	Polishing	Rotary Tool	
2ACVB8	Visual		
	Polishing	Dremel	fine
2B8DD9	Sanding	Dremel Europe	1 mm
	Polishing		
	Visual		
2BNLMW	Sanding	Dremel Tool & Sandpaper	150 + 320 grit
2CJ4NX	Polishing	Rotary Tool	
2NTQPH	Sanding	Sand paper	Wet/Dry
2P7FRV	Clean & Micro. Exam	Acetone (clean)	
2QJRWR	Polishing	Dremel	
2QXCGP	Buffing/Polishing	Dremel w/ polish wheel	
2QZ9ME	Sanding	Dremel	
2WKBBH	Sanding	Sand paper	280
	Polishing	Sand paper	400
2XW2XT	Polishing	Dremel	
2ZQHH3	Visual	My eyes	
	Cleaning	Prepsol	
	None	Cast surface for file	
	Sanding	Emery paper	1200 grit
	None	M7 V1 - Use posi-test	
32BX2A	Sanding	Sand paper	400, 220 and 80
33R6BX	Grinding	Dremel	
	Polishing	Dremel	
34923X	Grinding	Dremel	
	Polishing	Polishing wheel	
3836JH	Sanding	Sand paper	MED
3B64WW	N/A	N/A	N/A

TABLE 3

WebCode	Method	Tool Used	Grit Size
3BZQBL	Visual	Stereoscope	
	Polishing	Sand paper	150 then 200
	Visual	Stereoscope	
3D6C27	Polishing	Dremel	
3MUZXU	Polishing	Dremel tool	
3NPHZV	None		
3PK7EK	Polishing	Rotary Tool	
	Cleaning	Sand paper	600
3QFPFL	Cleaning	Acetone	
	Sanding	Sand paper	800
	Polishing	Steel wool	
3RTGBN	Visual	magnification goggles	
	Grinding	Dremel	
	Polishing	Dremel	
	Cleaning	methanol	
	Visual	magnification goggles	
3UD7U2	Sanding	Sand paper	120
3ZJYPW	Polishing	Dremel	fine grit
438NVV	Sanding	Emery paper	Medium
	Polishing	Sand paper	600 grit
477ZQV	visual w/ oblique light	Flashlight	
	Polishing	Dremel tool	
482HTW	Polishing	Dremel	
4GK94M	Visual	Stereoscope	
	Visual	digital camera	
	Sanding	Sand paper	400
4LE34A	Visual	Stereoscope	N/A
	Cleaning	Acetone	N/A
	Polishing	Sand paper	P220
	Polishing	Sand paper	1000
4R2QYE	Visual Inspection		
	Sanding	sand paper block	fine
	Polishing/Cleaning	metal surface cleaner	
4TFF2R	Polishing	Dremel	

TABLE 3

WebCode	Method	Tool Used	Grit Size
4TG2TD	Acetone		
	Sanding	Sand paper	fine
4UVG6U	Sanding	Sand paper	fine
	Polishing	Rotary Tool	
4WDWEL	Sanding	Sand paper	400 and 800
	Polishing		
4XR3XH	Sanding	Emery paper	coarse
672RCF	Polishing	Dremel	
6DFXMD	Cleaning		
6DYT6E	Sanding, Polishing, and Visual	Sand paper and the etching machine for preperation (Dremel)	
6EYJLV	Polishing	Dremel	
	Sanding	Steel wool	
	Sanding	Sand paper	320
6HCJJM	Polishing	Emery paper	
6KKLGE	Polishing	Rotary Tool	
6N3UTK	Visual	camera Nikon D90	
	Visual	binocular wild M3Z	
6RNJDX	Visual	Stereoscope	
6TVVUY	Sanding	Sand paper	1500-b waterproof sandpaper
6XBJEW	Polishing	Buffing wheel	
78VZW6	Sanding	Foredom sanding tool	medium 220 grit
	Polishing	Foredom sanding tool	
	Visual	Leica Table Microscope	
7WCH7J	Polishing	Dremel	
	Cleaning	Water	
7WPCHD	Cleaning	Dremel	polishing disc
	Sanding	Sand paper	600
7YFDPM	Cleaning	Acetone	
86Y4M2	Polishing	Dremel	
88QYAA	None		

TABLE 3

WebCode	Method	Tool Used	Grit Size
8ATXMN	Polishing None	Dremel	
8DEM6F	visual photography sand paper acids photograph	eyes camera sand paper Qtips	P220
8GC4GA	Polishing	Emery paper	P100
8XYGXM	Visual Sanding Polishing Polishing	Stereoscope Emery paper Dremel Steel wool	400 0000
92WHBP	Polishing	Dremel	extra fine Cratex wheel and steel wool
94H7TG	Polishing	Sand paper	1200
96T7RW	None		
97A3JV	Polishing	Dremal[sic]	N/A
97NPTX	Visual Sanding	Magnifying Glass Sand paper	150 Grit
99XRPU	Polishing	Dremel	
9E3B6M	Visual	determination kind of metal	
9EKJTG	Visual Polishing	Stereoscope Dremel	
9FY4LR	Polishing	Dremel	
9K4Y98	Visual		
9KN9QN	Polishing and miproacies[sic]	Dremel	1200
9L3XU2	None After 1st application chem polished	Dremel	
9MVQPK	Visual Polishing Cleaning	Stereoscope Dremel Acetone	
9N8HJM	Visual Polishing Sanding	Stereoscope Dremel Sand paper	Fine
9Q3Y6W	Polishing	Emery paper	1200 GRIT

TABLE 3

WebCode	Method	Tool Used	Grit Size
9QBD4P	None		
9T3CF3	I prepared the surface where number has been removed, the preparation includes filing the surface using a filing machine with a fine sanding paper.	Filing machine and sanding paper	
9XYRDQ	Sanding Polishing	Sand paper Polishing wheel	700
9Y76NC	Cleaning	Davis Reagent (Modified)	
A73MD9	Cleaning	Acetone	
A8ZNN7	None		
AA4JAV	Polishing	Dremel	
ACA28Q	Polishing	Dremel	
ADMNRQ	Visual Visual Visual Polishing	eyes Stereoscope Photographic Dremel	
AEYADL	Sanding Sanding Sanding Cleaning	Sand paper Sand paper Sand paper Ethanol	100 360 1200
AJDY2N	Sanding Sanding	Sand paper Sand paper	120 400
AJM3G9	Sanding	Sand paper	120-fine grit
AJRJE7	Visual	Microscope	
ALYRUH	Polishing	Dremel	
AVGH79	Sanding	Dremel	
AXBZT4	None	Stereoscope	
B284XV	Sanding	Sand paper	220
B4ELVR	Grinding Polishing	Dremel Polishing Wheel	
B67GKL	Visual Sanding	Microscope Sand paper	320
BAHHPP	Visual/Micro Sanding	Stereoscope Dremel Tool	180

TABLE 3

WebCode	Method	Tool Used	Grit Size
BHFXRQ	Visual	Stereoscope	
	Polishing	Dremel	
BWCAZU	Visual	Stereoscope	
	Visual	Magnet	
	Cleaning	Isopropanol	
	Polishing	Dremel	#425 wheel
BWXQFX	Sanding	Sand paper	200
	Polishing	Steel wool	
BZCKVU	Visual	Stereoscope	
C4T88E	Polish	Dremel	#240 wheel
	Polish	Dremel	#400 wheel
C4VPEP	Sanding	Sand paper	320, 600, 1200
C6Q9FR	Sanding	Dremel	180
CAGUZY	Visual Inspection	Stereo Microscope	
	Sanding	Foredom K. 2230	fine sanding (Dremel disc no 4)
	Polishing	Foredom K. 2230	Filt[sic]-tip polisher
CAV438	None		
CCKPJ2	Polish	Dremel	
CGG7YG	Polishing	Dremel tool	
CNGTNV	Sanding	Dremel	
CYJQW6	None		
CZPHF6	Visual	Stereoscope	
	Sanding	Sand paper	fine grit
	Polishing	Dremel	
D8MK7N	Sanding	Sand paper	100, 400, steel wool
DDABPX	Polishing	Dremel	120, 600
DFFTQE	Polishing	Dremel Tool / polishing wheel	
DGXMRN	Polishing	Dremel	
	Sanding	Sand paper	440 very fine
DHNT8E	Visual	Stereoscope	
	Sanding	Sand paper	fine grit 220
DRF6JV	Sanding	Sand paper	various
DTLUKJ	Polishing	Dremel	

TABLE 3

WebCode	Method	Tool Used	Grit Size
DVW2MC	Polishing	Dremel tool	
E2WBVP	Polishing	Dremel/Polishing Disk	
E6Y96W	Polishing	Dremel	120, 600
E77NDN	Visual		
	Polishing	Dremel	
E7QG4Z	Sanding	Sand paper	100
	Sanding	Sand paper	220
	Sanding	Sand paper	600
	Polishing	Steel wool	
E9WUUE	None		
EHZ63P	Polishing	Dremel	
EJTX9	Polishing	Polishe[sic]	
EJYBJJ	Visual/Microscopic	Stereo microscope	
	Polishig[sic]	Dremel -w- polishing wheel	
EP43WM	Visual	Stereoscope	
	Sanding	Sand paper	P600
	Polishing	Dremel	
EQU347	Visual	Microscope	
	Sanding	Sand paper	400
	Polishing	Rotary Tool	
ERB8L6	Polishing	Dremel	
ERPVPH	Visual		
	Sanding		220 grit
EUFYDH	Polishing	Rotary Tool	
F33DUT	Visual		
F4JCCX	Sanding	Sand paper	360, 400 and 1000
F8VGLC	Visual	Microscope	
F9QZMD	Visual	5X Eye Loupe	
	Polishing	Dremel	
F9TPUW	Electro-acid etching method	sand paper electrolytic method device	fine
FM9WK2	None		
FR6CHP	Visual	Stereoscope	
	Grinding	Dremel	

