



## Serial Number Restoration Test No. 14-5251 Summary Report

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This test was sent to 212 participants. Each participant received a sample pack containing a piece of stainless steel bar stock which had been stamped with a six character serial number which was then obliterated. Also included was a piece of aluminum bar stock intended as a standard for the size, shape and positioning of the stamped characters. Participants were asked to restore the obliterated serial number. Data were returned from 174 participants (82% 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 stainless steel bar stock that contained an obliterated serial number (Item 1) and a piece of aluminum bar stock intended as a standard for the size, shape, and positioning of the stamped digits. Participants were requested to attempt to restore the obliterated serial number utilizing their laboratory restoration methodologies and report the recovered serial number. The serial number to be restored consisted of 6 characters (A3K9N3).

## **SAMPLE PREPARATION-**

Each sample set contained a piece of 1" x 1/4" x 2.5" stainless steel bar stock that was stamped using a punch press. The stamp consisted of 6 characters (A3K9N3) 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 "A3K9N3". 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 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 (A3K9N3). (Refer to Manufacturer's Information for preparation details.)

Of the 174 responding participants in Table 1: "Recovered Characters", 172 (99%) recovered the six digits consistent with the Manufacturer's Information. One participant recovered 1 character different from the consensus response. One participant did not report any restored characters, but in their conclusion stated "could not be restored".

Of the 174 responding participants in Table 4: "Recovery Methods", 110 used only chemical processing, 47 used only magnetic processing and 17 participants reported using combined magnetic and chemical processing for the serial number restoration.

# Recovered Characters

Please record the restored characters below.

TABLE 1

WebCode	Character1	Character2	Character3	Character4	Character5	Character6
22MGPV	A	3	K	9	N	3
2D7RPG	A	3	K	9	N	3
2GPZVV	A	3	K	9	N	3
2L2R3N	A	3	K	9	N	3
2NAXL4	A	3	K	9	N	3
2PJ6NW	A	3	K	9	N	3
2R843K	A	3	K	9	N	3
2URC67	A	3	K	9	N	3
33K6TK	A	3	K	9	N	3
34ADXL	A	3	K	9	N	3
37FXLL	A	3	K	9	N	3
38AJGX	A	3	K	9	N	3
3C8J2M	A	3	K	9	N	3
3NZKEP	A	3	K	9	N	3
43LK9W	A	3	K	9	N	3
49YCPL	A	3	K	9	N	3
4B7RZY	A	3	K	9	N	3
4CKVBM	A	3	K	9	N	3
4HER2Y	A	3	K	9	N	3
63F8XF	A	3	K	9	N	3
69C76L	A	3	K	9	N	3
6B9XMM	A	3	K	9	N	3
6CD886	A	3	K	9	N	3
6GAT2T	A	3	K	9	N	3
6HPAD3	A	3	K	9	N	3
6MVT9T	A	3	K	9	N	3
6W2XXN	A	3	K	9	N	3
6XYZC2						
6YX2KE	A	3	K	9	N	3

TABLE 1

<b>WebCode</b>	<b>Character1</b>	<b>Character2</b>	<b>Character3</b>	<b>Character4</b>	<b>Character5</b>	<b>Character6</b>
7ACYNE	A	3	K	9	N	3
7CQ34W	A	3	K	9	N	3
7K9NG4	A	3	K	9	N	3
7NTZHK	A	3	K	9	N	3
7W7JGJ	A	3	K	9	N	3
8AMLTG	A	3	K	9	N	3
8CB9AB	A	3	K	9	N	3
8EHD3Y	A	3	K	9	N	3
8WKWKD	A	3	K	9	N	3
8X4FAP	A	3	K	9	N	3
96LXB4	A	3	K	9	N	3
9A2MYF	A	3	K	9	N	3
9BW7XV	A	3	K	9	N	3
9CMBAL	A	3	K	9	N	3
9H8FXF	A	3	K	9	N	3
9JQBRW	A	3	K	9	N	3
9M6Y2Y	A	3	K	9	N	3
A9H68K	A	3	K	9	N	3
AB8HP4	A	3	K	9	N	3
AC9PHJ	A	3	K	9	N	3
ACEVBB	A	3	K	9	N	3
BJAADN	A	3	K	9	N	3
BNM3KG	A	3	K	9	N	3
BQKZPD	A	3	K	9	N	3
BZH7QV	A	3	K	9	N	3
C9BYHL	A	3	K	9	N	3
CAMD9G	A	3	K	9	N	3
CCHDWF	A	3	K	9	N	3
CRWLWJ	A	3	K	9	N	3
CYB8EV	A	3	K	9	N	3
DE8ZCK	A	3	K	9	N	3
DEHLAY	A	3	K	9	N	3

TABLE 1

<b>WebCode</b>	<b>Character1</b>	<b>Character2</b>	<b>Character3</b>	<b>Character4</b>	<b>Character5</b>	<b>Character6</b>
DX79EQ	A	3	K	9	N	3
E6ABKK	A	3	K	9	N	3
ECGBB6	A	3	K	9	N	3
EH39VL	A	3	K	9	N	3
EPFNC8	A	3	K	9	N	3
EPWKLC	A	3	K	9	N	3
ETCBMD	A	3	K	9	N	3
EWGW29	A	3	K	9	N	3
EWZ3YD	A	3	K	9	N	3
EX9YL3	A	3	K	9	N	3
EXNFGV	A	3	K	9	N	3
EYMGP9	A	3	K	9	N	3
F32DTP	A	3	K	9	N	3
FB3BM9	A	3	K	9	N	3
FGV7TM	A	3	K	9	N	3
FKJXT	A	3	K	9	N	3
FQDRUB	A	3	K	9	N	3
FUMPV2	A	3	K	9	N	3
G2TYCW	A	3	K	9	N	3
G2ZMY6	A	3	K	9	N	3
GNZLKJ	A	3	K	9	N	3
GVXRFF	A	3	K	9	N	3
GYLLMH	A	3	K	9	N	3
HE6KEY	A	3	K	9	N	3
HPVKLY	A	3	K	9	N	3
HU2TG8	A	3	K	9	N	3
J79M92	A	3	K	9	N	3
JBBHKL	A	3	K	9	N	3
JTV46C	A	3	K	9	N	3
JYEC3	A	3	K	9	N	3
JZJL8X	A	3	K	9	N	3
JZZPVX	A	3	K	9	N	3

TABLE 1

<b>WebCode</b>	<b>Character1</b>	<b>Character2</b>	<b>Character3</b>	<b>Character4</b>	<b>Character5</b>	<b>Character6</b>
K7LUAJ	A	3	K	9	N	3
KF8Z3G	A	3	K	9	N	3
KL7X2B	A	3	K	9	N	3
KTE7WF	A	3	K	9	N	3
LU6PE8	A	3	K	9	N	3
M46KPE	A	3	K	9	N	3
ME3NRM	A	3	K	9	N	3
MFZPZZ	A	3	K	9	N	3
MKGK4C	A	3	K	9	N	3
MLMN8Z	A	3	K	9	N	3
MR8Q9B	A	3	K	9	N	3
MURTXV	A	3	K	9	N	3
MWZQM7	A	3	K	9	N	3
MYJ6Q8	A	3	K	9	N	3
N2TA6V	A	3	K	9	N	3
NANEXW	A	3	K	9	N	3
NBN7DL	A	3	K	9	N	3
NCXYAY	A	3	K	9	N	3
NHPGNK	A	3	K	9	N	3
NZ4TJW	A	3	K	9	N	3
P292JX	A	3	K	9	N	3
PAK42M	A	3	K	9	N	3
PGC8DY	A	3	K	9	N	3
PNT64X	A	3	K	9	N	3
Q2DJKC	A	3	K	9	N	3
Q7HM2X	A	3	K	9	N	3
QFCQD8	A	3	K	9	N	3
QHA7LZ	A	3	K	9	N	3
QKKUHN	A	3	K	9	N	3
QMC62U	A	3	K	9	N	3
QNTMNA	A	3	K	9	N	3
QPUCEV	A	3	K	9	N	3

TABLE 1

<u>WebCode</u>	<u>Character1</u>	<u>Character2</u>	<u>Character3</u>	<u>Character4</u>	<u>Character5</u>	<u>Character6</u>
QRMMHZ	A	3	K	9	N	3
QX3R2Z	A	3	K	9	N	3
QYG8F2	A	3	K	9	N	3
QZBZBK	A	3	K	9	N	3
RCGNKU	A	3	K	9	N	3
RET2PK	A	3	K	9	N	3
RGRPGX	A	3	K	9	N	3
RMQUZZ	A	3	K	9	N	3
RVRFU	A	3	K	9	N	3
RYTJCX	A	3	K	9	N	3
T22YFR	A	3	K	9	N	3
T9V8LL	A	3	K	9	N	3
TM63MY	A	3	K	9	N	3
TUMDZZ	A	3	K	9	N	3
TVUB3P	A	3	K	9	N	3
TWTVYV	A	3	K	9	N	3
TXVH4K	A	3	K	9	N	3
UMKNW2	A	3	K	9	N	3
UXJR3P	A	3	K	9	N	3
V3FEJL	A	3	K	9	N	3
VBWTQX	A	3	K	9	N	3
VKFC2G	A	3	K	9	N	3
VLXEV6	A	3	K	9	N	3
VNDRA6	A	3	K	9	N	3
VQE2WV	A	3	K	9	N	3
VUADM2	A	3	K	9	N	3
VWL7M4	A	3	8	9	N	3
VWW4EX	A	3	K	9	N	3
WPD2AB	A	3	K	9	N	3
WPHJAU	A	3	K	9	N	3
WVLHKK	A	3	K	9	N	3
X982VF	A	3	K	9	N	3



TABLE 1

<b>WebCode</b>	<b>Character1</b>	<b>Character2</b>	<b>Character3</b>	<b>Character4</b>	<b>Character5</b>	<b>Character6</b>
XAYBNG	A	3	K	9	N	3
XG28NG	A	3	K	9	N	3
XGGL2H	A	3	K	9	N	3
XRENYQ	A	3	K	9	N	3
XUNGC8	A	3	K	9	N	3
XYKK9Q	A	3	K	9	N	3
XZHPAP	A	3	K	9	N	3
YAX66R	A	3	K	9	N	3
YB2LUM	A	3	K	9	N	3
YFZYVM	A	3	K	9	N	3
YQTEJU	A	3	K	9	N	3
YQUDBG	A	3	K	9	N	3
YTL8ED	A	3	K	9	N	3
YXDGLQ	A	3	K	9	N	3
YY83G3	A	3	K	9	N	3
ZMHJHZ	A	3	K	9	N	3
ZTDREH	A	3	K	9	N	3

<b>Response Summary</b>						<b>Participants: 174</b>
	<b>Character1</b>	<b>Character2</b>	<b>Character3</b>	<b>Character4</b>	<b>Character5</b>	<b>Character6</b>
Consensus	A	3	K	9	N	3
Number	173	173	172	173	173	173
Percent	99.4%	99.4%	98.9%	99.4%	99.4%	99.4%

# Conclusions

TABLE 2

WebCode	Conclusions
22MGPV	Standard restoration techniques applied to Item 1 revealed the following characters: A3K9N3.
2D7RPG	After application of the electro-magnetic process, I found the number of the stainless steel to be A3K9N3.
2GPZVW	After application of the electro-acid etching process, I determined the serial number of the exhibit as A3K9N3.
2L2R3N	After application of the electro-magnetic process, I determined the serial number of the stainless steel bar stock to be the following numbers A3K9N3.
2NAXL4	Chemical treatment was successful in chemically restoring a serial number on the bar. The serial number on the bar was restored to read A 3 K 9 N 3.
2PJ6NW	After application of the electro-acid etching process, I determined serial number A3K9N3 on the stainless steel bar.
2R843K	Physical, magnetic, and chemical processing of the obliterated area on the bar stock, using standard laboratory procedures for restoring characters stamped in metal have been performed on the submitted metal plate. The stamped series of characters revealed is "A3K9N3".
2URC67	On 9-23-2014, I obtained proficiency test #14-5251 from the Crime Lab Quality Assurance Coordinator for serial number proficiency testing. From Proficiency Test #14-5251: Item 1: One (1) Aluminum[sic] Bar Stock with the middle area containing suspected serial number obliterated. Results: Restored serial number for Item 1 is: A3K9N3. Item 1 will be returned to the Crime Lab Quality Assurance Coordinator. I hereby certify that this is a report of the conclusions of an examination performed by me.
33K6TK	After application of the electro-magnetic process, I determined the serial number of the steel bar as A3K9N3.
34ADXL	Sub #001-1 was examined and photographed before polishing the obliterated area with a dremel tool. Physical and chemical methods were applied to the polished surface in an attempt to restore the serial number. The restoration techniques were able to produce a discernable serial number: A3K9N3.
37FXLL	Sub #1-1 was examined and found to be stainless steel bar stock with an obliterated serial number. Sub #1-2 was examined and found to be an aluminum bar stock with known standards of the serial number structure. Serial number restoration of Sub #1-1 was performed. The restored serial number of Sub #1-1 is "A3K9N3".
38AJGX	Examinations showed the serial number of Item 1 to be obliterated. The serial number of Item 1 was restored using magnetic particle restoration techniques and was found to be: A3K9N3.
3C8J2M	The serial number of the metal bar is A3K9N3.
3NZKEP	The serial number on Item 1 was restored and reads A3K9N3.

