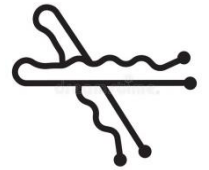




Pin-tumbler Lock Toolmark Examination and Trace Analysis



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Introduction



Crime Scene 1
June 2019





Introduction

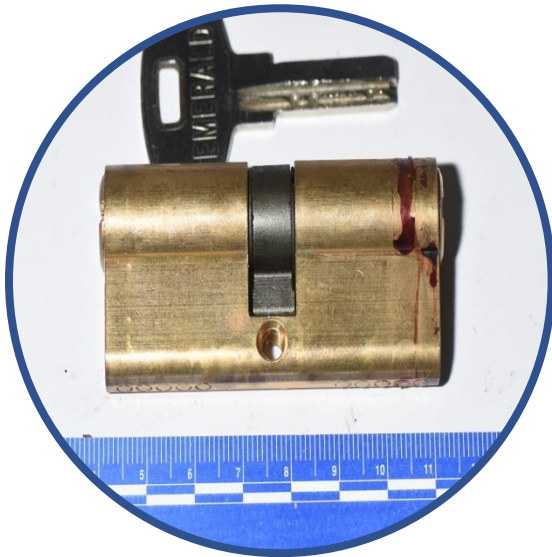


Crime Scene 1
June 2019



Crime Scene 2
July 2019

Introduction



Crime Scene 1
June 2019



Crime Scene 2
July 2019



Introduction



Suspected Tools
July 2019



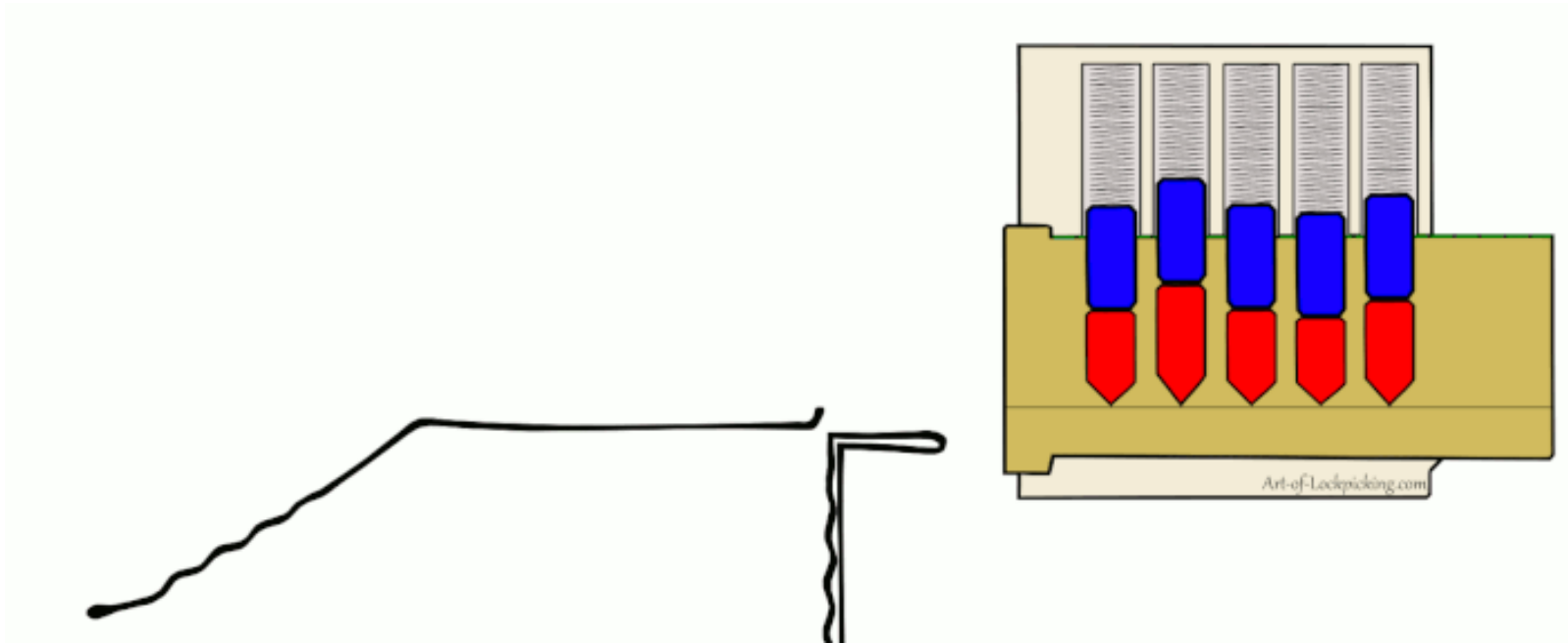


Introduction