TABLE 3

WebCode	Method	Tool Used	Grit Size
FTX96X	Visual	Microscope	N/A
	Cleaning	Acetone	N/A
	Polishing	Sand paper	P 220
	Polishing	Sand paper	1000
FV4TTX	None	N/A	N/A
FYLT9D	Cleaning	Acetone	
G7GCPZ	Visual	Stereoscope	
G88KP3	Clean and polish area of obliteration using a dremel type tool with a sanding disc, and then a polishing disc	Dremel-type tool	
GA4PQQ	Visual	Eyes/Magnifying Glass	
	Sanding	Sand paper	220 grit/grain
GBXHLA	Visual	Stereoscope	
	Sanding	Sand paper	80, 150, 400
	Polishing	Steel wool	
	Visual	Stereoscope	
GCAAGC	Polishing	Dremel	Jeweler's polishing wheel
GF7XVX	Polishing	Emery paper	
GG8LKN	Sanding	Sand paper	400
	Polishing	Sand paper	600
GJAW7Q	Visual	Stereoscope	
	Sanding	Sand paper	medium
GLDFEK	Sanding	Sand paper	120
	Sanding	Sand paper	220
GUMWZY	Cleaning	Acetone	
GVZPED	Polishing	Rotary Tool	
GWW7QB	Visual	Stereoscope	
	Sanding	Sand paper	fine
GWYJMJ	Sanding	Sand paper	fine
H24RGT	Magnetic or not	Magnetic Yoke	N/A
	Visual	Desk lamp-magnifier	N/A
	Sanding	Dremel-tool	240 grit
	Polishing	Dremel-tool	N/A
H7CC36	Polishing	Rotary Tool	FINE GRIT SIZE
	Cleaning		

TABLE 3

WebCode	Method	Tool Used	Grit Size
H8BHJY	Sanding	Sand paper	240
HC7ATG	Sanding	Sand paper	320
	Sanding	Sand paper	600
	Sanding	Sand paper	1500
	Polishing	Simichrome	Simichrome
HX6B7K	Sanding	Sand paper	150, 220, and 400
J46GW8	Polishing	Dremel	1200
J4M4UN	Visual	Stereoscope	
	Polishing	Dremel	
J6ZZX9	Visual	Stereoscope	
	Sanding	Sand paper	150 and 400
J7FAYL	Visual, light source Photograph		
	Hand sanding	Emery paper	240 grit
	Hand sanding	Crocus cloth	600 grit
JEL2F4	Filed	File	
	Emory & Crocos	Paper	Fine
	Cleaned with Acetone	Qtip	
JEQCKM	Visual	Eyes, maglight	
	Sanding	Sand paper	400
	Sanding	Sand paper	1200
	Polishing	Dremel	Rotating polisher
JGQNVV	Sanding	Sand paper	220, 400 and 1000
JKEZWJ	Visual		
	Polishing	Dremel	
JKQZQT	Sanding	Sand paper	360
	Polishing	Sand paper	400
JLLHTU	Polishing	Sand paper	100, 220, 400
JNECRJ	Visual		
	Polishing	Rotary Tool	
JP7B4W	Dremel Polishing	Dremel	N/A
JRXGBF	Sanding	Dremel	Fine
JT99GB	Polished	Rotary Tool	
JYWTKQ	Polish	Emory[sic] paper	N/A
	Dremel	polish	#44 disc

TABLE 3

WebCode	Method	Tool Used	Grit Size
K3K6MZ	Sanding	Sand paper	120 FOLLOWED BY 280
K4KTEC	Visual Polishing	Microscope Steel wool	
K4ZEND	Visual Polishing Sanding	Stereoscope Dremel Abrasive slip stones	medium and fine grit
K7PK44	Polishing Sanding	Dremel Sand paper	400
K9V7WB	Visual/Microscopic Polish	Stereoscope Dremel	extra fine wheel
KALAKB	Polishing	Sand paper	400
KCV792	Sanding Polishing	Sand paper Dremel	120 and 80
KD8UR2	Sanding	sanding	coarse
KRT9VZ	Polishing	Dremel	Fine Texture (Red)
KXFWQ7	Sanding	Sand paper	320 then 600
KZLGFQ	Note: no visual number was visible. Only machining marks observed. Sanding Sanding & Polishing Use of alcohol soaked cotton wool to clean bar (before applying electro-acid etching method)	Dremil[sic] Dremil[sic] Manual swabbing	120 600
L36WLC	Polishing	Dremel	
L4HKM4	None		
LG4ZQ4	Polishing	Dremel	
LGNLG9	Polishing	Dremel	
LGPBMQ	I did little sanding then polished the surface with a soft cloth to be smooth	Dremel tool for sanding	It can be of plus or minus 1 mm in depth
LHVXXA	Polishing	Steel wool	
LJQGZB	Polishing	Dremel	
LN3JQD	Polishing	Dremel	

TABLE 3

WebCode	Method	Tool Used	Grit Size
LQD8M7	Visual Polishing	Stereoscope Dremel	
LV4JLA	Polishing	Dremel	medium grit polishing wheel
LV92K8	Visual Visual	Microscope Photographic with camera	
LVJZG3	Visual Polishing	Stereoscope Sand paper	
LVPC3D	Visual Sanding	Sand paper	320, 400
M4TPUZ	Visual Polishing	Stereoscope Rotary Tool	
M4Y2FC	Visual	Stereoscope	
M6P8W3	Sanding	Emery paper	Coarse
M73WYE	Sanding Sanding Sanding Polishing	Sand paper Sand paper Sand paper Steel wool	220 320 1200
M8UVBR	Polishing Cleaning	Sand paper Acetone	Grit size used N° 220 and 400
MD7UTC	Visual Polishing Visual	Dremel type tool	
MGHQB8	Polished	Dremel tool	400
MMNK64	Polishing	Dremel	
MRK49M	Sanding Polishing Visual	Dremer[sic] Tool	1 mm
MU9FAD	Polishing	Rotary Tool	
MVZCY8	Polishing	Dremal[sic]	
MWYLQ4	Polishing	Dremel	
MZYPKC	Visual Microscopic Sanding	Stereo Microscope Sand paper	400 grit

TABLE 3

WebCode	Method	Tool Used	Grit Size
N6MWF	Visual	Microscope	N/A
	Cleaning	Acetone	N/A
	Polishing	Sand paper	P 220
	Polishing	Sand paper	1000
N7HFGQ	Sanding	Sand paper	1000
NF84EE	Polishing	Rotary Tool	
NFJZJ	Visual	Stereoscope	
	Sanding	Sand paper	coarse
	Sanding	Sand paper	fine
	Visual	Microscope	
NMGRQR	Visual Inspection	Stereomicroscope	
	Sanding/Polishing	Sand paper	very fine
NQ64RH	Sanding	Dremel	between 120 and 240
	Sanding	Sand paper	120 and 240
NRW34V	Sanding	Sand paper	WET/DRY
NTUDYY	Polishing	Dremel	
NWTRK3	Sanding	Dremel	120
	Polishing	Dremel	Acessory #520
	Sanding	Sand paper	400
NX7GP2	Polishing	Dremel	
PAF8BA	Sanding	Sand paper	#600 Final
	Polishing	Fine loose grit on cloth	Microgrit WCA #15
PGC969	Polishing	Dremel	
PJXXMZ	Sanding	grit	400
	Polishing		
	Visual		
PL4HDK	light sanding	Dremel tool / hand	
	Polishing	Dremel tool / hand	
PP8ZPV	electro-acid etching process		
PWLY6R	Jkm C004 - Examination and restoration of erased identification numbers/markings.		
PZKB4D	Polishing	Dremel	
Q2A4B2	Sanding	Dremel	NA
Q7TYET	Polishing	Polishing wheel	

TABLE 3

WebCode	Method	Tool Used	Grit Size
Q9XLV4	Polishing	Sand paper	600
QA9NH3	Polish		
QAT6X7	visual microscopic polish	stereoscope dremel	
QD9ZD3	Visual inspection Polishing	N/A Dremel tool	
QLYKGF	Sanding	Sand paper	220 / very fine
QRPVRE	Polishing	Dremel	
QUE4YU	Sanding	Sand paper	fine
QY82Q7	Visual Sanding Polishing		400 600
R6TFRH	Sanding Polishing	Dremel Dremel	Fine
RD7CU4	Sanding Sanding Sanding	Sand paper Sand paper Sand paper	100 360 1200
RDLTPW	Sanding	Sand paper	fine
RKPVUW	Polishing	Dremel	Emery wheel on Dremel
RL43FE	Sanding	Sand paper	400
RNQRLD	Polishing	Emery paper	Finished with 1200 grit size.
RPG3C7	Polishing	Dremel	
RR2QUX	The surface was cleaned and burnished	Acetone and sandpaper	200
RR79TW	Visual Polishing		
RZWX6Q	Polishing Visual	Dremel Tool	Fine
T6PDDX	Sanding Polishing	Sand paper Sand paper	150 400
TC8L4F	Sanding	Dremel	fine

TABLE 3

WebCode	Method	Tool Used	Grit Size
TKZ48P	Visual Sanding Polishing Acids	Eyes Sand paper Polishing paper Nitric acid, Distilled water, Hydrochloric Acid, Copper (II) ammonium Chloride	32mm diameter 32mm diameter
TQ7MH2	Polishing	Dremel	
TXN2G2	Polishing	Dremel	
TXQQNJ	Polishing	Dremel	120/600
U2YFFQ	Sanding	Sanding paper	800
U8BEXC	None		
UDWAYF	I used a little bit of a sander then polished the surface with a soft cloth to smooth the surface	(Dremel) sander for polishing	it can be of plus/minus 1 mm in depth.
UJ34VW	Polishing	Dremel	
UP7YQP	Visual method Sanding & Polishing	Stereo microscope Sand paper & Polisher	fine
UVA2N	None		
UYWKWN	Polishing	Dremel	
UZNR37	Polishing	Dremel	N/A
V62RZX	Polish	Dremel Tool	
VE976K	Visual	Microscope	-
VJZQV8	Polishing	Dremel	
VM3CZ8	Sanding Polishing	Sand paper Steel wool	150, 400
VP6ABZ	Polishing	Dremel	
VRA33D	Sanding	Sand paper	360 & 307
VYBGNE	Lightly polished the obliterated surface area	Dremel Polisher	1mm
VZ68UT	Sanding	Sand paper	P400
W2F8QM	Visual	Stereoscope	
W4LRF9	Polishing	Dremel	
W8L3AM	Polishing	Dremel	fine cratex wheel