TABLE 2

WebCode	Conclusions
43LK9W	Item 1 - A serial number restoration process was undertaken on the region of interest utilising visual examination and chemical treatment techniques. This process revealed a six (6) alphanumeric character series observed to be "A3K9N3".
49YCPL	The bar stock was not examined further. Through standard techniques the serial number was restored to read A3K9N3.
4B7RZY	Exhibit 1 (Item 1) - One piece of stainless steel bar stock with an obliterated serial number. The serial number was chemically restored to be: A3K9N3.
4CKVBM	After application of the electro-magnetic process, I determined the serial number of the stainless steel bar stock to be the following numbers A3K9N3.
4HER2Y	The examination and chemical processing of the item, revealed a full serial number, with sufficient characteristics to allow the Examiner to make a positive identification. The number recovered are as follows, A3K9N3.
63F8XF	After application of the electro-magnetic process, I determined the serial number of the piece[sic] of stainless steel bar stock as A3K9N3.
69C76L	A serial number restoration was performed on Laboratory Item # 001.A (14-5251) piece of stainless steel bar stock with a suspected obliterated serial number. The serial number was fully restored and appeared to be A3K9N3.
6B9XMM	By Magnetic restoration we found A3K9N3, in accordance with aluminum pattern.
6CD886	Acid etching chemicals were used to restore the obliterated serial number. The serial number was restored as A3K9N3.
6GAT2T	Item1 : One piece of stainless steel bar stock with suspected obliterated serial number. RESULTS: Item 1 was physically and microscopically examined. The obliterated area of Item 1 was prepared, and chemically treated with restoration reagents. The original obliterated number was restored to read "A3K9N3".
6HPAD3	Through the serial number restoration process, the following was determined[sic]: 1. The serial number of the stainless steel bar stock, described in item 1 was restored and correspond to: A3K9N3.
6MVT9T	The restored serial number on the exhibit Item 1 is A3K9N3.
6W2XXN	The serial number on the Item 1 block was physically and chemically treated. The serial number was restored to read "A3K9N3".
6XYZC2	The obliterated serial number could not be restored.
6YX2KE	3. On 2014-10-17 during the performance of my official duties I received a sealed evidence bag with number PAD000580212 from Case Administration of the Ballistics Section, containing the following exhibit: 3.1 One (1) piece of stainless steel bar stock with suspected obliterated serial number marked by me "201668/14". 4. The intention and scope of this

TABLE 2

WebCode	Conclusions
	forensic examination comprise of the following: 4.1 Techniques associated with the recovering and restoration processes of obliterated alpha-numeric figures on metals. 5. After application of the electro-magnetic process, I determined the serial number as A3K9N3.
7ACYNE	After application of the magnetic particle method, we determined the serial number of stainless steel bar stock as A3K9N3.
7CQ34W	The obliterated serial number on Item 1 was restored to read A3K9N3.
7K9NG4	Examination of the surface of the stainless bar revealed evidence of an obliterated serial number. The surface was treated and the following characters restored: A3K9N3.
7NTZHK	The serial number on Agency Exhibit 1 was determined to be A3K9N3. Agency Exhibit 2 was used for reference purposes only, and was not subjected to serial number restoration.
7W7JGJ	After the application of the electro magnetic process I found numbers and letters A3K9N3 on the stainless steel bar mentioned in 3.1.
8AMLTG	After application of the electro-magnetic process, I determined the serial number of the stainless steel bar stock as A3K9N3.
8CB9AB	1. On 2014-10-24 during the performance of my official duties I received a sealed evidence bag with number PAD000586482 from Case Administration of the Ballistics Section, containing the following exhibits: 1.1 Two (2) pieces of metal marked by me "210707/14A" and "210707/14B" respectively. 2. The intention and scope of this forensic examination comprise the following: 2.1 Techniques associated with the recovering and restoration process of obliterated alpha-numeric figures on metals. 3. After application of the electro-magnetic process I determined the alpha numeric figures on the metal mentioned in paragraph 1.1 marked "201707/14A" as A3K9N3.
8EHD3Y	The serial number of Item 1 was restored to read "A3K9N3".
8WKWKD	After application of magnetic and chemical methods could reveal the identifying serial of the piece, wich[sic] corresponds to: A3K9N3.
8X4FAP	Examination of Item 1 revealed a possible obliteration area. Standard restoration techniques revealed the following characters on Item 1: A3K9N3
96LXB4	The serial number was sucessfully[sic] recovered. The serial number was found to be A3K9N3.
9A2MYF	After application of electro-magnetic etching process, I found the serial number A3K9N3 on the middle part of the the[sic] piece of stainless steel bar stock.
9BW7XV	Item #1 serial number, A3K9N3, fully restored using the Magnaflux process.
9CMBAL	Using standard laboratory restoration techniques, the obliterated serial number on Item 1 was restored to read "A 3 K 9 N 3".
9H8FXF	One (1) peice[sic] of aluminum measuring 2 3/4" x 1" with abrasions in center of it. Serial

TABLE 2

WebCode	Conclusions
	#A3K9N3 restored through the chemical etching process.
9JQBRW	Through the serial number restoration process the following was determined[sic]: The serial number of the stainless steel bar stock described in the item 1, was restored and correspond to: A3K9N3.
9M6Y2Y	The obliterated area on the piece of stainless steel bar stick in Item 1 was chemically etched and the serial number was determined to be A3K9N3.
A9H68K	Using standard laboratory restoration techniques, the obliterated serial number on Item #1 was restored to read: A 3 K 9 N 3.
AB8HP4	Serial Number: Attempts to restore the obliterated serial number of Item 1 was successful. The restored serial number is A3K9N3.
AC9PHJ	Prepared the surface of Item 1 applies nondestructive method of MagnaFlux and obtain alphanumeric characters A3K9N3.[sic]
ACEVBB	Examination of the submitted Item 1 found the manufacturer's serial number to have been obliterated. Physical and magnetic processing of the submitted Item 1 restored the obliterated, original serial number to read "A3K9N3".
BJAADN	The serial number area of Item 1 was prepared and treated with various chemical reagents. As a result of these actions, the serial number was restored to legible condition and was A3K9N3.
BNM3KG	Submitted: One (1) block of silver non-ferrous metal measuring approximately 2¾" x 1" x ¼" displaying a 1" x 1" area milled away. Serial # A3K9N3 recovered with chemical etching. Item marked [Participant Code], 14-5251 for Identification.
BQKZPD	After application of the electro-acid etching process, I determined the obliterated number on the metal plate as A3K9N3.
BZH7QV	The section of steel bar was examined when it was noted that an area of this bar had been altered. This was likely the area where a serial number was present, but was no longer visible. An attempt was made to recover the number using surface preparation, Magnaflux followed by chemical etching (Fry's reagent). The serial number was identified as being A3K9N3.
C9BYHL	Item 1 was physically and microscopically examined. The serial number area was prepared and treated with restoration reagents and the following characters were recovered: A3K9N3
CAMD9G	The serial number was determined to be: A 3 K 9 N 3
CCHDWF	The obliterated serial number on the piece of stainless steel bar stock (Item 1) was restored as A3K9N3.
CRWLWJ	Using a serial[sic] number restoration technique, "Magnaflux" the obliterated characters were identified as A3K9N3. After cleaning the surface were[sic] used Fry's reagent with the same results above [Table 1- Recovered Characters].
CYB8EV	On examination, I found the plate has been filed and bears no number. Upon

TABLE 2

WebCode	Conclusions
	electrochemical treatment on the filed region, i developed number "A3K9N3".
DE8ZCK	The obliterated serial number on Item 1 was restored to read A3K9N3.
DEHLAY	After application of the electro-acid etching process, I determined the serial number of the stainless steel bar stock as A3K9N3 on the middle of the steel bar stock.
DX79EQ	The serial number on the stainless steel bar was raised to read A3K9N3.
E6ABKK	Serial number restorations were performed and it was determined to read A3K9N3.
ECGBB6	Examination of the submitted stainless steel bar stock found the original serial number to have been obliterated. Physical and chemical processing of the submitted bar stock restored the obliterated, original serial number to read "A3K9N3".
EH39VL	Item #1 - The obliterated serial number on the piece of stainless steel bar stock (Item #1) was restored to read "A3K9N3".
EPFNC8	After application of the electro-magnetic process, I determined the serial number of the exhibit mentioned in 3.1 as A3K9N3.
EPWKLC	The serial number was restored to read A3K9N3.
ETCBMD	The area associated with the serial number showed shallow, even obliteration. Mechanical and chemical restoration techniques fully resolved an identifying mark: A3K9N3.
EWGW29	3. On 2014-10-13 during the performance of my official duties I received a sealed evidence bag with number PAD000580213 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) sealed box marked "Test No. 14-5251: Serial Number Restoration" containing the following: 3.1.1 One (1) envelope marked "Test No. 14-5251 Item 1" containing the following exhibit: 3.1.1.1 One (1) piece of metal marked by me "210515/14 1". 3.1.2 One (1) envelope marked "Aluminum Standard Test No. 14-5251", 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-magnetic process, I determined the number on the piece of metal mentioned in paragraph 3.1.1.1 as A3K9N3.
EWZ3YD	After application of the electro-magnetic process I determined the serial number of the piece of steel mentioned in 3.1 as A3K9N3. The conclusions arrived at were based on facts, established by means of a process which require a knowledge and skill in Forensic Ballistics.
EX9YL3	After the application of the electro-acid etching process I determined the serial number of the stainless steel bar stock as A3K9N3.
EXNFGV	the number on the was removed.[sic] The digits of the number 'A3K9N3' are restored after the electromagnetic method.
EYMGP9	* After application of electro magnetic process, I determined the serial number A3K9N3 of

