## **Firearms Section**



Serial Number Restoration Methods

#### 1. <u>Scope</u>

Methods for the restoration of obliterated serial numbers, vehicle identification numbers (VIN), or other.

#### 2. <u>Safety</u>

Appropriate safety equipment will be utilized when making and using these chemicals. Eye protection, lab coat, and nitrile gloves will be worn. Reagents will be made in the fume hood or with the use of the fume extractor.

#### 3. <u>General Examination</u>

- 3.1 Take notes reflecting your examinations and findings. If deviations are necessary, they will be approved by the section supervisor prior to implementing.
- 3.2 Examine evidence to determine if the serial number exists in more than one location or if there are numbers on the items that can be linked back to the VIN number by way of the manufacturer.
- 3.3 Refer to resources to gain information as to the serial number appearance, size, shape, and number of digits.
- 3.4 Record the condition of the serial number as received.
- 3.5 Use the appropriate reagents for the substrate.
- 3.6 Sand and/or polish the obliterated area to a smooth finish. Examine the area to determine if polishing alone can reveal the serial number.
- 3.7 Use Magnaflux and/or chemical etching solutions.
- 3.8 Numbers obliterated in wood may be restored by sanding the area and using a steam iron.
- 3.9 The final step that can be employed on steel is heating the metal with a torch until it is glowing red. Once cooled, the number may be visible, but this destroys success of additional processing.

#### 4. <u>Chemical Etching Reagents</u>

#### 4.1 Ferrous (Iron and Steel)-Magnetic media

- 4.1.1 <u>Magnetic Partical Inspection</u> Magnaflux A Magnet
- 4.1.2 <u>Fry's Reagent</u>

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90 grams Cupric Chloride (CuCl2) 120 ml Hydrochloric Acid (HCl) 100 ml Water (H20)

- 4.1.3 <u>Turner's Reagent</u>
  2.5 grams Cupric Chloride (CuCl2)
  40 ml HCl
  25 ml Ethyl Alcohol
  30 ml H20
- 4.1.4 <u>Davis Reagent</u> 5 grams Cupric Chloride 50 ml HCl 50 ml H20
- 4.1.5 <u>25% Nitric Acid</u> 25 ml Nitric Acid (HNO3) 75 ml H2O

#### 4.2 Nonferrous Metals -Non-magnetic

- 4.2.1 <u>Acidic Ferric Chloride</u> 25 grams Ferric Chloride (FeCl3) 25 ml HCl 100 ml H2O
- 4.2.2 <u>Ferric Chloride</u> 25 Ferric Chloride (FeCl3) 100 ml H2O
- 4.2.3 <u>10% Sodium Hydroxide</u> 10 grams Sodium Hydroxide 90 ml H2O
- 4.2.4 <u>Phosphoric/Nitric Acid</u> 98 ml 85% Phosphoric Acid 2ml concentrated Nitric Acid or 50 ml Phosphoric Acid 3 ml Nitric Acid (concentrated)

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4.3 These chemicals will be logged into the Chemical log. They do not have an expiration date. Before each use, they will be tested to ensure they are working properly.