TABLE 3

WebCode	Method	Tool Used	Grit Size
WBJJMG	Polishing	Rotary Tool	
	Cleaning	Acetone	
WCARLK	Sanding	Dremel	438 band
	Polishing	Dremel	
WD8VN9	Sanding	Sand paper	P150 & 220
	Polishing	Sand paper	320 & 600
	Polishing	Dremel[sic]	
WFA3HK	Visual	Stereoscope	
	Polishing	Rotary Tool	
	None		
WGAUYZ	Visual	N/A	
WL22EN	None		
WL79U3	Polishing	Dremel	
WQWTP7	Polishing	Dremel	
WRRBR8	Polishing	Dremel	
WTK8DF	Lightly polished the obliterated area	Dremel polisher	1 mm
WTMY7W	Visual	Stereoscope	
	Cleaning	Acetone	
	None		
WXJHC2	Visual	Stereoscope	
	Polishing	Dremel	
XA4J3R	Visual	Stereoscope	
	Sanding	Sand paper	150 & 400
XNM3Z3	Polishing	Dremel	
XQEYNW	Polish	Dremel tool	
Y8DM7L	Sanding and Polishing with SiC Paper		400 grit and 120 grit
Y96TC4	None		
YBWP2X	Visual	Stereoscope	
	Sanding	Sand paper	320,400,1200
YKDLTH	Visual	Stereoscope	
	Polishing	Dremel	
YKNYU2	Grinding	Dremel	N/A
YMPC8T	Polishing	Dremel	

TABLE 3

WebCode	Method	Tool Used	Grit Size
YXBFER	Polishing	Dremel	
Z9JKYT	Polishing	Sand paper	150
	Sanding	Sand paper	150
ZAXZG2	Sanding	Dremel	240
ZDHU9V	Visual	Stereoscope	
ZE9ZPL	Sanding	Sand paper	medium
ZJMXW9	Polishing	Dremel	
ZL47ZE	Polishing	Emery paper	
ZX3V4U	Sanding	Sand paper	80-180
	Polishing	Dremel	
ZVNYD	Visual	Microscope	N/A
	Cleaning	Acetone	N/A
	Polishing	Sand paper	P220
	Polishing	Sand paper	1,000
ZZWCN4	Polishing	Emery paper	1200
	None	M7V1 Posi test	
	Visual	M2V1 Cast	

Response Summary

Participants: 302

Sample Preparation

Visual Method: 90

Sanding Method: 114

Polishing Method: 174

None: 22

Note: The totals 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

WebCode	Method	Time
26JQKN	Phosphoric/Nitric Acid then 25% Nitric with some rubbing of surface.	3 minutes / 1 minute
27EALP	Acid Etch Method	Nitric acid 25%, 5 minutes
2ACVB8	MagnaFlux Acidic Ferric Chloride 10% Sodium Hydroxide Acid Etch Method	approximately 15 minutes approximately 2 minutes approximately 5 minutes (20% Nitric Acid)
2B8DD9	Ecid[sic] etching	+/- 15 min
2BNLMW	Zinc Reagent #1 (H3PO4/HNO3) Zinc Reagent #2 (dilute HNO3)	1-2 minutes 30-45 seconds
2CJ4NX	Ferric Chloride Acidic Ferric Chloride Phosphoric/Nitric Acid Nitric Acid Sodium Hydroxide Fry's Reagent	Spent a total of 2 1/2 days on bar stock
2NTQPH	Atlanta 2 Step Phosphoric/Nitric Acid	2 minutes total
2P7FRV	Zink[sic] Alloy Acid Etch (Phosphoric Acid & Nitric Acid)	Pool & wipe +/- 45 minutes total
2QJRWR	Acid Etch Method	Alternate application between Phosphoric and Nitric Acids until characters developed, approximately 8-10 minutes.
2QXCGP	Acidic Ferric Chloride Ferric Chloride touch of Turner's & NaOH	~5 min total (in multiple applications)
2QZ9ME	Acid Etch Method	10-15 seconds
2WKBKH	25% Nitric Acid	~2 minutes
2XW2XT	Fry's Reagent	10/sec per use
2ZQHH3	Acid Etch Method	Lab method - M8 V1 - Approx 50 - 60mins

TABLE 4

WebCode	Method	Time
32BX2A	Acidic Ferric Chloride Ferric Chloride Sodium hydroxide Nitric acid	20 minutes 20 minutes
33R6BX	Acidic Ferric Chloride	~100 swabs
34923X	Acidic Ferric Chloride Turner's Reagent Fry's Reagent	5 min 5 min 5 min
3836JH	Acidic Ferric Chloride	20-30 SEC PER APPLICATION
3B64WW	Chemical Etching Ferric Chloride & 25% Nitric Acid	material was swabbed etchant not left standing on material <5 minutes
3BZQBL	Sodium Hydroxide 10% Ferric Chloride Acidic Ferric Chloride Nitric Acid 25%	Few seconds per swab. Few seconds per swab. Few seconds per swab. Few seconds per swab.
3D6C27	Acid Etch Method Acidic Ferric Chloride Acid Etch Method	Approximately 30 seconds (20% Nitric Acid) Approximately 30 seconds Approximately 30 seconds (20% Nitric Acid)
3MUZXU	Acid etching - Zinc Alloy Solutions (1 & 2) Acid etching - Ferric Chloride Acid etching - Zinc Alloy Solutions (1 & 2)	continuous swabbing - less than one minute continuous swabbing - approx one minute continuous swabbing - approx five minutes
3NPHZV	Acid Etch Method	two minutes
3PK7EK	Fry's Reagent	30 MINUTES
3QFPFL	Acidic Ferric Chloride	15 MINUTES

TABLE 4

WebCode	Method	Time
3RTGBN	Acidic Ferric Chloride	multiple swipes over 10 minutes
	25% Nitric Acid	one swipe to highlight
	Davis Reagent	multiple swipes over 3 minutes
	25% Nitric Acid	one swipe to highlight
	Turner's Reagent	multiple swipes over 20 minutes
	polishing	polish to clean
	Fry's Reagent	multiple swipes over 2 minutes
	25% Nitric Acid	one swipe to highlight
3UD7U2	Fry's Reagent	multiple swipes over 2 minutes
	Acid Etch Method	swabbed
3ZJYPW	Acid Etch Method	left on surface for intervals of 20-50 seconds before wiped off then swiped over area for 5-10 seconds
	Acidic Ferric Chloride	swiped across the surface for 5-10 seconds followed by 10 second application of 25% nitric acid
438NVV	Acid Etch Method	~ 1 sec or less
477ZQV	acidic ferric chloride acid etch	~2 mins.
	25% nitric acid etch	~1 min.
482HTW	Acidic Ferric Chloride	30 minutes
4GK94M	Ferric Chloride	a few seconds
	25% Nitric Acid	a few seconds
4LE34A	Acid Etch Method	Total 44 minutes
	Ferric Chloride	15 minutes
	Acidic Ferric Chloride	15 minutes
	Ferric Chloride	12 minutes
	Acidic Ferric Chloride	2 minutes
4R2QYE	Ferric Chloride/Nitric Acid	continuous for approx 30 minutes
4TFF2R	Acidic Ferric Chloride	Less than one minute
	Ferric Chloride	Less than one minute
	Fry's Reagent	Less than one minute
4TG2TD	Ferric Chloride (Acid Etch)	seconds (few)
	Nitric Acid (acid etch)	seconds (few)

TABLE 4

WebCode	Method	Time
4UVG6U	sand paper	
	Acidic Ferric Chloride	30 seconds to 1 minute
	deionized water rinse	
	polishing	
	Acidic Ferric Chloride	30 seconds to 1 minute
	deionized water rinse	
	sand paper	
	Acidic Ferric Chloride	30 seconds to 1 minute
	deionized water rinse	
	polishing	
4WDWEL	Acidic Ferric Chloride	30 seconds to 1 minute
	deionized water rinse	
	10% HCl	30 seconds to 1 minute
	polishing	
	10% HCl	30 seconds to 1 minute
	deionized water rinse	
	Acidic Ferric Chloride	30 seconds to 1 minute
	deionized water rinse	
	Fry's Reagent	5 mn
	4XR3XH	Acidic Ferric Chloride
672RCF	Phosphoric/Nitric acid solution	10 minutes
	Dilute Nitric acid solution	10 minutes
6DFXMD	Other	
6DYT6E	Acid Etch	five seconds
6EYJLV	Acid Etch Method	Ferric Chloride - 1 minute
	Acidic Ferric Chloride	approximately 30 seconds
	Acid Etch Method	10% Nitric Acid - 1 minute
	Acid Etch Method	Ferric Chloride - 1 minute 30 seconds
	Acid Etch Method	10% Nitric Acid - 2 minutes
6HCJJM	Acid Etch Method	30 min
6KKLGE	Electro-acid	
6N3UTK	Acid Etch Method	3x45"
6RNJDX	Electrolytic - 10% sodium hydroxide	Characters were brought up in less than 2 minutes.