TABLE 2

WebCode	Conclusions
	the exhibit mentioned on Item 1. * A conclusion arrived at were based on facts which were established by means of process of Electro Magnectic used to recover the number which was obliterated.[sic]
F32DTP	Restorated[sic] number is "A3K9N3".
FB3BM9	Submitted in small envelope marked "Test No. 14-5251 Item 1": One rectangular in shape, piece of stainless steel bar stock, measuring 1" x 2 <sup>3</sup> / <sub>4</sub> " x 1/2" and weighing 1,361 grams. Serial number defaced by circular abrasions. Serial number restored using chemical etching process and Magnetic Partical[sic] Inspection. Serial number reads: A3K9N3. CTS [Participant Code] etched on back side, by examiner, for identification.
FGV7TM	The Serial Number on the stainless steel bar was restored to read A3K9N3.
FKJJXT	The recovered serial number of the steel plate is A3K9N3.
FQDRUB	One (1) stainless steel bar stock, 1" in length and 2 <sup>3</sup> / <sub>4</sub> " in width. Serial number defaced by abrasion, however restored using a chemical etching process. Scribed CTS #14-5251 for Identification purposes.
FUMPV2	On 2014/10/23 during performance of my official duties I received a sealed evidence bag with number PAD000586483 from Case Administration of Ballistics Section containing the following exhibits: 3.1 One (1) piece of stainless steel bar with suspected obliterated serial number marked by me "210703/14 A". 3.2 One (1) piece of aluminum bar written 1234567890 ABCDEFHJKN not marked by me. 4. Intention and scope of the forensic examination comprises of the following: 1. Examination of stainless steel bar. 2. Techniques associated with recovering and restoration processes of obliterated alpha-numeric figures on metals. 5. After application of the electro magnetic process, I determined the serial number of the exhibit mentioned in paragraph 3.1 as A3K9N3.
G2TYCW	Visual examination of this item revealed the presence of grind marks on the center of the bar on one side. This area was etched with acid solutions and the following was restored: A 3 K 9 N 3
G2ZMY6	Based on the "Magnaflux" and "Fry's" reagent results it was established that the oblitarred[sic] serial number in the stainless steel bar corresponds to "A3K9N3". This serial number is consistent with the one in the know[sic] bar.
GNZLKJ	The defaced serial number was restored and appears to read: A3K9N3.
GVXRFF	The recovered alpha-numeric serial numbers is A3K9N3.
GYLLMH	The serial number of submission 1 as restored is A3K9N3.
HE6KEY	After the application of the electro-acid etching process I determined the serial number of the exhibit or piece of stainless steel bar stock as A3K9N3.
HPVKLY	Examination and processing of the obliterated serial number on the submitted plate restored the serial number to read "A3K9N3".

TABLE 2

WebCode	Conclusions
HU2TG8	After application of the electro magnetic process I determined the serial number of the piece of stainless steel bar stock as A3K9N3.
J79M92	The serial number of Item 1 was chemically restored to read A3K9N3.
JBBHKL	The area of obliteration was mechanically polished then subjected to magnetic particle inspection and chemical etching. The serial number was fully restored to: A 3 K 9 N 3
JTV46C	The serial number area on Item 1 was physically and microscopically examined, then prepared and treated with restoration reagents. The serial number A3K9N3 was restored to legible condition.
JYEC3	Submission #1-2 had a milled section that was suspected of having a serial number. The area was polished and magnetic particle inspection method was used to restore the serial number. The serial number was restored to be "A3K9N3".
JZJL8X	3. On 2014-10-21 during performance of my official duties, I received a sealed evidence bag with number PAD000586485 from Case Administration of Ballistics Section containing the following exhibits: 3.1 One (1) piece of stainless steel bar stock with suspected obliterated serial number marked by me "207826/14 1". 3.2 One (1) piece of aluminum bar stock with number 1234567890 and alphabetical letters ABCDEFHJKN. 4. The intention and scope of this examination comprise of the following: 4.1 Techniques associated with the recovering and restoration process of obliterated alpha numerical figures on metals. 5. After application of the electro-magnetic, I determined the serial number A3K9N3 on the alleged obliterated area of the stainless steel bar mentioned in paragraph 3.1.
JZZPVX	After application the electro-acid etching process I determined the serial number of the exhibit mentioned in 3.1 as A3K9N3 in the middle across plate.
K7LUAJ	After application of the electro-acid etching process the number was easily restored.
KF8Z3G	Serial number restoration procedures were performed and it was determined that the serial number was restored to read: A3K9N3.
KL7X2B	The obliterated serial number has been restored as A3K9N3.
KTE7WF	After application of the electro-magnetic and electro-acid etching processes, I determined the serial number on the plate marked 189036/14 "Item 1" as A3K9N3.
LU6PE8	After application of the electro magnetic process I determined the serial number A3K9N3 on the centre of the metal.
M46KPE	1. Examination and magnetic processing of Item 1 restored the original obliterated serial number which was determined to be: A3K9N3.
ME3NRM	Item 1 - one (1) piece of bar stock with obliterated serial number. 1 - piece of aluminum bar stock as a standard. The submitted specimen marked as Item 1, was examined and identified, as a single piece of stainless steel bar stock with a obliterated serial number. Item 1 was microscopically and chemically processed. As a result of chemical processing using Acidic



TABLE 2

WebCode	Conclusions
	Ferric Chloride, Ferric Chloride and Sodium Hydroxide, it was concluded that the obliterated serial number of Item 1 was restored to its original number which is "A3K9N3".
MFZPZZ	Serial Number Restoration Analysis: Methodology - Chemical Reagent Etching/Microscopy/Physical. Serial number restoration procedures revealed the serial number on Item 1, to be: A3K9N3.
MKGK4C	The serial number on the metal bar was restored and appeared to read as: A3K9N3.
MLMN8Z	A laboratory examination was conducted. The results are as follows: 1. Chemical processing was conducted. A serial number was restored to read A3K9N3.
MR8Q9B	After the application of the acid-etch method the serial number on Item 1 was perceived as "A3K9N3".
MURTXV	Serial number was restored to read A3K9N3.
MWZQM7	The Item 1 obliterated serial number was mechanically and chemically processed and restored to read "A3K9N3".
MYJ6Q8	The Item 1 metal bar was physically and chemically processed in an attempt to restore the obliterated serial number. The serial number was restored to read A3K9N3.
N2TA6V	The serial number has been restored successfully and appeared clearly and entirely.
NANEXW	Restoration of the obliterated serial number was performed on questioned surface of the stainless steel bar stock marked "Item 1". The restored serial number was found to have six characters – "A3K9N3".
NBN7DL	The obliterated serial number on item #1 stainless steel metal bar was restored to read A 3 K 9 N 3
NCXYAY	On the surface of presented exhibit has been detected (recovered) following serial number: „A3K9N3“.
NHPGNK	Through the serial number restoration process the following was determined[sic]: The serial number of the stainless steel bar stock described in the Item 1, was restored and correspond to: A3K9N3.
NZ4TJW	3. On 2014-10-15 during the performance of my official duties I received a sealed evidence bag with number PAD000580210 from Case Administration of the Ballistics Section, containing the following: 3.1 One (1) inner sealed white box, containing the following: 3.1.1 One (1) brown taped sealed envelope, containing the following exhibit: 3.1.1.1 One (1) piece of stainless steel bar stock, marked by me with "201602/14 Item 1". 3.1.2 One (1) brown taped sealed envelope, containing the following item: 3.1.2.1 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 "201602/14 Al.St". 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 magnetic process on the exhibit as mentioned on paragraph

TABLE 2

WebCode	Conclusions
	3.1.1.1, I determined the obliterated alpha numeric figures as A3K9N3.
P292JX	Serial Number Restoration Analysis: Methodology - Chemical Reagent Etching/Microscopy/Physical. Serial Number restoration procedures revealed the serial number on Item 1, to be: A3K9N3.
PAK42M	The serial number has been restored successfully[sic] and appeared clearly and entirely.
PGC8DY	After the application of the electro-acid etching process I determined the serial number of the exhibit possibly as A3K9N3
PNT64X	PERFORMED METHOD DEVELOPMENT OF A SERIAL NUMBERS OF STEEL BAR, THE SERIAL NUMBER A3K9N3, WHICH HAD BEEN CLEARED IN ELEMENT ANALYSIS PURPOSE OF ACQUIRED. [sic]
Q2DJKC	After application of the electro-acid etching process, I determined the serial number of the exhibit mentioned in 3.1.1 as A3K9N3.
Q7HM2X	After application of the electro-magnetic process, I determined the serial number of the stainless steel bar stock as A3K9N3.
QFCQD8	After the application of the electro-acid etching process, i determined the serial number of the aluminium bar stock mentioned in 3.1 possibly as A3K9N3 in the middle.
QHA7LZ	The original serial number was A3K9N3.
QKKUHN	The conclusions arrived at the were based on facts, established by means of on examination and process which require a knowledge and skill in Forensic Ballistics. [sic]
QMC62U	3) 3.1) One (1) piece of metal with serial number erased, marked by me "201535/14A". 4) 4.1) Techniques associated with the recovering and restoration processes of obliterated alpha-numeric figures on metals. 5) After application of the electro-magnetic process, I determined the serial number on the piece of metal mentioned in paragraph 3.1 as A3K9N3.
QNTMNA	An area of obliteration with arched striae was observed in the center of Item #1 (stainless steel bar) that was suspected to have had a serial number. The serial number in the center of the steel bar was recovered as: A3K9N3.
QPUCEV	After application of the electro-magnetic etching process, I determined the serial number of the exhibit mentioned as item 1 as A3K9N3.
QRMMHZ	Item #1 is a piece of metal indicated to be a piece of stainless steel bar stock being approximately 2 3/4" long, by 1" wide and 1/4" thick, with an area approximately 1" by 1" that was consistent with being face milled to remove metal. Examination and chemical processing of Item #1 restored the original obliterated serial number, which was determined to be "A3K9N3".
QX3R2Z	Identifying markings, "A3K9N3", restored using chemical etching process.
QYG8F2	Using standard laboratory restoration techniques, the obliterated serial number on Item 1 was

TABLE 2

WebCode	Conclusions
	restored to read A3K9N3.
QZBZBK	The characters which were chemically restored are 'A3K9N3'.
RCGNKU	Using the acid-etch method, the number on the steel bar stock (Item 1) was completely restored as "A3K9N3".
RET2PK	Chemical restoration of the obliterated area on the bar stock, CTS Item 1, reveals the following number: A3K9N3.
RGRPGX	Serial number restored by chemical etching process.
RMQUZZ	After application of the electro-acid etching process and the electro-magnetic process, I determined the serial number of the bar stock A3K9N3.
RVRFU	Restoration of the obliterated serial number was performed on the questioned surface of Item 1, and the restored serial number was found to be "A3K9N3".
RYTJCX	Serial number restoration procedures revealed the serial number on Item 1 the metal bar stock to be A3K9N3.
T22YFR	After application of the electro-magnetic etching process, I determined the serial number of the exhibit marked Item 1; as A3K9N3.
T9V8LL	Attempts to restore the obliterated serial number of Item 1 were successful. The restored serial number is: A3K9N3
TM63MY	The serial number on the steel bar was restored as A3K9N3.
TUMDZZ	The previously obliterated serial number was completely restored to read A3K9N3.
TVUB3P	After application of the electro-magnetic process, I determined the serial number of the peace[sic] of stainless steel bar stock as A3K9N3.
TWTVYV	After applying the suitable chemical reagents, the recovered characters were "A3K9N3"
TXVH4K	Visual examination of this item revealed the presence of grind marks on the center of the bar. This area was etched with acid solutions and the following was restored:
UMKNW2	The serial number of stainless steel bar stock was restored and determined to be A3K9N3.
UXJR3P	3. On 2014-10-16 during the performance of my official duties I received a sealed evidence bag with number PAD000580211 from Case Administration of the Ballistics Section, containing the following exhibit: 3.1 One (1) piece of stainless steel bar with numbers removed marked by me "201662/14 A". 4. The intention and scope of this forensic examination comprise of the following: 4.1 Techniques associated with the recovering and restoration process of obliterated alpha-numeric figures on metals. 5. After application of the electro-magnetic process, I determined the numbers on the exhibits mentioned in paragraph 3.1 as A3K9N3.