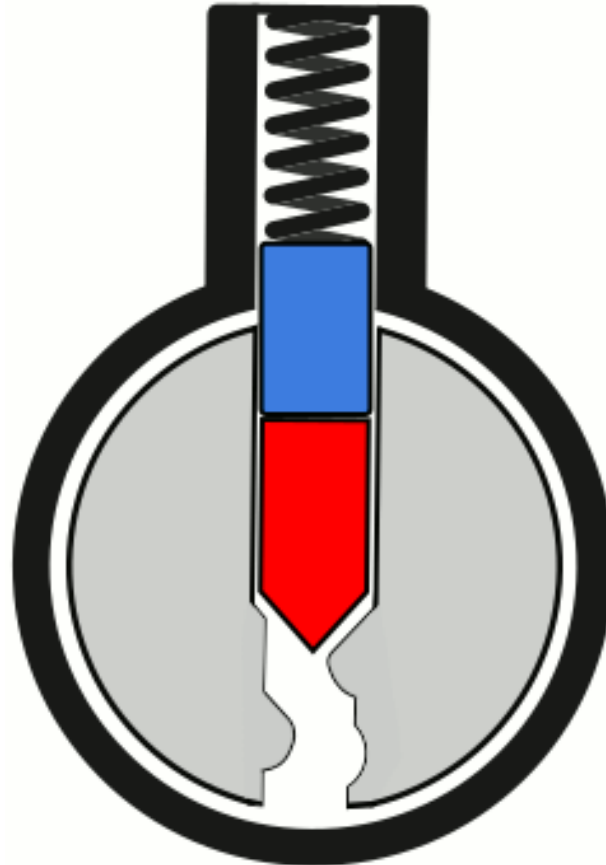


Introduction





Introduction





Methodology

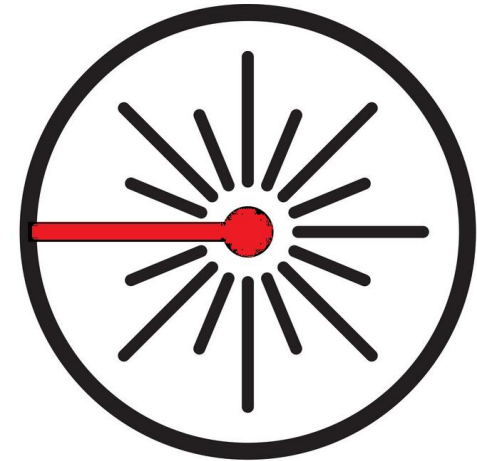
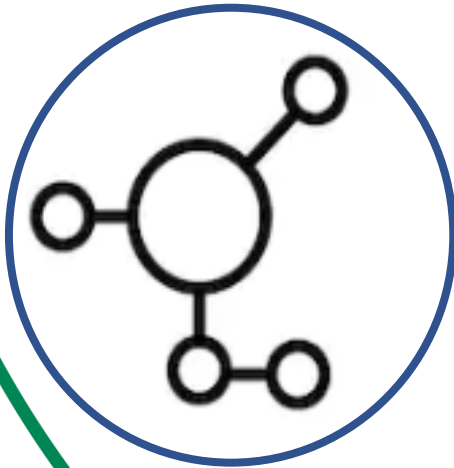
Microscopic Analysis



FTIR Analysis



SEM/ EDX Analysis





Results

1- Stereo microscope analysis revealed:

No picking marks on combination pins from crime scene 1.

Picking marks on combination pins from crime scene 2.

2- FTIR analysis revealed:

No similar spectra was found when comparing the combination pins picking marks with each other.