TABLE 4

WebCode	Method	Time
6TWUY	Acidic Ferric Chloride	One minute
	25% Nitric Acid swab	15 seconds
	Acidic Ferric Chloride	One minute
	25% Nitric Acid swab	15 seconds
	Acidic Ferric Chloride	One minute
	25% Nitric Acid swab	15 seconds
	Rinse with distilled water	Rub dry
6XBJEW	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	5 minutes
	Hydrochloric acid solution	5 minutes
	Nitric acid solution	5 minutes
78VZW6	Acid Etch	Until number became visible
7WCH7J	Phosphoric/Nitric Acid	5-8 minutes
	25% Nitric Acid	30 seconds - 1 minute
7WPCHD	Fry's Reagent	
	Acidic Ferric Chloride	
7YFDPM	Zinc Alloy Solutions (2-step)	5-6 rounds of solutions #1 and #2, approximately 3 minutes per round.
86Y4M2	Acid Etch Method	4 swabs (Acidified Ferric Chloride)
	Acid Etch Method	10 swabs (Nitric Acid)
88QYAA	Clean cotton wool swab using 10% sodium hydroxide solution.	
8ATXMN	Fry's Reagent	less than 5 seconds
	Acid Etch Method	30 second intervals
	Acidic Ferric Chloride	30 second intervals
8DEM6F	sand paper to smooth p220	
	then used Nitric Acid	2 min
	an acidic ferric reagent	2 min
	Then used together	
8GC4GA	25% Ferric chloride solution applied to surface for a few seconds. No characters appeared.	
	25% Nitric Acid was applied to the surface. Characters appeared immediately.	three seconds
8XYGXM	Acid Etch Method	Ferric chloride
	Fry's Reagent	Very dilute Fry's

TABLE 4

WebCode	Method	Time
92WHBP	Acid Etch Method	three applications of about one minute each
94H7TG	HCL 50%-DISTILLED WATER 50%	
96T7RW	Acid Etch Method	1-2 seconds at a time
97A3JV	Acidic Ferric Chloride	3 min
	Cobalt Chloride	3 min
	Nitric Acid	5 min
97NPTX	25% Nitric Acid	3-5 min
	Ferric Chloride	3-5 min
	25% Nitric Acid	2-4 min
	Ferric Chloride	3-5 min
99XRPU	Acidic Ferric Chloride	2-3 hours
	25% nitric acid for contrast	a few seconds
9E3B6M	Acid Etch Method	Hf - less than 1 minute
9EKJTG	Restor-A-Gel - Aluminum (Mercuric Chloride)	Approximately 1 hour 45 minutes
9FY4LR	Ferric Chloride	45 min
	Nitric Acid	15 min
9K4Y98	Acid Etch Method	2 min.
9KN9QN	miproacies[sic]	15 min.
9L3XU2	Ferric Chloride	
	Acidic Ferric Chloride	2-4 sec
	Nitric Acid 25%	swabbed
	NaOH (25%)	
9MVQPK	Acid Etch Method	maximum- around 5 minutes
9N8HJM	Acid Etch Method	3-5 min
	Acid Etch Method	1 min
9Q3Y6W	Acid Etch Method	HCL applied for 45 minutes
9QBD4P	Acid Etch Method	swabbed on area, not ponded (pooled)
9T3CF3	Electro-acid etching process	25 seconds
9XYRDQ	MagnaFlux	
	10% NaOH	
	Ferric Chloride	
	Acidic Ferric Chloride	<1 minute

TABLE 4

WebCode	Method	Time
9Y76NC	Electrochemical treatment using Davis Reagent (Modified) were used about one (1) minute	One (1) minute
A73MD9	Etching reagent: Cupric Ammonium Chloride solution	
A8ZNN7	10% Sodium Hydroxide Solution	5 minutes
	Acid Etch Method	45 minutes
AA4JAV	Acid Etch Method	5 min. 10% NaOH electrolytic
	Acid Etch Method	1 min. 25% Nitric Acid
ACA28Q	Ferric chloride, repeat x3 (alternating)	~5 seconds each time
	10% Sodium hydroxide, repeat x3 (alternating)	~5 seconds each time
	Griffin's, repeat x3	~3 seconds each time
ADMNRQ	Acidic Ferric Chloride	constant swabbing 10-15 minutes
	10% Nitric Acid	Swabbed briefly for contrast
AEYADL	Fry's Reagent	1 minute
	Ferric Chloride	15 minutes
AJDY2N	Phosphoric/Nitric Acid	~30 seconds
AJM3G9	25% HNO3	10 minutes
AJRJE7	Acid Etch Method	10 min
ALYRUH	Acid Etch Method	Less than 1 minute
AVGH79	Acid Etch	+/- 10 minutes
AXBZT4	NaOH	15 minute
B284XV	Ferric Chloride	~ 5 seconds with each use
	Acidic Ferric Chloride	~ 5 seconds with each use
	25% Nitric Acid	~ 10 seconds with each use
	10% Sodium Hydroxide	Only used once at the end to make the serial number clear for verification
B4ELVR	Acidic Ferric Chloride	4 minutes
	Nitric Acid (20%)	8 minutes
B67GKL	Ferric chloride	10 seconds
	10% nitric acid	10 seconds
	alternating ferric chloride/10% nitric acide[sic]	10 seconds each
BAHPPP	Chemical (Acidic Ferric Chloride)	~10 seconds
	Nitric Acid 25%	~5 seconds

TABLE 4

WebCode	Method	Time
BHFXRQ	Acidic Ferric Chloride	1 MIN
	25% Nitric Acid	1 MIN
	50% Nitric Acid	1 MIN
BWCAZU	Ferric Chloride	<1 min
	Acidic Ferric Chloride	~5min @ 30 second intervals
	Nitric Acid (25%)	<1 minute total
BWXQFX	Fry's Reagent	30sec
	Acid Etch Method	10 min
BZCKVU	Acidic Ferric Chloride	2-3 minutes
	25% Nitric Acid	2-3 minutes
C4T88E	Chemical Restoration - Chromic Acid	2 minute increments - 10 min total
C4VPEP	Acid Etch Method	approx 5 -10 seconds
C6Q9FR	Visual	
	Sanding	
	Ferric Chloride	~15 seconds
	Acidic Ferric Chloride	~30 seconds
	Nitric Acid	~15 seconds
CAGUZY	Acid Etch	+/- 5 minutes
CAV438	10% Nitrate Acid	approximately 5 min
CCKPJ2	Ferric Chloride Reagent	5 min
	Nitric Acid 25%	10 min
	Sodium Hydroxide	5 min
CGG7YG	Chemical etching	approx 15 minutes
CNGTNV	25% Nitric Acid	2 mins
CYJQW6	Etching using 10% NaOH	
CZPHF6	Acid Etch Method	25% HNO ₃ ~5 mins
	Acid Etch Method	50% HNO ₃ ~10 mins
	Acid Etch Method	FeCl ₃ – H ₂ O ~3 mins
	Acid Etch Method	10% NaOH ~14 mins
D8MK7N	MagnaFlux	
	Acid Etch Method	10 - 30 seconds at a time for approx 7 - 10 minutes.
DDABPX	Nitric Acid	+/- 2 minutes

TABLE 4

WebCode	Method	Time
DFFTQE	Acid Etch 85% H3PO4/HNO3	10-15 seconds
	Acid Etch 20% HNO3	10-15 seconds
	Acid Etch 10% HNO3	10-15 seconds
DGXMRN	Acid Etch Method	10-15 Minutes
DHNT8E	Acidic Ferric Chloride	1 hour
	Other	
DRF6JV	Chemical Etch	
	Ferric Chloride	2 mins
	Acidic Ferric	1 min
	Nitric Acid	30 seconds
	Sodium Hydroxide	1 min
DTLUKJ	Acidic Ferric Chloride	10 seconds
DVV2MC	Chemical Etching - Ferric Chloride	Several seconds to several minutes
	Chemical Etching - Acidic Ferric Chloride	Several seconds to several minutes
	Chemical Etching - Ferric Chloride	Several seconds to several minutes
	Chemical Etching - 25% Nitric Acid	Several seconds to several minutes
E2WBVP	Acidic Ferric Acid	5 min
	Cobalt Chloride	30 sec
	Acidic Ferric Acid	20 min
	Acidic Ferric Acid (Diluted)	5 min
E6Y96W	Nitric Acid	+/- 2 min
E77NDN	Fry's Reagent	1 min
	Nitric Acid	2-3 min
	Phosphoric Acid	1-2 min
E7QG4Z	Acidic Ferric Chloride	25 minutes
	Acid Etch Method	5 minutes
E9WUUE	WAZAU (CuCL2, Na CL)	3 minutes
EHZ63P	MagnaFlux	
	Ferric Chloride	Not Recorded. Estimated[sic] to be 1 to 3 minute intervals.
	Nitric Acid	Not Recorded. Estimated[sic] to be 1 to 3 minute intervals.
EJTXX9	Fry's Reagent	Ten minutes

TABLE 4

WebCode	Method	Time
EJYBJJ	Phosphoric acid/nitric acid solution	~10 seconds
	25% nitric acid solution	~5 seconds
	Phosphoric acid/nitric acid	~30 seconds
	25% nitric acid	~5 seconds
	Phosphoric acid/nitric acid	~10 seconds
	25% nitric acid	~3 seconds
EP43WM	25% Nitric Acid	2-3 min
EQU347	Ferric Chloride	10-15 seconds
ERB8L6	Acid Etch Method	2-5 minutes
	Griffin Reagent	20 seconds
	10% Sodium Hydroxide	5 minutes
	Griffin Reagent	20 seconds
	Fry's Reagent	10 seconds
	Griffin Reagent	20 seconds
	Acid Etch Method	2-5 minutes
	Acid Etch Method	5 minutes
	Electrolytic (10% Sodium Hydroxide)	15 minutes
ERPVPH	Ferric Chloride	alternated between the two
	50% Nitric Acid	about ten seconds each
EUFYDH	Acidic Ferric Chloride water	30 seconds
	Acidic Ferric Chloride wiped with tissue	30 seconds
	Acidic Ferric Chloride wiped with tissue	30 seconds
	Acidic Ferric Chloride wiped with tissue	30 seconds
	Acidic Ferric Chloride wiped with tissue	30 seconds
F33DUT	Acid Etch Method	5 seconds (20% Nitric Acid)
	Acid Etch Method	3 seconds (Acidic Ferric Chloride)
F4JCCX	Ferric chloride 27% m/v	Not applied
	Acidic Ferric Chloride	Less than a minute
	Sodium hydroxide 13.5% m/v	Not applied
	Nitric acid 25%	Less than a minute