TABLE 2

WebCode	Conclusions
V3FEJL	The obliterated area on Exhibit 1 (Non Magnetic Metal) was visually examined, polished and chemically processed. The characters were restored and appeared as follows: (A 3 K 9 N 3).
VBWTQX	Using standard laboratory restoration techniques, the obliterated serial number on Item 1 was restored to read A3K9N3.
VKFC2G	Exhibit:1 Item Submitted: One metal bar. Findings: Examination of Exhibit #1 revealed an obliterated area in the middle of the metal bar. Standard restoration techniques revealed the characters "A3K9N3".
VLXE6	Item #1 is a stainless steel bar with suspected obliterated serial number. Serial number located in the center of bar. Serial number restoration procedures were performed and the serial number was restored to read A3K9N3.
VNDRA6	Examination of Item 1 revealed a metal bar stock measuring 1" x 2 13/16" x 1/4" with serial number obliterated. Using standard laboratory serial number restoration techniques, an attempt was made to restore the obliterated serial number with the following result: Serial Number : A 3 K 9 N 3 was successfully restored on Item 1 .
VQE2WW	The serial number of the Item 01-01 bar stock was restored to read, "A3K9N3."
VUADM2	Using standard laboratory restoration techniques, the obliterated serial number on Item 1 was restored to read "A3K9N3"
VWL7M4	After application of the electro magnetic etching process, I determined the serial number of the steel plate (marked 189043/14Item 1), possibly as A389N3.
VWW4EX	The serial number on Item 1 was restored and reads: A 3 K 9 N 3
WPD2AB	Through the serial number restoration process was determined: The serial number of the stainless steel bar stock, described in the item 1 was restored and correspond to: A3K9N3.
WPHJAU	After applying acid etching method A, 3, K, 9, N, 3 were retrieved.
WVLHKK	On 2014/10/30 during the performance of my official duties I received a sealed evidence bag with number PAD000586484 from Case Administration of the Ballistics Section, containing the following exhibits: 3.1 One (1) piece of metal with number erased and marked by me "207892/14 A". 3.2 One (1) piece of aluminum marked by me "207892/14 B". 4. The intention and scope of this forensic examination comprises of the following: 4.1 Techniques associated with recovering and restoration processes of obliterated alpha-numeric figures on metals. 5. After application of the electro magnetic process, I determined the serial number in the middle section of the metal piece mentioned in paragraph 3.1 as A3K9N3.
X982VF	The conclusion arrived at were based on facts established by means of an examination and process which require a knowledge and skill in forensic ballistics.
XAYBNG	After application of the electro-magnetic etching process, I determined the number of the exhibit mentioned as item 1 as A3K9N3.

TABLE 2

WebCode	Conclusions
XG28NG	After following the right procedure in etching the numbers were recovered using electro-acid etching process.
XGGL2H	On 2014-10-20 during performance of my official duties I received a sealed evidence bag with number PAD000586486 from Case Administration of Ballistics Section, containing the following exhibits: 3.1 One (1) piece of stainless steel bar stock with erased serial number marked Test no 14-5251 Item 1. 3.2 One (1) piece of aluminum standard bar stock not marked. 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. After application of the electro magnetic process, I determined the serial number of the metal mentioned in paragraph 3.1 as A3K9N3.
XRENYQ	Serial number restoration procedures revealed the serial number on Item 1, the stainless steel bar stock, to be: A3K9N3.
XUNGC8	We have revealed six (6) graphic characters removed from the surface of the element.
XYKK9Q	THE CONCLUSION OF THIS REPORT IS THAT, THIS CASE ITS BEEN SUCCESFUL.AFTER RESTORATION AND CHEMICAL EXAMINATION THIS IS THE RESULT A3 K9 N3. [sic]
XZHPAP	The obliterated serial number was restored and concluded to most likely be A3K9N3.
YAX66R	The obliterated serial number on the submitted stainless steel bar stock (Item 1) is A3K9N3.
YB2LUM	EXAMINATION OF THE SUBMITTED PIECE OF BAR STOCK FOUND THE SERIAL NUMBER TO HAVE BEEN OBLITERATED. PHYSICAL AND MAGNETIC PROCESSING OF THE SUBMITTED BAR STOCK RESTORED THE OBLITERATED, ORIGINAL SERIAL NUMBER TO READ A3K9N3.
YFZYVM	After application of the electro-magnetic process, I determined the serial no of the stainless steel bar as A3K9N3.
YQTEJU	USING STANDARD LABORATORY RESTORATION TECHNIQUES, THE OBLITERATED SERIAL NUMBER ON ITEM 1 WAS RESTORED TO READ: A 3 K 9 N 3
YQUDBG	THE SURFACE OF ITEM 1 A SECTION OF STAINLESS STEEL BARSTOCK WAS POLISHED TO PREPARE IT FOR THE CHEMICAL ETCHING PROCESS. THE NUMBER WAS RESTORED BY THE CHEMICAL ETCHING PROCESS TO READ- A3K9N3.
YTL8ED	After examination and processing of the stainless steel bar the original obliterated serial number was determined to be "A3K9N3".
YXDGLQ	The serial number of Item 1 was restored to read A3K9N3. Item 2 (standard) was not examined further.
YY83G3	Examination and chemical processing of Item 1 restored the original obliterated serial number, which was determined to be "A3K9N3".
ZMHJHZ	Examination of Item 1 disclosed one (1) piece of stainless steel bar stock bearing an apparent obliterated serial number. Chemical restoration revealed the characters "A3K9N3".

TABLE 2

WebCode	Conclusions
ZTDREH	CHEMICAL RESTORATION OF NUMBER ON STAINLESS STEEL SAMPLE. START TIME : 14H20 / FINISH TIME / 14H35. NUMBER STAMPED : A3K9N3

# Sample Preparation

TABLE 3

WebCode	Sample Preparation
22MGPV	Obliterated area of Item 1 was polished with lab rotary tool.
2D7RPG	Polishing and sanding.
2GPZVV	1) I grind down the obliterated area on the plate with the use of a dremel, until the surface were smooth and polished. 2) I applied the electro-acid etching process and retrieved[sic] the serial number on the plate.
2L2R3N	Sanding and polishing.
2NAXL4	Polished the bar with an electrical rotary tool and then cleaned with acetone.
2PJ6NW	I cleaned the surface with sand paper mounted on the dremel tool. I cleaned the surface until it was mirror shine.
2R843K	Sand papered and polished the sample until it was mirror smooth. Mechanical tool was used to prepare and polish the surface. Cleaning was done with alcohol or acetone.
2URC67	Sanding and polishing with a Dremel Tool.
33K6TK	1. Apply the white contrast paint on the affected area. 2. Magnetise the affected area. 3. Spray iron ore fillings on the affected area.
34ADXL	Polishing with dremel tool and rinsing with acetone.
37FXLL	Dremel tool with a grinding wheel used to smooth and polish the surface.
38AJGX	Polish obliterated area
3C8J2M	Due to the uniform smoothness of the obliterated area and there was no indication of any type of "coating" on the area, there was no preparation performed prior to the application of chemicals.
3NZKEP	Polish milled area to 'mirror-like' finish
43LK9W	"Item 1" - initial condition recorded, visual examination using stereomicroscope and oblique lighting, test substrate magnetic property, region of interest polished using wet & dry sandpaper grades 80, 320, 600 and 1000 to near-mirror finish, surface cleaned with acetone.
49YCPL	The obliterated area was polished.
4B7RZY	Polishing (dremel)
4CKVBM	Sanding and polishing.
4HER2Y	The surface of the piece of aluminum was polished with a dremal[sic] tool.
63F8XF	Polish surface and spray with white contrast paint.
69C76L	Cleaned obliterated area with acetone.
6B9XMM	The surface was cleaned and polished with a fine sand (emery) paper to remove scratches

TABLE 3

WebCode	Sample Preparation
	and other gross marks. This surface was polished to a mirror like finish then clean it with alcohol or acetone.
6CD886	Sanding and polishing.
6GAT2T	320 grit sandpaper and steel wool
6HPAD3	The surface was observed to verify if some character were seen, and then the surface was polished.
6MVT9T	The Exhibit's composition was examined using SEM/EDX, and was found to be chromium-nickle[sic] stainless steel. The Exhibit's surface was lightly polished, using grinding paper 600. The sample was cleaned with acetone.
6W2XXN	Polishing to a mirror finish with a Dremel tool.
6XYZC2	dremel tool with sandpaper
6YX2KE	The sample was taken to the workroom. Then it was cleaned with solvent. Then the obliterated area was sanded down slightly.
7ACYNE	1. Inspecting initial area of the serial number for coating and to also determine the method used for obliteration. 2. Recording the condition of the area of obliterated serial number as received by taking a photograph. 3. Cleaning the area of the obliterated serial number of any coating with solvent. 4. Polish the area to be etched mirror smooth and clean it again before etching.
7CQ34W	Dremel with cratex wheel.
7K9NG4	The surface of the stainless steel bar was cleaned with acetone followed by treatment with emery paper to provide a smooth surface.
7NTZHK	The obliterated area was polished using a Dremel tool, first with a rubberized wheel, then with a cotton type wheel with polishing compound applied. The obliterated area was polished lightly and for a total time of approximately 2 minutes.
7W7JGJ	Electro magnetic process
8AMLTG	Slightly sanded. Sprayed stainless steel bar stock with white contrast paint for particle inspection. Application of magnetic yoke on stainless steel. Sprayed stainless steel bar stock with black magnetic particle fluid.
8CB9AB	The object was cleaned with solvent and then sand down slightly. A thin layer of white contrast spray was then applied to the questioned area and left to dry for a few seconds. One leg of the electro magnet was attached on either side of the object and magnetised for approximately 15 seconds. Magnetic suspension ink was then applied on area and the object magnatised[sic].
8EHD3Y	Sandpaper with water.
8WKWKD	First the piece was cleaned using a toothbrush and cleaner industry, then the piece was cleaned again with pure acetone, finally was polishing using a dremel tool and different polishing wheels until to have mirror shine. [sic]
8X4FAP	I took record shots of the item prior to restoration attempts.



TABLE 3

WebCode	Sample Preparation
96LXB4	Sanding with emery cloth
9A2MYF	I cleaned the area to BTO be etched using a a sand paper and a dremel tool, polished it until it is mirror shine, shake the magnetic suspension, place the stainless steel stock bar on the Ganmatech magnet and applied two drops of the magnetic suspension. [sic]
9BW7XV	Light sanding
9CMBAL	Surface was sanded to remove machine marks.
9H8FXF	Polishing
9JQBRW	The method used was polish the surface of the obliterated area.
9M6Y2Y	Dremel tool for polishing obliterated area.
A9H68K	1. Visual and microscopic examination 2. Sanded with successively finer sandpapers until smooth finish was obtained.
AB8HP4	A rotary tool with a polishing wheel was used to polish the area of obliteration after initial observations were documented.
AC9PHJ	Physical and microscopic observation of the surface in Item 1 research. Mirror polishing surface effect of Item 1. Application of nitric acid to determine the type of metal alloy.
ACEVBB	Initial observations made of affected area to determine method of obliteration. Initial photograph taken with lighting and stereo microscope. Second, fellow examiner verifies initial observations.
BJAADN	sand paper, steel wool, dremel tool (cratex wheel)
BNM3KG	Polished
BQKZPD	Sand paper and Dremel tool to smooth out surface. Clean surface with alcohol prep. Cotton wool with solution of Copper II Ammonuim[sic]-chloride mixed with Hydrochloric acid. Etching. Clean plate and lightly oil.
BZH7QV	SURFACE PREPARATION USING FINE GRADE SAND PAPER.
C9BYHL	Obliterated area was polished to near mirror finish with sand paper starting with course grit ending with fine: 220, 320, 600, 1200.
CAMD9G	None.
CCHDWF	The obliterated surface of the suspect area was uneven as received. Therefore, a Dremel® tool was used to make the suspect area smooth and free of gouges. An emery wheel was used with the Dremel® tool. The area was then polished with a polishing attachment.
CRWLWJ	1- Inspecting initial area of the serial number for coating and also determine the method used for obliteration. 2- Recording the condition of the area of abliterated serial numer as received by taking a photograph.[sic] 3- cleaning the area of the obliterated serial number of any coating with solvent. 4- Polish the area to be treated with light sanding.
CYB8EV	[Sample Preparation was not reported by participant].