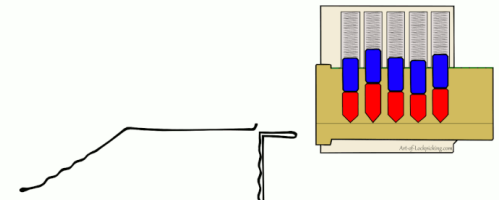
No similarities were also found when compared with (reference) bobby pin spectra.

Results

3- SEM/ EDX analysis revealed:

(Combination Pins Reference)

C-Carbon, Cu-copper, Zn-zinc, O-oxygen

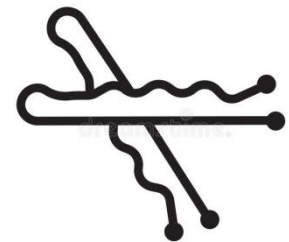


(Picking Marks on Combination Pins)

C-Carbon, Cu-copper, Zn-zinc, O-oxygen, Fe-iron, Ca-calcium

(Not Used Bobby Pins)

C-Carbon, O-oxygen, Fe-iron, Ca-calcium



(Used Bobby Pins)

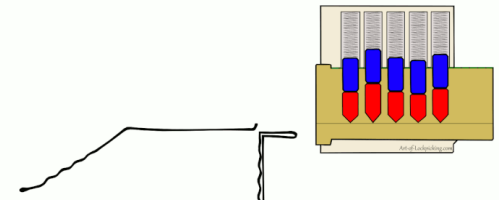
C-Carbon, O-oxygen, Fe-iron, Ca-calcium, Cu-copper

Results

3- SEM/ EDX analysis revealed:

(Combination Pins Reference)

C-Carbon, **Cu-copper**, Zn-zinc, O-oxygen

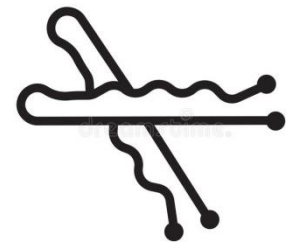


(Picking Marks on Combination Pins)

C-Carbon, **Cu-copper**, Zn-zinc, O-oxygen, Fe-iron, Ca-calcium

(Not Used Bobby Pins)

C-Carbon, O-oxygen, Fe-iron, Ca-calcium



(Used Bobby Pins)

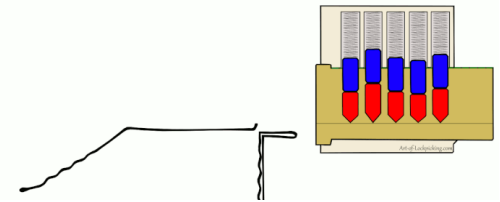
C-Carbon, O-oxygen, Fe-iron, Ca-calcium, **Cu-copper**

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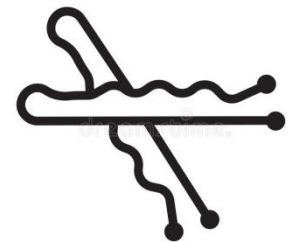


(Picking Marks on Combination Pins)

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(Not Used Bobby Pins)

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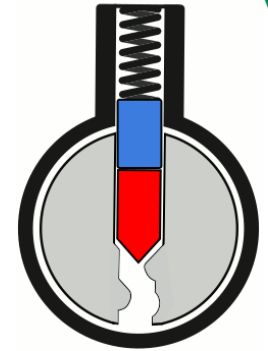


(Used Bobby Pins)

C-Carbon, O-oxygen, **Fe-iron, Ca-calcium**, Cu-copper

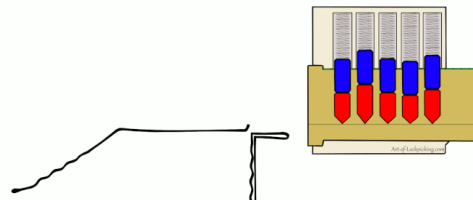
Limitations

- Picking marks on the **Cylinder Plug Walls** were not reached.



Lessons Learned

- Combination Pin **Location** should be documented.
- Picking marks are associated with |





Acknowledgment

**Firearm and Toolmark Section & Trace Evidence
Section**

**Gen. Dept. of Forensic Science and Criminology
Dubai Police**





Q/A + Suggestions