TABLE 4

WebCode	Method	Time
F8VGLC	Ferric Chloride	Swabbed (~15 mins)
	Acidic Ferric Chloride	Swabbed (~15 mins)
	Nitric Acid (25%)	Swabbed (~5 mins)
	Polishing (done in between swabbing)	One time (~10 sec)
F9QZMD	Acid Etch Method	
	Pot Metal Sol.1	10 Seconds
	Aqua Regia	20 Seconds
	25 % Nitric Acid	20 Seconds
F9TPUW	Electro-acid etching method	+/- 10 min
FM9WK2	25% Nitric Acid	3-5 Minutes
FR6CHP	Ferric Chloride	5 Minutes
	Acidic Ferric Chloride	5 Minutes
	25% Nitric Acid	2 Minutes
FTX96X	Acid Etch Method	Total: 23 minutes
	Ferric Chloride	16 minutes
	Acidic Ferric Chloride	7 minutes
FV4TTX	Ferric Chloride	~5 minutes
	Acidic Ferric Chloride	~5 minutes
	Phosphoric / Nitric Acid	~20 minutes
	25% Nitric Acid	~2 minutes
FYLT9D	Electrolytic etching using 10% sodium hydroxide.	
G7GCPZ	10% aqueous Sodium Hydroxide	
G88KP3	After polishing/sanding, clean surface with acetone/methanol then apply acid etch (chemical Green Mamba) with cotton swabs and observe for appearance of numbers and wipe acid off with cotton swab (dipped in methanol), [continued] continue process if/when some digits aren't visible.	In total, about 20 minutes or more
GA4PQQ	Ferric Chloride	several seconds at a time
	Acidic Ferric Chloride	several seconds at a time
	25% Nitric Acid	several seconds at a time
	10% Sodium Hydroxide	several seconds at a time

TABLE 4

WebCode	Method	Time
GBXHLA	Acid Etch Method	Ferric Chloride 10 min
	Acidic Ferric Chloride	10 min
	Acid Etch Method	Alternation Ferric Chloride & 25% Nitric Acid 5 min each for 100 min
	Acid Etch Method	25% Nitric Acid for 5 min with no cotton swab
GCAAGC	25% Nitric Acid and Phosphoric Acid (2 step)	Constantly moving applicator-5 mins
GF7VXX	Other	less of a minute
GG8LKN	Fry's Reagent	5 minutes in total
GJAW7Q	Fry's Reagent	a few seconds
	25% Nitric Acid	a few seconds
GLDFEK	Sodium Hydroxide	~1 hour (total)
	Ferric Chloride	30-40 sec each app.
	Fry's Reagent	15-30 sec each application[sic]
	Nitric Acid 25%	15-20 sec. each application
	Acidic Ferric Chloride	15-20 sec. each application
GUMWZY	Fry's Reagent	
GVZPED	Acidic Ferric Chloride	
	25% Nitric Acid	
	Acidic Ferric Chloride	
	Phosphoric/Nitric Acid	
	Acidic Ferric Chloride	
	25% Nitric Acid	
GWW7QB	Acid Etch Method	Ferric Chloride
	Acid Etch Method	10% Sodium Hydroxide
	Acid Etch Method	Ferric Chloride
	Acid Etch Method	25% Nitric acid
GWYJMJ	Acidic Ferric Chloride	~30 sec increments, ~20x's
	Fry's Reagent	~10 sec increments, ~5x's
	Acidic Ferric Chloride/NaOH	~30 sec/~10 sec, ~5x's
	MagnaFlux	
	FeCl3/25% HNO3	~30 sec/~30 sec, ~20x's

TABLE 4

WebCode	Method	Time
H24RGT	Acid Etch - Flicks	3 seconds
	Acid Etch - Green Mamba	2 seconds
	Electro-Acid Etch - Green Mamba	2 seconds
H7CC36	PALMERTON REAGENT	35 MINUTES
H8BHJY	Acidic Ferric Chloride	30-60 second for 10 times, alternate wash with distilled water.
HC7ATG	Acid Etch Method	less than a minute
HX6B7K	Acid Etch Method	5 minutes
J46GW8	Acid Etch Method	2 minutes
J4M4UN	Acidic Ferric Chloride	5 - 10 seconds for each application
J6ZZX9	10% Sodium Hydroxide	
	Ferric Chloride	
	Acidic Ferric Chloride	30 seconds
	Ferric Chloride	
	25% Nitric Acid (pooling)	20 minutes
J7FAYL	Acid Etch	
	Swab using 10% Nitric Acid solution	3 minutes
JEL2F4	Acid Etch	Total 20 minutes
	Acetone between Acid Etch	
JEQCKM	5% HCl in ethyl alcohol	15 min nil react.
	5% HCl aqueous	Metal lighten, 30 min
	50% HCl/50% HNO3 alternately used	60 min
JGQNV	Acidic Ferric Chloride	Less than a minute
	Ferric Chloride	Less than a minute
	Sodium Hydroxide 13.5 m/v	Less than a minute
	Nitric Acid 25 % v/v	Less than a minute
JKEZWJ	Ferric Chloride	1-2 mins.
	Acidic Ferric Chloride	1-2 mins.
	Nitric Acid	2-3 mins.
JKQZQT	Acidic Ferric Chloride	Less than a minute
	Ferric chloride	Not apply
	Hydrochloric acid 25%	Less than a minute
JLLHTU	Acid Etch Method	HCl 10 minutes

TABLE 4

WebCode	Method	Time
JNECRJ	Acidic Ferric Chloride	1-2 minutes
	Nitric Acid	4 minutes
JP7B4W	Ferric Chloride	(2:30) 1 min, 20 sec, 20 sec, 20 sec, 30 sec
	Acidic Ferric Chloride	(16 min) 1 min, 2 min, 1 min, 2 min, 3 min, 1 min, 3 min, 1 min, 2 min
	10% Nitric Acid	(1:40) 20 sec, 20 sec, 30 sec, 30 sec
JRXGBF	Ferric Chloride Solution	45 minutes
	Acidic Ferric Chloride	30 minutes
	10% Sodium Hydroxide	5 minutes
	10% Nitric Acid	5 minutes
JT99GB	Aluminum Solution 017-16-01	1 minute
	Phosphoric Nitric 008-16-01	1 minute
JYWTKQ	Ferric Chloride 100%	2 min. no response
	Nitric Acid 25%	5 min.
	Sodium Hydroxide 10%	2 min. for contrast
K3K6MZ	Acid Etch Method	2-4 MINUTES
K4KTEC	Ferric Chloride	2 applications at 2 minutes.
K4ZEND	25% Nitric Acid	Instantaneous reaction and faded after time
K7PK44	Acidic Ferric Chloride	15 MINUTES
	CHEMICAL HIDROCHLORIC ACID 25%	10 MINUTES
K9V7WB	Nitric Acid 25%	2 minutes (performed twice)
	Sulfuric Acid 30%	30-45 seconds
KALAKB	Fry's Reagent	5 minutes
KCV792	Acid Etch Method	Acid was wiped over with a cotton bud for approximately 5 minutes.
KD8UR2	Acidic Ferric Chloride	2 mins
KRT9VZ	Phosphoric Acid	8 min
	Nitric Acid	2 min
KXFWQ7	Acid Etch Method	30 seconds
KZLGFQ	Electro-acid etching (with Green Mamba acid solution & electric current.)	+/- 2 minutes altogether. Acid applied at 4 intervals of 30 seconds each, with deactivation (via alcohol swabs) in between each acid application.
L36WLC	FeCl ₃	10 Min

TABLE 4

WebCode	Method	Time
L4HKM4	Sodium Hydroxyde[sic] 10%	10 sec
	Acid Etch Method	1 min
LG4ZQ4	Acidic Ferric Chloride	30 seconds
	Phosphoric Nitric Acid	2 minues
	25% Nitric Acid	30 seconds
LGNLG9	Acid Etch Method	
	PHOSPHORIC ACID/NITRIC ACID	15 MINUTES
	NITRIC ACID	10 MINUTES
LGPBMQ	Electro-acid etching process was used to recover obliterated serial numbers	It took about +/- 10 mins
LHVXA	Acidic Ferric Chloride	
	Fry's Reagent	
LJQGZB	10% NaOH	10 minutes with cotton swab
	Acidic Ferric Chloride	10 minutes with cotton swab
LN3JQD	Ferric Chloride	~10-20 sec while wiping
	Nitric Acid	~2-5 sec while wiping
	Acidic Ferric Chloride	~5-10 seconds once
LQD8M7	Ferric Chloride	
	Acidic Ferric Chloride	
	25% Nitric acid	
LV4JLA	25% nitric acid	1-2 minutes
LV92K8	Acidic Ferric Chloride	45 minutes
	25% Nitric Acid	45 minutes
	10% Sodium Hydroxide	45 minutes
LVJZG3	Chemical Method with Zinc alloy etching	1 hour
LVPC3D	Acid Etch Method	Knowles Process - 85% phosphoric acid, concentrated nitric acid
	Acid Etch Method	25% Nitric Acid
M4TPUZ	Hydrochloric acid	Approximately two minutes
M4Y2FC	Acid Etch Method	few seconds at the time, several times, alltogether[sic] 10-15 min
M6P8W3	Acidic Ferric Chloride	5-10 seconds per application
M73WYE	Ferric Chloride	~10 min
	Acidic Ferric Chloride	~3 min

TABLE 4

WebCode	Method	Time
M8UVBR	Fry's Reagent	About 5 minutes
MD7UTC	MagnaFlux	
	Acidic Ferric Chloride	~30 sec
	Acidic Ferric Chloride	~30 sec
	Dremel type tool	polishing
	Acidic Ferric Chloride	~30 sec
	Acidic Ferric Chloride	~30 sec
	Dremel type tool	polishing
	25% Nitric Acid	~10 sec
	Dremel type tool	polishing
	Acidic Ferric Chloride	~30 sec
	Acidic Ferric Chloride	~30 sec
	Dremel type tool	polishing
	NaOH	~10 sec
	Dremel type tool	polishing
	Acidic Ferric Chloride	3 hours
MGHQB8	MagnaFlux	negative
	Nitric Acid (15%)	<5 mins
	Wash H2O	
MMNK64	Acid Etch Method	APPROXIMATELY 2 MINUTES
MRK49M	Ecid[sic] Etching	+/- 30 min
MU9FAD	Acidic Ferric Chloride	< 5 sec
	Ferric Chloride (non acidic)	
	Davis Reagent	< 5 sec
MVZCY8	Chemical Etching	
	25% Sulfuric Acid	20-30 seconds (Each application)
	Phosphoric / Nitric Acid	20-30 seconds (Each application)
	5% Nitric Acid	20-30 seconds (Each application)
	Ferric Chloride	20-30 seconds (Each application)
MWYLQ4	Acid Etch Method	1 MINUTE
	AQUA REGIA	
MZYPKC	Primarily phosphoric/nitric occasionally acidic/ferric chloride to darken	Applied with a cotton tip applicator leaving the acid on the area for 10-15 seconds then wiping the area with a kimwipe.