TABLE 3

WebCode	Sample Preparation
DE8ZCK	Polished to a mirror finish with Dremel tool
DEHLAY	I have attached the dremel disk on the dremel machine and polished the steel bar stock on the area that shows the marks of obliteration, until it became mirror smooth. I clamped the steel bar stock with a claw of the electro-acid etching apparatus for the electric current and dipped the piece of the cotton into the Green mamba solution (50ml-Hydrochloric Acid + 50ml-distilled water + Diammonium Copper Chloride-2hydrate) and wiped with it on the polished area until the number became visible.
DX79EQ	Moto Tool Buffing
E6ABKK	Ligt[sic] sanding with brillo pad. Cleaned with acetone.
ECGBB6	Polishing with a dremel
EH39VL	Visual, polishing, chemical.
EPFNC8	1) The obliterated area was sanded down to a smooth surface. 2) White contrast paint was applied on the area. 3) Area was magnetize[sic] for approximately 30 seconds. 4) Finally black magnetic inspection fluid was applied to this area.
EPWKLC	Obliterated area was polished prior to application of reagents.
ETCBMD	The obliterated area of the metal was polished with a Kraton tip (extra fine) and a Dremel.
EWGW29	Electro-magnetic process. Surface of suspected obliterated number was sanded with a smooth sanding disc. Polished to a mirror shine with a filtered covered tip. Cleaned with Chemserve clorinated solvent cleaner. Adrox white background lacquer spray was sprayed over the suspected area. Piece of metal was magnetized with a Gammatec magnetizer. Adrox black magnetic ink was added unto the suspected area to reveal the obliterated number/alpha-numeric figures. Metal was cleaned with Chemserve clorinated solvent cleaner after the electro-magnetic process. [sic]
EWZ3YD	Area to be etched was polished mirror smooth, by using a sand paper with Dremel tool.
EX9YL3	The obliterated area of the stainless steel stock was polished using dremel disc until it was mirror smooth. I then attached a positive pole of electric-etching apparatus to the steel stock and wrap cotton wool around negative pole, dip cotton wool in a acid mixture (Green Mamba) I rub the saturated cotton wool repeatedly from left to right over the obliterated area until the number appears, I then record the number as it appeared.
EXNFGV	the is photographwd before examination. The surface is cleaned. It is applied electromagnetic method. [sic]
EYMGP9	* I took the bar stock to the workshop, cleaned the obliterated area with a solvent (alcohol) to remove all oils. * Area where the number was obliterated, slightly sandpapered and polished until shiny and mirror smooth (the dremel tool with sandpaper attached were used), I sprayed thin layer of contrast spray (white spray) and left the surface to dry for 3 seconds. Attached both legs of the yoke to the size of the bar stock on both sides, Magnetized obliterated area from different angles and positions, plate was magnetized for approximately 15 seconds. I shook magnetic suspension (black oil) and applied 5 drops on magnetized area, I kept the surface horizontal, I left it for 10 - 15 seconds and the number developed.
F32DTP	Cleaning with acetone.

TABLE 3

WebCode	Sample Preparation
FB3BM9	Surface polishing
FGV7TM	Polished with a Dremel tool.
FKJJXT	A-Hand Sanding and Polishing prior to using itching[sic] acid.
FQDRUB	Polish area with grinding wheel.
FUMPV2	1. Inspect the exhibit and identified the area where the serial number was suppose to be allocated for coating. 2. Check type of material is the exhibit and decide which method is suitable for etching. 3. Record the condition of the exhibit. 4. Photograph the exhibit and take measurements. 5. Clean the area to be etched with solvent. 6. Polish the area to be etched and clean it again.
G2TYCW	None
G2ZMY6	1. Visual and microscopic observation using stereomicroscopic[sic]. 2. Sanding used fine grit sandpaper. 3. Polished to a mirror finish. 4. Cleaning surface with acetone.
GNZLKJ	The sample was not prepared prior to serial number restoration.
GVXRFF	Electro acid etching process.
GYLLMH	Visual and microscopic exam performed prior to restoration process, no alpha or numeric characters observed. Sanded and polished area, applied the following chemicals, first phosphoric/Nitric acid negative results, resanded and polished area applied Acidic Ferric Chloride negative results, resanded and polished area applied Fry's Reagent S/N restored, A3K9N3.
HE6KEY	The sample prior to attempt at recovery the metal the metal was first marked by me 228965/14A and polished with the dramel tool to a mirror shine and smooth and the green mamba was already prepared to begin the restoration process. [sic]
HPVKLY	Sanding discs 400 & 600 grit
HU2TG8	Cleaned the area to be etched, polished it mirror smooth (shine) and placed the bar stock on electric magnet and apply the Iron filings[sic].
J79M92	1 - Surface is observed in the stereomicroscope to detect traces of method used to remove the surface defining that was altered by an circular cutting tool.[sic] 2. Sand papered and polished the sample until it was mirror smooth. Mechanical tool was used to prepare and polish the surface. 3. Cleaning was done with alcohol or acetone.
JBBHKL	The area of obliteration was mechanically polished using a Dremel tool with a Cratex abrasive wheel.
JTV46C	The machining marks on the serial number area were smoothed using 320 grit emery paper backed by a flat file. Many of the machining marks were eliminated by removing about .001" of material. The machining marks that remained did not interfere with the legibility of the serial number. An un-machined portion of the Item 1 bar adjacent to the serial number area was also smoothed in the same manner to provide an unmarked surface where the reactivity of the restoration reagents could be tested.
JYEC3	Various grit grinding wheels, felt wheel charged with buffing compound, cleaning with

TABLE 3

WebCode	Sample Preparation
	acetone.
JZJL8X	1. Inspect the area where the serial number is located for coating and as to determine the method to be used for etching. 2. Record down condition of the exhibit as received and take photos. 3. Clean the area to be etched of any coating with solvent. 4. Polish the area to be etched and clean it again before etching.
JZZPVX	I attached the dremel disc on the dremel machine and polished the stainless steel[sic] until it was mirror shine. I then clamped the bar with a terminal for an electric current and dipped the piece of a cotton into a solution comprising of: -50 ml hydrochloric acid, -50 ml distilled water, -5 grams of diammonium copper(ii) chloride and 2 hydrate and wiped it on the polished area until the number appeared.
K7LUAJ	I made the obliterated area smooth.
KF8Z3G	Before I attempted to recover the serial number, I had to determine which chemicals I needed to prepare for the restoration process.
KL7X2B	The sample was emiered using an emery cloth.
KTE7WF	a) First sanded the plate with coarse sanding paper. b) Secondly sanded the plate with finer sanding paper till surface was smooth. c) Put some polishing compound on the surface and polished the plate till its smooth and shiny. d) Then I etched the plate with both etching methods (Electro magnetic and Acid etching processes)
LU6PE8	Area to be etched was polished mirror smooth with a dreltool[sic] and sand paper. I spray thin layer of contrast spray and after few seconds I put the steel on the Gammatech to magnetised it. I apply few drops of suspension spray to retrieve the serial number.
M46KPE	None
ME3NRM	Dremel tool processing Steel wool
MFZPZZ	Sanding
MKGK4C	The sample was not prepared prior to serial number restoration.
MLMN8Z	Polishing and testing for magnetism.
MR8Q9B	Polished with finest grit polishing wheel and dremel tool.
MURTXV	None
MWZQM7	Polishing with Dremel tool and 0000 steel wool.
MYJ6Q8	light sanding and chemical etchants
N2TA6V	Polishing and HNO <sub>3</sub> (10%)
NANEXW	Polishing with sandpaper of various grades (roughness). Cleaning the surface with ethanol.
NBN7DL	sand paper was used to smooth out the tool marks.
NCXYAY	1. The surface of the exhibit has been examined with "Foster+Freeman's Crime- Lite ML2" by applying UV light of 395-425 nm along with GG455-AG filter. 2.The surface of the

TABLE 3

WebCode	Sample Preparation
	exhibit has been also examined with "Foster+Freeman's VSC 6000/HS" by applying UV light of 365nm. 3.The surface of the exhibit has been cleaned with METAL SURFACING SOLUTION (RAG 5003 SIRCHIE). 4.The surface of the exhibit has been polished by sandpaper (Emory[sic] Paper; Emery Clth[sic]).
NHPGNK	Polish the surface of the obliterate area.
NZ4TJW	*I only cleaned the area of the obliterated serial number with Acetone to ensure the white contrast spray will stick to the stainless steel bar.
P292JX	Sanding/Polishing
PAK42M	Cleaned with acetone
PGC8DY	I ground down and then polished the obliterated area with a dremel, prior to etching.
PNT64X	COTTON AND ACETONE IS USED WHERE A CLEAN THE SURFACE ANALYSIS IN ORDER TO REMOVE DIRT AND OILS.[sic]
Q2DJKC	Sanding and polishing of the exhibit.
Q7HM2X	1) Clean the area using sand paper. 2) Apply white contrast on the affected area. 3) Magnetize the affected area. 4) Spray iron fillings on the affected area and magnetized area.
QFCQD8	Polishing the surface using Dremill[sic] and Sandpaper
QHA7LZ	The metal surface was cleaned with water and organic solvent and then polished with abrasive papers until a smooth surface was obtained.
QKKUHN	The plate bar was cleaned and polished to mirror shine and smooth using the dremel and a dremel disc. Turn on the voltmeter and set the desired voltage. Plug the contact points of the two conducting wire into their respective sockets on the panel board. Attach the crocodile clip to the object to be etched, wind a piece of cotton wool around the copper point of the blank conducting wire and soak it in the etch solution (solution mamba) acid solution and apply it to the area where the number has been erased or suspected to be erased. Photograph the number as soon it is legible. Also the magnetic process was used.
QMC62U	Lightly sanded the obliterated area using the dremel tool, until the area was smooth and had a mirror-like finish. Cleaned the area with acetone.
QNTMNA	1. Verify the bar was non-magnetic. 2. Polish with extra fine wheel on a Dremel at low speed. 3. Clean with acetone. 4. Spot test Fry's reagent in a corner of the obliterated area.
QPUCEV	Polishing and sanding.
QRMMHZ	Cleaned surface with Methanol. Used Dremel Rotary tool with sandpaper flapper wheel to smooth out area of the machining marks. Then used 400 grit sandpaper followed by "0000" steel wool to further polish surface of any markings.
QX3R2Z	Polishing of area in question.
QYG8F2	The plate was polished with a polishing wheel.
QZBZBK	The sample was lightly sanded with fine sand paper and polished prior to restoration.

