

# Denver Police Department Trace Analysis Unit

## Gunshot Primer Residue, A Quantitative Question?

Denver Police Department Crime Laboratory

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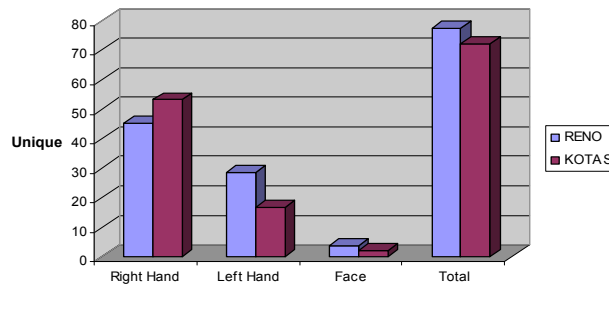


Through photographic evidence of the soot cloud produced by the discharge of a revolver we had always assumed that a revolver would deposit more GSR than a semi-automatic pistol.

The results of this study do not confirm that theory. On average, 77 unique particles were detected on the three samples from the six revolver discharges, whereas, 72 particles were detected from the semi-automatic pistol. The average number of unique particles found on the right hand discharge samples from the semi-auto pistol was 53 particles, while the average number of particles on the right hand from the revolver discharge was 46 particles. The number of unique particles found on the right hand samples from the semi-automatic discharge was consistently higher than the number of particles detected on the left hand. Only 50% of the right hand samples from the revolver discharges were higher than the left hand.

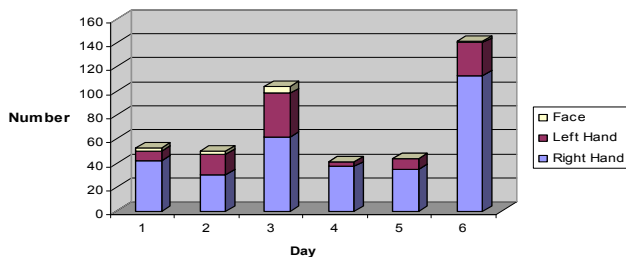
The total particles detected ranged from 22 to 194 for the revolver and 41 to 141 for the semi-automatic pistol. Of all the unique particles detected approximately 20% were spherical. Unique particles were found on 10 of the 12 face samples.

Average Number of Particles



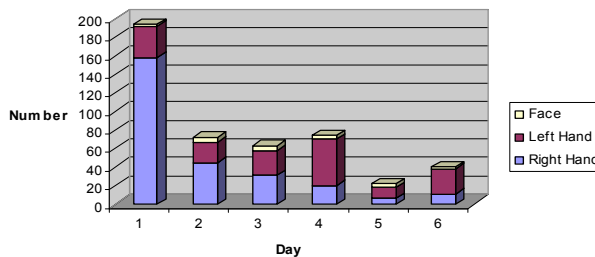
<b>RENO</b>	<b>46</b>	<b>29</b>	<b>4</b>	<b>77</b>
<b>KOTAS</b>	<b>53</b>	<b>17</b>	<b>2</b>	<b>72</b>

KOTAS Unique Particles Semi-Automatic



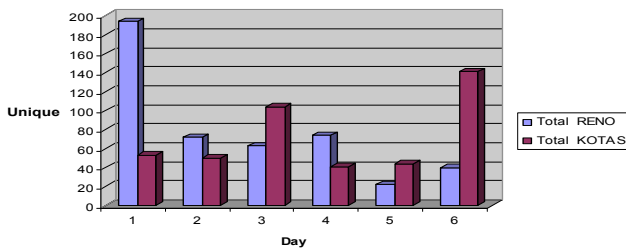
<b>Right Hand</b>	<b>42</b>	<b>30</b>	<b>62</b>	<b>37</b>	<b>35</b>	<b>113</b>
<b>Left Hand</b>	<b>8</b>	<b>17</b>	<b>36</b>	<b>4</b>	<b>9</b>	<b>27</b>
<b>Face</b>	<b>3</b>	<b>3</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>1</b>
<b>Total KOTAS</b>	<b>53</b>	<b>50</b>	<b>104</b>	<b>41</b>	<b>44</b>	<b>141</b>

RENO Unique Particles Revolver



<b>Right Hand</b>	<b>158</b>	<b>45</b>	<b>31</b>	<b>20</b>	<b>6</b>	<b>11</b>
<b>Left Hand</b>	<b>34</b>	<b>22</b>	<b>27</b>	<b>50</b>	<b>12</b>	<b>27</b>
<b>Face</b>	<b>2</b>	<b>5</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>2</b>
<b>Total RENO</b>	<b>194</b>	<b>72</b>	<b>63</b>	<b>74</b>	<b>22</b>	<b>40</b>

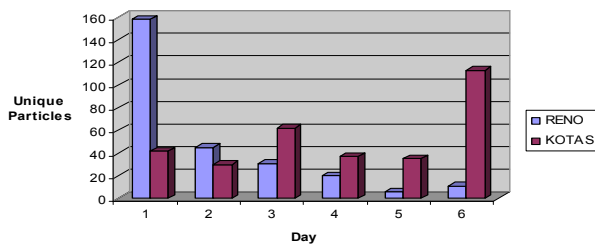
Right Hand + Left Hand + Face



<b>RENO</b>	<b>194</b>	<b>72</b>	<b>63</b>	<b>74</b>	<b>22</b>	<b>40</b>
<b>KOTAS</b>	<b>53</b>	<b>50</b>	<b>104</b>	<b>41</b>	<b>44</b>	<b>141</b>

**RENO – Revolver    KOTAS – Semi Auto**

Right Hand Only



<b>RENO</b>	<b>158</b>	<b>45</b>	<b>31</b>	<b>20</b>	<b>6</b>	<b>11</b>
<b>KOTAS</b>	<b>42</b>	<b>30</b>	<b>62</b>	<b>37</b>	<b>35</b>	<b>113</b>

Many thanks to our firearms examiners for their help with the project.  
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