TABLE 4

WebCode	Method	Time
N6MWFP	Acid Etch Method	Total: 88 minutes
	Ferric Chloride	38 minutes
	Acidic Ferric Chloride	50 minutes
N7HFGQ	Acidic Ferric Chloride	One minute
	Ferric chloride 19%	One minute
	Sodium hydroxide 13.5%	One minute
NF84EE	Acidic Ferric Chloride	5-10 Min
	Acid Etch Method	5-10 Min
NFJZJJ	Fry's Reagent	ten seconds at a time over 45 minutes
NMGRQR	Ferric Chloride	approx 15 sec.
	NaOH	approx 10 sec.
	Ferric Chloride	approx 20 sec.
	Nitric Acid 25%	approx 15 sec.
	NaOH	approx 10 sec.
	Nitric Acid	approx 15-20 sec.
NQ64RH	Acidic Ferric Chloride	10 minutes
	Ferric Chloride	10 minutes
	Sodium Hydroxide	10 minutes
	Nitric Acid	10 minutes
	MagnaFlux	2 minutes
NRW34V	Phosphoric Acid/ 10% Nitric Acid	5 minutes
NTUDYY	Phosphoric/Nitric Acid	15 minutes
	Dilute Nitric Acid	15 minutes
NWTRK3	Ferric Chloride	~5 seconds between each swipe
	Nitric Acid 25%	~5 seconds between each swipe
NX7GP2	Phosphoric Nitric Acid and 25% Nitric Acid	10 minutes and 30 seconds
PAF8BA	Phosphoric/nitric acid	1 to 5 minutes per application
	25% nitric acid	1 to 5 minutes per application
	Ferric chloride solution	1 to 5 minutes per application
	DI water rinses	
PGC969	Ferric Chloride/Acidic Ferric Chloride	1-2 minutes
	Acidic Ferric Chloride/25% Nitric Acid	2-3 minutes

TABLE 4

WebCode	Method	Time
PJXXMZ	MagnaFlux	1 hour
	Acido Nitrico 5%	10 minutes
	Fry's Reagent	10 minutes
PL4HDK	Flicks	+/- 10 mins
	Nitric Acid	+/- 10 mins
PP8ZPV	electro-acid etch	+/- 15 minutes
PWLY6R	Chemical treatment using 5% NaOH solution for 15 minutes follow by	15 minutes
	Electrochemical treatment using Cupric Ammonium Chloride solution for 8 minutes	8 minutes
PZKB4D	Ferric Chloride	Several brief applications (not timed)
	Acidic Ferric Chloride	Several brief applications (not timed)
	Fry's Reagent	Several brief applications (not timed)
	25% Nitric Acid Solution	Several brief applications (not timed)
Q2A4B2	Acidic Ferric Chloride	5 - 10 seconds
	Acid Etch Method	5 - 10 seconds
Q7TYET	MagnaFlux	10 seconds, one time
	Acidic Ferric Chloride	10 seconds, two times
	Phosphoric Acid/Nitric Acid	2-3 seconds, multiple applications
	Nitric Acid	2-3 seconds, multiple applications
Q9XLV4	HF based solution	15 minutes
QA9NH3	Acidic Ferric Chloride	4-5 sec
	Ferric Chloride	4-5 sec
	Aluminum Solution	4-5 sec
	Water	2 sec
	Acidic Ferric Chloride	4-5 sec
	Aluminum Solution	4-5 sec
	Water	4-5 sec
QAT6X7	25% Nitric Acid	<5 minutes
	30% Sulfuric Acid	1-2 minutes
	Fry's Reagent	<1 minute

TABLE 4

WebCode	Method	Time
QD9ZD3	Acidic Ferric Chloride w/Ferric Chl.	1-3 mins
	Acidic Ferric w/ 25% Nitric Acid	1-3 mins
	Aluminum Solution (25% Sulfuric Acid)	1-2 mins
	Acidic Ferric w/ 25% Nitric Acid	1-3 mins
	Polishing then Acid Ferric w/ 25% Nitric Acid	1-5 mins
QLYKGF	Acidic Ferric Chloride	
QRPVRE	Acid Etch Method	NITRIC ACID WAS APPLIED WITH A COTTON APPLICATOR USING CONTINUOUS MOTION.[sic] THE ACID WAS NOT LEFT ON THE MATERIAL FOR ANY EXTENDED LENGTH OF TIME.
QUE4YU	Acid Etch Method	ferric chloride 5-10 mins. / acidic ferric chloride 5-10 mins.
QY82Q7	Phosphoric	~30 sec. using cotton swabs
	Ferric Chloride	Ditto
	10% Nitric	Ditto
R6TFRH	Nitric acid	+/- 3 min.
RD7CU4	Fry's Reagent	1 minute
	Ferric Chloride (non-acidic)	
RDLPW	Acid Etch Method	10 - 15 minutes, 2 times; 5 min. 1 time
RKPVUW	Acid Etch Method	approx 5 mins
RL43FE	Acidic Ferric Chloride	About 5 seconds to locate area
	Acidic Ferric Chloride	About 5 seconds, characters located
	Acidic Ferric Chloride	About 5 seconds, partial recovery
	Acidic Ferric Chloride	About 5 seconds, partial recovery
	Acidic Ferric Chloride	About 5 seconds, characters recovered
	Acidic Ferric Chloride	About 5 seconds, repeated recovery
RNQRLD	Acid Etch Method	Approximately 10 minutes
RPG3C7	Acid Etch Method	1-5 minutes at a time, with multiple applications spanning approximately 45 minutes.
RR2QUX	Electrolytic process of etching by acid mixture (1 ml of nitric acid and 1 ml of phosphoric acid in 20 ml of water)	few minutes only
RR79TW	Fry's Reagent	

TABLE 4

WebCode	Method	Time
RZWX6Q	Polishing Acid Etch - Chromic Acid Visual	1 hour total
T6PDDX	Ferric Chloride Diluted FeCl (50/50 mixture) 10% Sodium Hydroxide	~5 seconds ~10 seconds ~1 minute
TC8L4F	Acidic Ferric Chloride NaOH 25% Nitric Acid Ferric Acid	2-6 seconds each time (~15 times total) 2-3 seconds at a time (~5 times total) 2-3 seconds at a time (~5 times total) 2-6 seconds each time (~10 times total)
TKZ48P	Acid Etch Acid Etch	For about +/- 5 min
TQ7MH2	Acidic Ferric Chloride	15 minutes
TXN2G2	Acidic Ferric Chloride Fry's Reagent AQUA-REGIA	7-10 MINUTES 3-5 MINUTES 10-15 MINUTES
TXQQNJ	Nitric acid	+/- 3 min
U2YFFQ	Fry's Solution	<5 minutes
U8BEXC	Modified Fry's Reagent Nickels & Alloys Reagent	1 min. 1 min.
UDWAYF	Electro-acid etching process was used to recover obliterated serial number	Took about +/- 15 minutes
UJ34VW	Acidic Ferric Chloride 25% Nitric Acid Phosphoric Nitric Acid	less than 60 seconds less than 60 seconds less than 60 seconds
UP7YQP	Acid Etch Electro-magnetic method	+/- 1 minute +/- 2 minutes
UVWA2N	Acid Etch Method	
UYWKWN	MagnaFlux 10% Sodium Hydroxide Ferric Chloride Polish Ferric Chloride 10 % Sodium Hydroxide 50% Nitric Acid	 3 min 5 min 5 min 2 min 5 min

TABLE 4

WebCode	Method	Time
UZNR37	Nitric Acid 10%	2 to 3 minutes
	Nitric Acid 25%	1 to 2 minutes
	Acidic Ferric Chloride	Less than 1 minute
V62RZX	Ferric Chloride	3 min
	25% Nitric Acid	5 min
	5% Nitric Acid	5 min
VE976K	Acid Etch Method	At interval of 1-2 minutes
VJZQV8	Acid Etch Method	less than 1 min. per application
	Ferric Chloride	less than 1 min. per application
	Acidic Ferric Chloride	less than 1 min. per application
	25% Nitric Acid	less than 1 min. per application
	Acetone	less than 30 seconds
	Gun oil	not removed
VM3CZ8	MagnaFlux	
	Acid Etch Method	10 - 15 minutes
VP6ABZ	Acid Etch Method	5-minutes
VRA33D	Ferric Chloride	~5 minutes
	Nitric Acid	~5 minutes
	Ferric Chloride	~1 minute
	Nitric Acid	~5 minutes
VYBGNE	Electro-acid etching process	+/- 15 minutes
VZ68UT	Acid Etch Method	different acids, all in all about 15 minutes
W2F8QM	Acidic Ferric Chloride	10-15 seconds,
	Phosphoric /Nitric Acid (Step 1)	20 seconds
	Nitric Acid (Step 2)	20 seconds
	Acidic Ferric Chloride	10-15 seconds
	Phosphoric Acid/Nitric Acid (Step 1)	20 seconds
	Nitric Acid (Step 2)	20 seconds
W4LRF9	Acid Etch Method	not long apply, swipe, remove
W8L3AM	Acidic Ferric Chloride	several applications approx. 3 minutes each
WBJJMG	Fry's Reagent	1 min
	Acidic Ferric Chloride	1 min
	Acid Etch Method	15 mins