TABLE 3

WebCode	Sample Preparation
RCGNKU	Polishing with a Dremel Tool.
RET2PK	Sanding/Polishing using the Dremel tool.
RGRPGX	Polish
RMQUZZ	Marking of the exhibit. Sanding down the exhibit.
RVRFU	Polishing with sand paper
RYTJCX	Photography, sanding, filing, polishing.
T22YFR	Polished the surface of the exhibit until it is smooth and shiny; as well as cleaned it.
T9V8LL	None
TM63MY	1. Sanded with emery paper to smooth surface.
TUMDZZ	The sample was first tested with a magnet. No polishing/sanding was deemed necessary before steps 1) & 2). See serial number worksheet for additional information [Referenced worksheet was not provided by participant].
TVUB3P	Polish surface and spray with white contrast paint.
TWTVYV	Prepare the surface (obliterated) of the sample on first step using sand paper number (gross grained) to take off ruggedness. After used a sand paper (fine grained) using at the same time a little quantity[sic] of water, this helps to obtain a polish surface.
TXVH4K	Documentation of the item - description on worksheet and photographic documentation prior to etching and during etching.
UMKNW2	1 - Visual and microscopic examination (using stereomicroscope). 2 - Sanding and polishing. 3 - Cleaned the surface with acetone.
UXJR3P	The sample was cleaned with solvent. Questioned area lightly sanded down.
V3FEJL	Cleaned area with distilled water and a paper towel.
VBWTQX	sanding
VKFC2G	In order to prepare the sample for restoration I tested to see if Exhibit #1 was magnetic or not, I took a picture of the obliterated area, and then I lightly polished the area with a Dremel tool.
VLXE6	1. Initial inspection of the serial number area. 2. Record the as received condition of the serial number area by stereo microscope.[sic] 3. The serial number area was cleaned with acetone. 4. The serial number was polished slightly with abrasive tool.
VNDRA6	No methods were used to prepare the sample for restoration. The condition of the metal bar stock at submission was adequate for the recovery process.
VQE2WW	1. Polished with Dremel Tool Fitted with an emery wheel 2. Polished with metallic sandpaper
VUADM2	Cleaning with soft cloth

TABLE 3

WebCode	Sample Preparation
WVL7M4	No additional methods were used for preparation except sanding off the obliterated area on the steel plate to a mirror-like finish, before applying the electro magnetic etching process's white background paint.
VWW4EX	Region of interest was wet hand sanded with emery paper until smooth to the touch (approx. 10/15 mins).
WPD2AB	The surface was cleaned with a delicate task wipe and polished with soft sand paper prior to recover the obliterated serial number.
WPHJAU	Etch process. Cleaning the suspected area with sandpaper to be mirror like attached positive pole to the firearm, then attached cotton wool twist it around the tip on the negative pole. Tipped the cotton wool to acid solution. Every time the rod touches the firearm, a small current will flow through the cotton wool and the firearm and start with low current and adjust systematically to higher. [sic]
WVLHKK	The object to be examined was taken to the workshop, The area to be etched was slightly polished mirror smooth, The area was cleaned with solvent.
X982VF	The area to be etched was polished to mirror shine and smooth making use of the dremel and dremel discs. Turn the voltmeter on and set the desired voltage, plug the contact points of the two conducting wires into their respective sockets on the panel board. Attach the crocodile clip to the object to be atched[sic], wind a piece of cotton wool around the copper point of the black conducting wire and soak it in the etch solution (green mamba) acid solution and apply it to the area where the number has been erased or suspected to be erased. Photograph the number as soon as it is legible.
XAYBNG	Polishing and sanding.
XG28NG	I cleaned the stainless steel bar stock using dremel and dremel disc to make the area in question mirror smooth.
XGGL2H	[Sample Preparation was not reported by participant].
XRENYQ	Bar stock surface was smoothed with Dremel (sand/polish).
XUNGC8	macro- and micro-scopically
XYKK9Q	FIRST WE DO THE CLEANINIG OF THE SURFACE, POLISH THE METAL OF THE OBJEKT AND USING THE CHEMICHALS [sic].
XZHPAP	Polishing
YAX66R	I used an Emery wheel on a dremel tool to remove the machining marks, then a buffing wheel with very fine grit to polish the area.
YB2LUM	POLISHING
YFZYVM	Lightly sanded and sprayed with white background paint.
YQTEJU	Took measurements and photos of Item 1 as received before further analysis. Sanded and smoothed obliterated sn# area prior to applying etching solution.
YQUDBG	THE OBLITERATED SURFACE OF ITEM 1 BARSTOCK WAS POLISHED SMOOTH USING A

TABLE 3

WebCode	Sample Preparation
	POLISHING WHEEL ON A DREMEL TOOL.
YTL8ED	No preparation was used prior to recovery.
YXDGLQ	None.
YY83G3	Item 1 was visually examined and buffed with a fine grit sand paper.
ZMHJHZ	Visual inspection
ZTDREH	CLEANING WITH SANDPAPER



# Recovery Methods

TABLE 4

WebCode	Recovery Methods
22MGPV	Applied swabs of Acidic Ferric Chloride & 25% Nitric Acid (used mostly Nitric Acid once characters seen) only about 15 swabs used, Not recorded, not long, several seconds.
2D7RPG	Electro-magnetic etching process.
2GPZVV	Electro-acid etching process, +/- 40 seconds.
2L2R3N	Electro-magnetic etching process
2NAXL4	Fry's Reagent (approximatley[sic] one minute).
2PJ6NW	Electro-acid etching, 2 minutes.
2R843K	Magnetic Particle Inspection, 4 minutes; Chemical etching with Fry's Reagent, 2 minutes.
2URC67	25% Nitric Acid, 10 Minutes; Ferric Chloride, 10 Minutes; Acidic Ferric Chloride, 15 Minutes.
33K6TK	Electro-magnetic process
34ADXL	Hubball Reagent (Potassium Dichromate +HCl), ~2 min; Ferric Chloride, ~5 min; Ferric Chloride + Nitric Acid, ~30 sec.
37FXLL	Magnaflux, 2 sec.
38AJGX	Magnetic particle restoration
3C8J2M	Fry's Reagent was continuously swiped on the obliterated area with cotton swabs for approximately two minutes. No other chemicals used.
3NZKEP	-Polishing = Nothing; -Turner's Reagent = Nothing (10 mins); -Davis' Reagent = at about 3 mins characters appeared.
43LK9W	Visual examination - stereomicroscope and oblique lighting. ROI polished - wet & dry sandpaper 80, 320, 600 & 1000 to near-mirror. Surface cleaned with acetone. Chemical Treatment - Griffin's Reagent, 60 seconds. Surface cleaned with acetone.
49YCPL	Magnaflux Red Magnetic Particle Suspension; 10% Nitric Acid, 90 seconds; Fry's Reagent, 120 seconds.
4B7RZY	Griffin's Reagent, approx. 20 seconds.
4CKVBM	Electro-magnetic etching process
4HER2Y	Ferric Chloride, 1 min; Acidic Ferric Chloride, 1 min; Phospheric[sic]/Nitric, 2 min; Sodium Hydroxide, 1 min.
63F8XF	Electro-magnetic etching process
69C76L	-Polished using a Dremel tool. -Davis Reagent 8 minutes. -Turners Reagent 3 minutes

TABLE 4

WebCode	Recovery Methods
6B9XMM	Magnetic particle inspection method using with Magnaflux
6CD886	Ferric Chloride, Acidic Ferric Chloride, Nitric Acid
6GAT2T	The following two reagents were used in combination to restore the obliterated number. Davis' reagent ~3-5 minutes, Turner's reagent ~3-5 minutes
6HPAD3	Acidic Method: Fry's Reagent, 3 minutes.
6MVT9T	The polished surface was then treated with Fry's reagent for about 20 minutes. The process (using Fry's Reagent followed by contrast solution) was alternate[sic] repeatedly several times, till the serial number was restored completely. The restored serial number is A3K9N3. The results were successfully photographed.
6W2XXN	Acidic Ferric Chloride, ~5 minutes; 25% Nitric Acid, ~10 minutes.
6XYZC2	25% Nitric Acid, 10% Sodium Hydrochloride
6YX2KE	Electro-magnetic: spray a thin layer of contrast spray after shaking it well and leave surface to dry for a few seconds. Attach one leg of magnetic yoke on either side of the sample. Magnetise are[sic] for approx 15 sec. Shake magnetic suspension and apply 2-3 drops on magnetised area. Keep the surface horizontal and leave for 10 - 15 sec to develop.
7ACYNE	Magnetic particle inspection "Magnaflux"
7CQ34W	Magnaflux with magnet.
7K9NG4	Sodium Hydroxide Reagent 10%, 1 min; Fry's Reagent, 1 min.
7NTZHK	Fry's reagent was applied to the obliterated area with cotton swabs (left to right sweeping motion), and the characters "A3K9N3" were visible within approximately 1-2 minutes.
7W7JGJ	Electro magnetic process
8AMLTG	Electro-magnetic etching process
8CB9AB	The Electro Magnetic Process
8EHD3Y	Electrochemical etching using cupric ammonium chloride solution, 10-15 minutes.
8WKWKD	Magnetic method (magnaflux); Fry's reagent, 5 minutes.
8X4FAP	Acidic Ferric Chloride approx 10 minutes, Frye's[sic] reagent approx 10 minutes
96LXB4	Ferric Chloride - 30 seconds. Acidic Ferric Chloride - 30 seconds. Sodium Hydroxide - 30 seconds. Nitric Acid - 30 seconds. Then repeated
9A2MYF	Electro-magnetic etching process, none.
9BW7XV	Sanding, N/A; Acidic Ferric Chloride, Briefly; Sodium Hydroxide, Briefly; Nitric Acid, Briefly; Phosphoric Nitric Acid, Briefly; Davis Reagent, Briefly; Turner's Reagent, Briefly; Fry's Reagent, Briefly; Magnaflux. (Fully restored serial #A3K9N3)

TABLE 4

WebCode	Recovery Methods
9CMBAL	Magnetic particle inspection/Magnaflux.
9H8FXF	Ferric Chloride, Varies; Acidic Ferric Chloride, Varies; Phosphoric/Nitric Acid, Varies.
9JQBRW	Acidic method 1:Turner's Reagent, 10 minutes; Acidic method 2: Fry's Reagent, 5 minutes.
9M6Y2Y	Fry's Reagent, ~1 minute.
A9H68K	1. Visual and microscopic examination 2. Attempted Magnaflux, even though bar stock was non-magnetic 3. Tested bar with Etching Solution #1 (for cast steel) with no reaction 4. Tested bar with Etching Solution #2: Fry's (for cold rolled steel) with positive reaction. 5. Applied Solution #2: Fry's for approx 5 minutes. Last digit was visible. 6. Applied Solution #2: Fry's for add'l 10 minutes. All 6 digits/characters visible.
AB8HP4	Fry's Reagent, ~5 minutes; Ferric Chloride (to add contrast for photo), NA.
AC9PHJ	Revealed to the non-destructive method or magnetic (Magnaflux), 15 minutes; Chemical method or destructive method, 50 minutes.
ACEVBB	Method 1: Hand-polishing with sandpaper and oil, until grinding marks are muted. Method 2: Magna-Flux - electric magnet with a suspension containing metallic filaments in oil.
BJAADN	sand paper & steel wool, dremel tool (cratex wheel), Davis Reagent (about 1 minute), Turner's Reagent (about 1 minute), Fry's Reagent (about 2 - 3 minutes)
BNM3KG	Aluminum Solution, 30-60 sec.; Nitric Acid, 30-60 sec; Phosphoric Nitric Acid, 30-60 sec.
BQKZPD	Electro-acid Etching, apply in one direction several times.
BZH7QV	Magnaflux - a non destructive technique which is used on Iron based metals. Chemical Etching (Fry's reagent). The reagent being left on the test surface for approximately 10 minutes oblique lighting and stereo microscope utilised with both of the processes above.
C9BYHL	Acidic Method: Frye's[sic] Reagent - Approximately 1 minute on material.
CAMD9G	Magnetic Particle Inspection.
CCHDWF	Davis' Reagent was applied to the suspect for ~5 minutes. The first three characters were visible as A3K. The outline of the last three characters was visible; however, the characters were not legible at this time. Turner's Reagent was applied to the suspect for ~5 minutes. The first four characters were visible as A3K9. The last two characters were still not legible. Fry's Reagent was applied to the suspect for ~5 minutes. The serial number was then visible as A3K9N3.
CRWLWJ	Method 1, Magnetic Particle Inspection results A3K9N3 Time on material four minutes. Method 2, Fry's reagent applied with cotton swab, approximately 3 minutes on material
CYB8EV	Electrochemical process. Acidic Method: 10 minutes.
DE8ZCK	Fry's reagent, 1-2 minutes
DEHLAY	I have used Electro-Acid etching process and I got the number, therefore, I felt that there was no need to use the Electro-Magnetic etching process, + - 5 minutes.