TABLE 4

WebCode	Method	Time
WCARLK	Acidic Ferric Chloride	10 seconds
	Ferric Chloride	10 seconds
	Ferric Chloride	20 seconds
	Ferric Chloride	30 seconds
	Ferric Chloride	30 seconds
WD8VN9	Acidic Ferric Chloride	Used over a span for 4 days
	Ferric Chloride	Used over a span for 4 days
	Fry's reagent	Used over a span for 4 days
WFA3HK	Ferric Chloride	30 mins
	Diluted 25% nitric acid	10 mins
WGAUYZ	Acidic Ferric Chloride	~25 min total restoration time
	Nitric Acid	
WL22EN	Acid Etch Method	Approximately three minutes total, in approximately one minute increments
WL79U3	Acidic Ferric Chloride	10 intervals of 15 seconds each
WQWTP7	Ferric Chloride	Not recorded. Estimated 1 to 3 minutes.
	Acidic Ferric Chloride	Not recorded. Estimated 1 to 3 minutes.
	Nitric Acid	Not recorded. Estimated 30 to 60 seconds.
WRRBR8	Acidic Ferric Chloride	Diluted with Ferric Chloride reagent 5 min.
	Ferric Chloride	
WTK8DF	Electro-acid etching process	+/- 15 minutes
WTMY7W	Ferric Chloride	10 seconds
	Acidic Ferric Chloride	10 seconds
	25% Nitric Acid	10seconds
WXJHC2	25% Nitric Acid	Less than 5 minutes
XA4J3R	Ferric Chloride	~10-15 seconds at a time over ~90 minutes
	25% Nitric Acid	~10-15 seconds at a time over ~5 minutes
XNM3Z3	sodium hydroxide	10 minutes
	ferric chloride	20 minutes

TABLE 4

WebCode	Method	Time
XQEYNW	Acidic Ferric Chloride	1 min
	Ferric Chloride	1 min
	10% Sodium Hydroxide	1 min
	Aluminum Solution	30 sec
	Acidic Ferric Chloride	3 min
	10% Sodium Hydroxide	5 min
	Solution #2	2 min
Y8DM7L	Acid Etch	have to remove the acid with cotton wool
Y96TC4	Modified Frys Reagent	1 min
	Nickels & Alloys Reagent	1 min
YBWP2X	Acid Etch Method	c. 3 minutes
	Acid Etch Method	c. 30 seconds
YKDLTH	Acidic Ferric Chloride	5 minutes
	Acidic Ferric Chloride	2 minutes
	Nitric Acid	1 minute
	10% Sodium Hyrdoxide	2 to 3 minutes
	Nitric Acid	1 to 2 minutes
YKNYU2	Turner's Reagent	30 minutes total
YMPC8T	MagnaFlux	
	Acid Etch Method	one minute
YXBFER	Acidic Ferric Chloride	less than a minute
	25% Nitric Acid	less than a minute
	Phosphoric Nitric Acid	less than a minute
Z9JKYT	Ferric Chloride	30 minutes
	10% Sodium Hydroxide	30 minutes
	25% Nitric Acid	45 minutes
ZAXZG2	Acidic Ferric chloride	~5 minutes
	25% Nitric Acid	~10 minutes
ZDHU9V	Solution A	Used multiple times for between 1-30 sec.
	Fry's Reagent	Used multiple times, but only 1-5 sec. at a time
	10% Sodium Hydroxide	Used multiple times fro[sic] between 1-30 sec.
	Acidic Ferric Chloride	Used once for 1-5 sec.
ZE9ZPL	Acidic Ferric Chloride	5 times for 5-10 seconds

TABLE 4

WebCode	Method	Time
ZJMXW9	Acidic Ferric Chloride	20 swabs
ZL47ZE		
ZX3V4U	Acid Etch Method	seconds to several minutes, depending on acid used
ZYVNYD	Acid Etch Method	Total minutes:
	Ferric Chloride	15 minutes
	Acidic Ferric Chloride	25 minutes
ZZWCN4	Acid Etch Method	30 - 40 mins

Response Summary		Participants: 302
Recovery Methods		
Chemical Processing:	276	
Magnetic Processing:	15	
None:	1	

Additional Comments

TABLE 5

WebCode	Additional Comments
26JQKN	Initially tried two other acid etching methods which did not produce any numbers or characters. Then was successful with the Phosphoric/Nitric followed by 25% Nitric acid with some rubbing of the etched surface with a cotton swab moistened with the 25% Nitric acid solution. Initial attempts were: 1. Phosphoric acid 2 minutes then 5% Nitric Acid. Obliterated surface was re-polished after this attempt. 2. Ferric Chloride diluted to approximately 50% allowed to etch for approximately 2 minutes. Neither of the first two methods produced any visible numbers.
2B8DD9	If polishing was done it must be indicated.
2ZQHH3	Note to quality and CTS teams: I disagree that the test sample (to be restored) has the type of material on the envelope. IE: "ZINC BAR STOCK". As experts we should be able to identify the type of material (ferrous or non ferrous), we actually have a method (M7 V1) for telling the difference in materials which we need to do before we commence a Forensic restoration.
32BX2A	The surface was sanded until it was mirror-like. The sequence was available to watch with the ferric chloride, the other recovery methods were used for confirm the "J" and the "4".
33R6BX	The obliteration was very deep. A shallower obliteration would be appreciated.
3RTGBN	Photographs taken prior to beginning, throughout, and after completion of the examination.
4LE34A	The piece of aluminum bar stock submitted, was included as a reference for size, shape and positioning of the stamped alphanumeric characters used in the obliterated serial number in the zinc bar stock, described in the Item 1.
4R2QYE	D7 27, D7)274, D7J274. The Sample 1 was photographed and packaged for submission upon completion.
6HCJJM	The method "Serial Number Restoration" is accredited according to ISO 17025.
6TVUJY	The aluminum bar stock with stamped structure guide and Item 1 (Zinc bar stock with obliterated/restored serial number) were returned to their original envelopes and will be retained in the Firearms Section of the Lab.
88QYAA	The visual examination of the item revealed the presence of filing marks on the centre of the bar.
8XYGXM	The number in third position could not be completely resolved. It appeared that one side of the numeral was not as deeply impressed in the bar stock as the remaining numerals in the serial number.
96T7RW	In casework, there is no standard to use as a guide. There is no need to include the Aluminum Standard.
9E3B6M	running water to stop process at each step of analysis sample preparation pictures[sic] were taken
9Q3Y6W	High Zinc content made it difficult to view the restored characters due to the Zinc reaction with the reagent (HCL) used. The [Laboratory] cast surfaces prior to destructive testing, ie the use of Reprosil to capture tool marks, partial characters etc, prior to chemical etching. The test would not allow for the addition of that particular methodology from the drop down box.

TABLE 5

WebCode	Additional Comments
ACA28Q	The serial number was very thin.
AXBZT4	The area with obliterated characters in Item 1 was removed with the use of milling method. The material of Item 1 is paramagnetic.
BWCAZU	I would have made a cast of the tool marks had this been an actual case.
BWXQFX	Item 1A: zinc bar stock. Item 1B: aluminum standard plate.
CAV438	A digital images was captured after recovery of the obliterated serial No.
DHNT8E	After restoration, the area was cleaned with water and swabbed with gun oil.
DRF6JV	I used the method above numerous times to try and retrieve the serial number.
E7QG4Z	10% NaOH used for the last 5 minutes of acid etching.
EQU347	After chemical processing the surface was rinsed with water. A small amount of oil was then placed on the surface in order to prevent further reaction.
ERB8L6	Initial polishing with a Dremel and Flitz polishing compound was done lightly and only to remove the apparent milling marks. After a few initial applications of reagents to the serial number area, some vague characters appeared. The location of six characters could be determined, with POSSIBLE characters identified as either "B _ _ 2 7 4" or "8 _ _ 2 7 4". Due to insufficient clarity, the legibility of these characters never reached a threshold that would be considered reportable. The possible "4" remained the most persistent, as the other characters would fade and reappear at various times in the process. Additional polishing was performed only to clean the surface of oxidation in order to minimize the amount of material removed. Less aggressive acid etching techniques (25% nitric acid) and electrolytic techniques employing 10% sodium hydroxide provided the best treatment results. Griffin's reagent appeared overly aggressive, as did Fry's (which was only briefly applied).
F4JCCX	A magnet used to determine if the piece of metal received for analysis it is magnetic or not, to determinate what restoration methodology used.
FR6CHP	A cast was made of the toolmarks on Exhibit 1 and marked 1T1.
FTX96X	A piece of aluminum bar stock submitted, was used as a reference standard.
FV4TTX	The obliterated serial number was restored with phosphoric/nitric acid and 25% nitric acid.
GBXHLA	Cotton swabs seem to be detrimental to restoration effort. Only by allowing the Nitric Acid to pool would characters begin to restore. Characters were difficult to observe when bar stock was dry; final determination of characters restored were done with Nitric Acid puddled on the restored area. Swab almost removed restored characters entirely at this point.
GCAAGC	Prior to restoration attempt it was clear that one area was ground down in a very uniform width and depth. With the naked eye, and at the right angle I could see the area that I believed to have had the serial number. Using the Dremel tool with a jeweler's polishing wheel, I polished the area smooth. Soon after the application of 25% Nitric Acid and Phosphoric Acid (2 step) the serial number was observed.
GF7XVX	Recovery method used during examination: acidic method non ferric

TABLE 5

WebCode	Additional Comments
GJAW7Q	Sanding done by hand until obliterated area was smooth to the touch. No numbers were visible after sanding. Fry's was diluted down to 25%. Application of the acids was done slowly with a pause between each application to watch for the appearance of numbers. No numbers appeared.
H24RGT	The aluminium bar stock used as the reference to be the same material, zinc bar stock, as the exhibit submitted, if possible. A second reference bar from which metal could be removed to reproduce the action that occur on the exhibit bar stock, in this occurrence. After the acid etching, drops of oil were pored on the area of the retrieved characters to assist with the visible confirmation of the retrieved number under the desk-lamp magnifier.
J46GW8	The item 1 was first given to department of physics in order to verify the CTS information about the material composition. Examinations via scanning-electron-microscope confirmed that item 1 consists of a zinc-aluminum alloy (Content: 96 percent zinc and 4 percent aluminum). Little experience in serial number restoration with stamped characters in almost pure zinc led us to do some experiments. For this purpose we cut off an irrelevant piece of the zinc bar stock and put some stamped characters into its surface. Then the surface was grinded until the characters disappeared. After grinding and polishing the surface again, an acid method was selected by using different reagents for example "NaOH", "Alu1", "Alu2" und "hydrochloric acid". The restoration only succeeded with hydrochloric acid. Afterwards the relevant area of item 1's surface was treated in the same way (grinding-> polishing-> chemical etching-> record). Using the aluminum bar as a reference for size, shape and positioning of the stamped alphanumeric characters used in the serial number was very helpful. The obliterated serial number appeared weakly as D 7 J 2 7 4.
J7FAYL	This was a particularly easy restoration. The characters appeared very quickly after application of chemicals. It appears that the characters were stamped deeply, however a relatively small amount of material was milled away.
JEQCKM	The zinc metal substrate was an unusual one which this laboratory had not encountered before. The reagents used were not previously utilised by this laboratory, this possibly resulting in the incomplete recovery.
JLLHTU	This time Zn was used for bar. No magnetic restoration is allowed (diamagnetic)
JYWTKQ	Photographs of the serial number recovery were taken and will be retained in the firearms section of the laboratory.
K3K6MZ	I HAD NOT ATTEMPTED TO RESTORE A NUMBER ON ZINC ALLOY PREVIOUSLY TO THIS. THE COPPER CHLORIDE HAD A NEGATIVE EFFECT AFTER APPLICATION AND I DECIDED 25% NITRIC ACID WOULD BE A MORE RELIABLE ALTERNATIVE.
KCV792	Initially used cupric chloride in nitric acid solution but this was ineffective. Progressed to 25% nitric acid which successfully restored serial number.
KZLGFQ	The obliteration of the zinc bar was too deep. During electro-acid etching process no slight indication of any number or figure was visible.
L4HKM4	We usually use a sanding method to smoothen the surface, but it didn't appear necessary in that case. We used the NaOH and HNO3 solutions alternatively, until the number was fully recovered.
LGPBMQ	If the sample is already polished & sand it must be mentioned to the participants to avoid

TABLE 5

WebCode	Additional Comments
	over sanding that can erase more numbers before the etching process is being applied.
LV92K8	I alternated using all three chemicals for 45 minutes total.
LVJZG3	SEALED PAPER ENVELOPE ORANGE WITH RED TAPE "EVIDENCE" WITH STIKER WHITE JOINED WITH THE INSCRIPTION "2016 CTS FORENSIC TESTING PROGRAM" TEST N° 16-5250: SERIAL NUMBER RESTORATION" "SIMPLE PACK : SNR1" AND INSIDE WHICH ARE TWO (2) ON ORANGE PAPER ONE WITH THE METAL PLATE (TEST N° 16-5250 ITEM 1 ZINC BAR STOCK) AND ON (ALUMINUM STANDARD TEST N° 16-5250) WITH A PLAQUE WITH THE FOLLOWING CHARACTERISTICS PRINTED "ABCDEFHJKL 1234567890"
M8UVBR	After the apply the Fry's reagent in the superficie and wash with water, was applied by 1 minute a NaOH 13.5% m/v, finally wash with water against.
MD7UTC	For this restoration at first I tried polishing with a Dremel type tool and using MagnaFlux but I did not see anything. Even though the bar was non-ferrous I wanted to try a non-destructive method first. During chemical processing I used Acidic Ferric Chloride twice then polished with the Dremel type tool, and then repeated that cycle two times. After each time I would visually inspect the bar and saw no characters. I then tried 25% Nitric Acid, this seemed a little strong so I polished and went back to Acidic Ferric Chloride. After two more rounds of Acidic Ferric Chloride and polishing I used Sodium Hydroxide and saw no characters. I polished the zinc metal bar again and then used Acidic Ferric Chloride and allowed it to sit for three hours. After three hours I saw the characters "D 7 J 2 7 4".
MGHQB8	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.
MVZCY8	Progress on restoration was not from any one chemical. A combination of the acids restored the number.
MZYPKC	Once the restoration was complete, I applied acetone and rig lubricant to the area to preserve. The first character restored is an alpha character "D" followed by a numeric "7" alpha "J" and numerics "2" "7" "4".
N6MWFP	The aluminum bar stock described in the item 2, was used for Standard reference, for size, shape and positioning of the stamped alphanumeric characters used in the serial number for the zinc bar stock, described in the item 1.
NFJZJJ	The reagent was applied using a cotton swab and a side to side motion for approximately ten seconds at a time. The acid was wiped off and then reapplied using the same method. This was repeated for a duration of approximately 45 minutes.
NWTRK3	After application of Ferric Chloride, Nitric Acid 25% was applied and alternated with Ferric Chloride. After the serial number was restored and restoration was complete, deionized water

TABLE 5

WebCode	Additional Comments
	and then gun oil were applied to the restoration area.
PP8ZPV	The number was unable to be restored.
Q9XLV4	The sample was cleaned with water.
RKPVUW	Phosphoric/Nitric combo worked first time.
RL43FE	Recovered characters faded quickly, and offered poor contrast for photo documentation. Nitric Acid was applied for highlighting efforts, but rendered much worse results.
RNQRLD	10% Sodium Hydroxide was suggested for zinc alloy and was applied however it did not have a visible reaction with the polished surface and no hint of the digits were visualised. The surface was washed with water, dried and repolished, then 10% Nitric Acid (also suggested for zinc) was used with good result to recover the serial number. Out of interest, Fry's Reagent was then applied after the surface was cleaned and repolished. There was a very aggressive reaction on the metal surface and turned it immediately black. This was washed off, the area repolished and 10% Nitric Acid reapplied which confirmed the serial number, a little clearer than before.
RPG3C7	When conducting the analysis, the last 3 numbers became visible quickly (within 2 minutes) and remained clearly visible, followed by the second number, then the first. Both the first and second numbers were never really as clear or as visible as the last three and I could never really see the middle number during the test, only faint possible outlines.
TC8L4F	Since the test did not give an idea of what type of digits (alpha or numeric) were in each space, I did not feel comfortable calling the third placement. I believe it to be a J but since the manufacturer did not notify describe the character designations, I could not be certain. The advantage to actual SNR, is more often than not, you as an analyst understand what the character placement will be, based on manufacturer specs.
TXN2G2	PARTIAL RESTORATION OF SERIAL NUMBER ???274. POSSIBLE SERIAL NUMBERS ARE: 071274, 075274.
UDWAYF	My observation: there was no need for one to do polishing and sanding. It was already done. Because its could disturb good results of one's etching. That information could have been stated on the report.
UP7YQP	The presence of alpha-numeric figures could be detected but can't be read with the surity required. The finding is negative as it can not be inconclusive.
UZNR37	[From Table 4 - Recovery Methods: Time - "These are approximate times"]
VM3CZ8	The metal has a defect in the area of the third character which obscures the top of the character. Due to this defect, the third character could not be recovered.
VYBGNE	The exhibit must not be polished too hard. The results cannot be obtained.
VZ68UT	After smoothening the surface softly with sand paper we rubbed the surface with acid saturated cotton swabs. The difficulty to reconstruct the serial number of this Zinc bar stock was comparable with the steel bar stocks the years before.
W2F8QM	Cotton swabs used in a rubbing motion while chemicals were applied to item 1.

TABLE 5

WebCode	Additional Comments
WBJJMG	Successful chemical etching used was by alternating between two solutions over a 15 minute time period: Solution 1: 2% Nitric Acid / 98% Phosphoric Acid. Solution 2: 5% Nitric Acid solution.
WTK8DF	Polishing and sanding is not necessary for this item, it could influence the results.
WTMY7W	Exhibit #1a was not examined.
XQEYNW	Serial # restored using chemical etching process.
YKNYU2	The quality of this test was poorly executed. In the first batch, the number was only partially recoverable after 2 days. The second one received had a very rough surface from the machining and had to be ground down quite a bit before the restoration process could begin.
ZVNYD	The aluminum bar stock, was included as a reference for size, shape and positioning of the stamped alphanumeric characters used in the serial number of the zinc bar stock described in item 1.

Appendix: Data Sheet

Collaborative Testing Services ~ Forensic Testing Program

Test No. 16-5250: Serial Number Restoration

DATA MUST BE RECEIVED BY April 18, 2016 TO BE INCLUDED IN THE REPORT

Participant Code:

Webcode:

Accreditation Release Statement

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

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

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 zinc bar stock with suspected obliterated serial number.

1.) Please record the restored characters below.

The serial number on this material consists of 6 characters.

Item 1: _____

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

Please 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

Return Instructions: Data must be received via online data entry, fax (please include a cover sheet), or mail by **April 18, 2016** 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
www.ctsforensics.com

Participant Code:

ONLINE DATA ENTRY: www.cts-portal.com

FAX: +1-571-434-1937

MAIL: Collaborative Testing Services, Inc.
P.O. Box 650820
Sterling, VA 20165-0820 USA

Please return all pages of this data sheet.

RELEASE OF DATA TO ACCREDITATION BODIES

The following Accreditation Releases will apply only to:

Participant Code:

Webcode:

for Test No. **16-5250: Serial Number Restoration**

This release page must be completed and received by **April 18, 2016** to have this participant's submitted data included in the reports forwarded to the respective Accreditation Bodies.

ASCLD/LAB RELEASE

If your lab has been accredited by ASCLD/LAB and you are submitting this data as part of their external proficiency test requirements, have the laboratory's designated individual complete the following.

The information below must be completed in its entirety for the results to be submitted to ASCLD/LAB.

ASCLD/LAB Legacy Certificate No. _____ ASCLD/LAB International Certificate No. _____

Signature _____ Date _____

Laboratory Name _____

Location (City/State) _____

ANAB RELEASE

If your laboratory maintains its accreditation through ANAB, please complete the following form in its entirety to have your results forwarded.

ANAB Certificate No. _____

Signature and Title _____ Date _____

Laboratory Name _____

Location (City/State) _____

Return Instructions

Accreditation Release

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

*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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