TABLE 4

WebCode	Recovery Methods
DX79EQ	Fry's Reagent, Continuous swabbing and reapplication, short period of time, possibly 10 minutes total.
E6ABKK	Sanding lightly, brillo pad; Acetone, 1 to 2 minutes; Ferric Chloride[sic], 1 to 2 minutes; Acidic Ferric Chloride, 1 to 2 minutes; Nitric Acid/Fry's, 30 to 40 seconds.
ECGBB6	Polishing, Fry's Reagent (approximately 3 minutes)
EH39VL	Stereoscopic; Polishing; 25% Nitric Acid, 15 minutes; Acidic Ferric Chloride, 10-15 minutes.
EPFNC8	Electro-magnetic
EPWKLC	Fry's, 5 minutes.
ETCBMD	Acidic Ferric Chloride - Less than one minute.
EWGW29	electro-magnetic process, n/a.
EWZ3YD	The electro-magnetic process
EX9YL3	Electro-Acid etching process, +- 10 - 15 seconds
EXNFGV	Electromagnetic method
EYMGP9	Electro-magnetic[sic] process
F32DTP	Magnetoptical method; Chemical method with Fry's and[sic] CuCl <sub>2</sub> , ~10 min.
FB3BM9	Chemical etching process (6 x's), 5-10 sec's; Magnetic Particle Inspection (1x).
FGV7TM	Fry's Reagent, 3 or 4 minutes; Nitric Acid, 5 or 6 minutes.
FKJJXT	A- Using Regula Instrument Model 7505M: B- Acidic Method: Applying[sic] Fry's Solution (one coat) for 2 minutes.
FQDRUB	Reagents, 3 mins.
FUMPV2	Electro magnetic process is used. White background of laquer[sic] magnetic flow detection is applied on the obliterated area. Steel placed on the yoke, magnetize for few seconds. Black ink is applied and the[sic] left it for a few seconds to develop. Once number is developed it was recorded and photographed. Exhibit cleaned.
G2TYCW	Acid Etch: ~5-10 seconds at a time, etched for ~ 1 hour
G2ZMY6	Magnetic particle inspection "Magnaflux", 1 minute; Chemical etching "Fry's" reagent, 1 minute.
GNZLKJ	Fry's Reagent, about 1 minute or less for a total of approximately 10 applications.
GVXRFF	Electro acid etching process, 2 minutes.
GYLLMH	Phosphoric/Nitric Acid, 20 min; Acidic Ferric Chloride, 20 min; Fry's Reagent, 15 min.

TABLE 4

WebCode	Recovery Methods
HE6KEY	Electro-acid aching process, 2 to 3 min; The process begin with coupling of light electro current to the steel plate, the positive pole was attached to the steel plate, negative pole steel rod with a piece of cotton wool around the tip and dipped into acid solution every time the current flow through the wool and steel. [sic]
HPVKLY	Magnetic; Chemical, 10 minutes.
HU2TG8	Electro magnetic process, N/A.
J79M92	Magnetic Method "Magnaflux", five minutes; Chemical etching, Fry's Reagent, five minutes.
JBBHKL	1) Magnetic particle inspection using Magnuflux[sic] 7HF prepared bath and a magnetic yoke. 2) Fry's Reagent - Applied for ~30 seconds
JTV46C	Davis Reagent was applied with a time on material of 5 minutes and no results. Turner's Reagent was then applied with a time on material of 5 minutes and no results. Fry's Reagent was then applied and the serial number became legible in 2 minutes.
JYEC3	MPI/Magnaflux.
JZJL8X	Electro - magnetic process used. White background laquer[sic] magnetic flaw detection is applied on the area. Steel is placed on the yoke, magnetise[sic] for a few seconds, black ink is then applied leave it for few seconds to develop. Photo is taken and the results are recorded.
JZZPVX	I used electro-acid etching process and found the number the first time. +- 6 minutes.
K7LUAJ	Acidic method, in less than a minute a number was restored.
KF8Z3G	Filing pad, 3 min; Ferric Chloride, 10 min; Acidic Ferric Chloride, 5 min; Nitric Acid, 2 min.
KL7X2B	Chemotechnical etching using solutions containing hydrochloric acid, copper chloride and distilled water (2 solutions with different concentrations), 30 min.
KTE7WF	Electro-magnetic etching process, N/A; Electro-acid etching process, 10 seconds.
LU6PE8	Electro magnetic process, N/A.
M46KPE	Magnaflux, NA.
ME3NRM	Acidic Ferric Chloride, Ferric Chloride, Sodium Hydroxide. The reagents above were used one at a time. Applied using a cotton swab, the reagents were only on the bar stock for a matter of seconds as it was being applied.
MFZPZZ	Visual, N/A; Sanding, N/A; Turner's Reagent, 2-3 minutes; Fry's Reagent, 1-3 minutes.
MKGK4C	Fry's Reagent, <1 minute per application with a total of ~8 applications.
MLMN8Z	Polishing; Hubbal's[sic] Reagent, 3 min; Ferric Chloride, 10 min.
MR8Q9B	Fry's reagent; dipped cotton applicator in acid and wiped over area of obliteration. Indication of a number appeared after approx. 20 seconds. Continued for about 1-2

TABLE 4

WebCode	Recovery Methods
	minutes till[sic] number was visible.
MURTXV	Magna Flux.
MWZQM7	Polishing; Fry's, 10 minutes (total).
MYJ6Q8	Sanding; Ferric Chloride, >30 seconds; NaOH, >30 seconds; diluted Fry's, >30 seconds.
N2TA6V	HNO <sub>3</sub> (10%), 15 min.
NANEXW	Etching using Fry's reagent (7 times) 10s each time
NBN7DL	Acidic Method - Fry's reagent. Time on Material - approximately 3 minutes
NCXYAY	The surface of the exhibit has been processed with RESTOR-A-GEL STEEL (RAG- 1001 SIRCHIE). The exhibit has been processed with this gel three times. Once the gel was changing the color, old layer of the gel was being cleaned and replaced with new layer. Following serial number A3K9N3 has been recovered upon placing the third layer of the gel.
NHPGNK	Fry's Reagent, 5 minutes.
NZ4TJW	Electro Magnetic Process, N/A.
P292JX	Visual Exam (Microscopy), NA; Physical (sanding and polishing), NA; Turner's Reagent, ~30 sec - 1 min x2; Fry's Reagent, ~1 min - 3 mins x2.
PAK42M	etching using Fry's reagent, 15 min.
PGC8DY	acid etching process, +- 15 seconds.
PNT64X	MAGNETIC METHOD USED FOR RECOVERY WHICH IS ALLOWED TO REACT FOR 3 MINUTES.
Q2DJKC	Electro-acid etching process, + - 15 seconds.
Q7HM2X	Electro-magnetic process
QFCQD8	Electro-acid etching process, 10 minutes.
QHA7LZ	Chemical etching by Fry's Reagent - 1 min.
QKKUHN	Acid etching, +-2 min; Magnetic etching, +-1 min.
QMC62U	Electro-magnetic process
QNTMNA	Fry's (two cycles with a rinse/dry between), ~45 seconds total.
QPUCEV	The electro-magnetic method.
QRMMHZ	1) (after initial polishing) Acidic Ferric Chloride: approximately 1 minute. 2) 25% Nitric Acid: <1 minute. 3) (repolishing here) then Acidic Ferric Chloride: approximately 5 minutes. 4) 25% Nitric Acid: approximately 2 minutes. 5) Acidic Ferric Chloride: approximatley[sic] 10 minutes

TABLE 4

WebCode	Recovery Methods
QX3R2Z	Acidic Ferric Chloride, 60 sec; Bill Fort's Reagent, 30 sec.
QYG8F2	I tried 25% and 50% Nitric Acid for 5 minutes each and nothing happened. I then tried Acidic Ferric Chloride for about 5 minutes and the metal darkened. Next, I tried Davis for about 5 minutes and it dulled the surface of the metal. Finally I tried Fry's and after about 1 minute on the metal, the serial number started to show up. Within 5 minutes the serial number was completely restored.
QZBZBK	Chemical Restoration Procedure. Ferric Chloride, Acidic Ferric Chloride, 25% Nitric Acid, 10% Sodium Hydroxide
RCGNKU	Acid Etch Method (Fry's, Turner's and Acetone), ~5 Minutes.
RET2PK	Sanding/Polishing; Fry's, 60 seconds; Acetone; Fry's, 60 seconds.
RGRPGX	Chemical etching process, 3-5 mins.
RMQUZZ	Electro magnetic process; Electro acid etching process, Approx 5 min.
RVRFU	Fry's reagent, left for 5-10 seconds each time, total about 8-10 times
RYTJCX	Acetic Ferric Chloride - see below [Table 5: Additional Comments], Ferric Chloride, Fry's Reagent.
T22YFR	Electro-magnetic etching process
T9V8LL	Magnetic Particle Inspection (MPI80 Black), 1 minute
TM63MY	Turner's Reagent for Steel - 3 applications, ~5-10 minutes per.
TUMDZZ	20% Sodium Hydroxide, 1-5 seconds; 40% Sodium Hydroxide, 1-5 seconds; Polish with dremel & rubber wheel; Polish with 220 grit sandpaper; Fry's Reagent, 1-5 seconds.
TVUB3P	Electro-magnetic etching process
TWTVYV	Acidic method (reagent #1, for iron and steel, reagent fry) for 15 seconds. (Reagent #1: 135g copper chloride, 150 ml water and 180 ml cloridic[sic] acid).
TXVH4K	Acidic Ferric Chloride was used by swabbing. No time left on the item. Remainder of the etching was done with a dilution of the acidic ferric chloride by swabbing.
UMKNW2	Magnetic particle inspection (Magnaflux)
UXJR3P	Electro-magnetic etching process (only).
V3FEJL	Method 1 - Ferric Chloride for 2 to 3 minutes; Method 2 - Acidic Ferric Chloride for 2 to 3 minutes; Method 3 - 25% Nitric Acid for 2 to 3 minutes; and Method 4 - 10% Sodium Hydroxide for 2 to 3 minutes.
VBWTQX	50% Nitric Acid, 5 minutes; Acidic Ferric Chloride, 5 minutes; Fry's Reagent, 3 minutes
VKFC2G	swabbed Acidic Ferric Chloride on for 10 seconds. swabbed Acidic Ferric Chloride on for 10 seconds. swabbed Acidic Ferric Chloride on for 10 seconds. swabbed 20% Nitric Acid

TABLE 4

WebCode	Recovery Methods
	on for 10 seconds. swabbed Acidic Ferric Chloride on for 10 seconds. wiped chemicals off with Acetone. swabbed 20% Nitric Acid on for 10 seconds. swabbed 20% Nitric Acid on for 10 seconds. swabbed Acidic Ferric Chloride on for 10 seconds. swabbed Acidic Ferric Chloride on for 10 seconds. swabbed 20% Nitric Acid on for 10 seconds. wiped chemicals off with Acetone. Placed Rem-oil on area for lubrication
VLXEV6	Acedic Acid Ferric Chloride, 10 mins; Acedic Acid Ferric Chloride, 10 mins; Acedic Acid Ferric Chloride, 10 mins; Acedic Acid Ferric Chloride, 10 min; Fry's Reagent, 10 min. [sic]
VNDRA6	Swabbing of the obliterated serial number area with Fry's Reagent.
VQE2WV	Acidic Method - Heyn's Reagent (Cupric Ammonium Chloride)-approximately 15 minutes
VUADM2	I applied Magnavis to item #1 and then placed it on a magnet.
VWL7M4	Electro magnetic etching process, n/a.
VWW4EX	Phosphoric/Nitric Acid, approx 5 mins; Ferric Chloride, approx 10 mins; Phosphoric/Nitric, approx 5 mins; Acidic Ferric chlride[sic], approx 5-10 minutes
WPD2AB	Method: Fry's Reagent. Time: 5 min.
WPHJAU	Etch process
WVLHKK	Electro magnetic process: The object was sprayed with a thin layer of contrast spray. The surface left to dry for a few seconds, attached one leg of the yoke on either side. The area was magnetised for approximately 15 sec and applied +- 2 drops of magnetic suspension. The surface kept horizontally until the number developed.
X982VF	Acid Etching, + - 3 minutes.
XAYBNG	The Electro-magnetic method
XG28NG	Electro-acid etching process was used. I switched on the voltmeter to a desired voltage, plug the contact points of two conducting wires red and black, attached the crocodile clips to the object to be etched, put a piece of cotton wool around the cliper point of the black conducting wire soak it into the acid and apply to the area where the number was removed, The acid was on the material for plus minus 3 minutes. [sic]
XGGL2H	Magnetic Etching Process
XRENYQ	25% Nitric, ~5 minutes; Davis, ~3-5 minutes; Turner's, ~5 minutes; Fry's, ~2 minutes.
XUNGC8	Adler's Reagent II (HCl, FeCl <sub>3</sub> ·6H <sub>2</sub> O, NH <sub>4</sub> Cl, CuCl <sub>2</sub> ) digestion - 5 min.
XYKK9Q	CLEANING THE SURFACE; POLISH THE METAL; CLEANING THE REST OF THE SURFACE AND CHEMICHALS; FRY'S REAGENT (45 GR. CUCL 2.60ML HCL.50 MG H2O), 15 MINUTES [sic]
XZHPAP	Restor-A-Gel, approximately 45 minutes on material.
YAX66R	Acidic Ferric Chloride ~ 11 applications for various amounts of time, ~30 to 40 minutes



TABLE 4

WebCode	Recovery Methods
	total time.
YB2LUM	MAGNAFLUX
YFZYVM	Electro-magnetic process
YQTEJU	Fry's Acidic method #2 was used on the surface of Item 1 and after approximately 30 minutes the digits of the SN# began to surface. After applying and reapplying the solution, the SN# was readily visible after approximately one hour.
YQUDBG	THE METHOD USED: 1. POLISHING TOOL 2. ACIDIC ETCHING METHOD USING FRY'S REAGENT FOR 7 MINUTES.
YTL8ED	Ferric Chloride 1, seconds; Acidic Ferric Chloride 2, seconds.
YXDGLQ	10% Nitric Acid, ~15 seconds; 10% Nitric Acid, ~30 seconds; (Fry's Reagent - not on SN area - see notes [Referenced notes were not provided by participant]), ~20 seconds; 10% Nitric Acid, ~5 minutes; Magnaflux, N/A.
YY83G3	Buffed; Frye's[sic] Reagent, 1 minute.
ZMHJHZ	Acidic Ferric Chloride, 30 sec
ZTDREH	ACIDIC METHOD 15 MIN

<b>Response Summary</b>		<b>Participants: 174</b>
<b>Recovery Methods</b>		
<b>Chemical Processing:</b>	<b>110</b>	
<b>Magnetic Processing:</b>	<b>47</b>	
<b>Combined Magnetic and Chemical Processing:</b>	<b>17</b>	

# Additional Comments

TABLE 5

WebCode	Additional Comments
2R843K	Obliterated serial number restored with magnetic particle inspection. Fry's reagent utilized to set for potential photo documentation.
2URC67	The restored serial number for Item #1 was digitally photographed and will be included with the case file.
43LK9W	The six (6) alphanumeric character series "A3K9N3" was observed during the visual examination, however difficult to record photographically. As such, the serial number restoration process continued to chemical treatment for the purpose of enhancing visualisation. The serial number observed was confirmed by a second firearm examiner.
4HER2Y	The above methods [Table 4: Recovery Methods] were used in order multiple times to produce serial number.
6B9XMM	No acidic methods used
6CD886	The acids were not left on the material. Cotton swabs were used by sweeping them across the surface with the acids.
6XYZC2	Time was not observed for acidic method(s)
7ACYNE	A good positive result was obtained during the first attempt and therefore only the Magnetic particle inspection was applied.
7NTZHK	The aluminum bar standard was accounted for as an item since it was submitted in the same box as the stainless steel bar stock.
8WKWKD	Using the magnetic method can see the position of making up the serial characteres, however it is not clear in some of the characters revealed, so for example the number three seems to eight. Using the Fry's method clearly showed all the characters of the serial. [sic]
9A2MYF	The stainless steel bar stock cannot be magnetised, however the serial number appears while placed on the magnet with the application of the magnetic suspension.
A9H68K	If this was an actual firearm, and NCIC search would have been performed and the results reported as follows: An NCIC search of this serial number revealed ( __result of search __).
AC9PHJ	The results obtained are set by digital photography. In the chemical method or destructive method the result was obtained in about 15 minutes leaving the reagent to act 50 minutes more. The characters of the result obtained are very similar in size and morphology to the printed samples of test N°. 14-5251 - (aluminum standard)
CRWLWJ	Photographs were taken of the serial number retoration[sic] during the process.
DE8ZCK	The process of polishing and the use of chemical etchants is documented in my case notes. Photographs were taken of the obliterated serial number as received, after polishing and after the restoration.
EWZ3YD	The electro magnetic process was used and the recovered number is A3K9N3.

TABLE 5

WebCode	Additional Comments
EX9YL3	Solution used for electro-acid etching process. 50ml HCL - Hydrochloric acid, 50ml H <sub>2</sub> O - distilled water, 5 grams CuCl <sub>2</sub> NHCl <sub>2</sub> HO - Copper (II) ammonium[ <i>sic</i> ] copper
FKJJXT	A- Using Regula Instrument Model 7505M: Partial Recovered Serial Number : A3K?N?. B- Acidic Method: Recovered Serial Number: A3K9N3
G2ZMY6	The erased area by erasing system is 0,40 mm. I'd like to know the depth of the impression, to establish the ranges between the total erased and surface where appear the serial number by the methods used in this test.[ <i>sic</i> ]
GYLLMH	All reagents utilized.
HE6KEY	After the restoration process the serial number was recovered oil to clean or to neutralize the acid in the steel plate and placed all the equipment in allocated storage facility after use. [ <i>sic</i> ]
HPVKLY	Methods: 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: 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.
J79M92	In most cases they use the magnetic method must be confirmed by the chemical method.[ <i>sic</i> ]
JZZPVX	The acid solution mentioned in paragraph 3 [Table 3: Sample Preparation] is also known as Green Mamba.
KL7X2B	The method "Serial Number Restoration" is accredited according to ISO 17025.
KTE7WF	With both the methods I have found the serial number to be A3K9N3.
LU6PE8	The stainless steel bar stock was not sticking to the Gammatech machine (not magnetised) but I retrieve the number using it.
MWZQM7	Total restoration took approx. 10 minutes of swabbing/reading.
NZ4TJW	*I did not polish the area to smooth the surface, the maximum obliterated surface was to be kept to ensure a better chance to retrieve the obliterated number. Photo's were taken as proof of the obtained result and file in my case file.
QFCQD8	The serial number consists of a Numbers and Alphabets.[ <i>sic</i> ]
QMC62U	After etching, cleaned the exhibit with acetone and oiled lightly.
QZBZBK	Digital photographs were taken prior to processing, during and at completion.
RYTJCX	The longest period at any one time was ~five minutes. Toward the end of the process a swab of the etching solution may have been left on the surface 5-10 seconds for visualization.

TABLE 5

WebCode	Additional Comments
TUMDZZ	The metal sample was reported to be stainless steel, however the known standard provided was aluminum. A known standard of stainless steel instead of aluminum would be helpful.
WVLHKK	After restoration of the serial number the object was cleaned and sealed in a forensic bag.
XG28NG	I found that the steel plate was not magnetic when placed on the magnetic yolk, hence magnetic etching process was not done. The numbers that were recovered were noted down on the 212 statement.
XYKK9Q	TEST WAS CHALLENGINE VERY CLEAR AND EVERYTHING WENT WELL.[sic]
YQTEJU	The restored SN# A3K9N3 was easily photographed and was still visible on the surface of Item 1 after concluding the analysis.

# Appendix: Data Sheet

Collaborative Testing Services ~ Forensic Testing Program

## Test No. 14-5251: Serial Number Restoration

DATA MUST BE RECEIVED BY November 17, 2014 TO BE INCLUDED IN THE REPORT

Participant Code:

Webcode:

### Accreditation Release Statement

CTS submits external proficiency test data directly to ASCLD/LAB and ANSI-ASQ NAB/FQS. 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 ANSI-ASQ NAB/FQS. (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 ANSI-ASQ NAB/FQS.

### Online Data Entry

Visit [www.cts-portal.com](http://www.cts-portal.com) to enter your proficiency test results online. If you have any questions please do not hesitate to contact CTS.

Please Note: A piece of aluminum bar stock is also included in the sample set and is intended as a standard for size, shape and positioning of the stamped alphanumeric characters used in the serial number.

#### Items Submitted (Sample Pack SNR2):

Item 1: Piece of stainless steel bar stock with suspected obliterated serial number.

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

The serial number on this material consists of 6 characters.

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

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

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Please return all pages of this data sheet.

Page 1 of 3

Participant Code:

Webcode:

Additional Testing Information

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

Five horizontal lines for text entry.

4.) What methods of recovery were used during your examination?  
(Please list in order of use)

Method

If an acidic method was used how long was the acid left on the material?

Two columns of five horizontal lines each for text entry.

5.) Additional Comments

Five horizontal lines for text entry.

**Return Instructions:** Data must be received via online data entry, fax (please include a cover sheet), or mail by *November 17, 2014* to be included in the report.

QUESTIONS?

TEL: +1-571-434-1925 (8 am - 4:30 pm EST)

EMAIL: [forensics@cts-interlab.com](mailto:forensics@cts-interlab.com)

[www.ctsforensics.com](http://www.ctsforensics.com)

Participant Code:

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

FAX: +1-571-434-1937

or Toll-Free: 1-866-FAX-2CTS (329-2287)

MAIL: Collaborative Testing Services, Inc.

P.O. Box 650820

Sterling, VA 20165-0820 USA

Please return all pages of this data sheet.

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## RELEASE OF DATA TO ACCREDITATION BODIES

The following Accreditation Releases will apply only to:

Participant Code:

Webcode:

for Test No. **14-5251: Serial Number Restoration**

This release page must be completed and received by **November 17, 2014** 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) \_\_\_\_\_

### **ANSI-ASQ NAB/FQS RELEASE**

If your laboratory maintains its accreditation through ANSI-ASQ NAB/FQS, please complete the following form in its entirety to have your results forwarded.

ANSI-ASQ NAB/FQS 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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