B54 Transporting or Tracking Ignitable Liquids in Fire Scenes

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The goal of this presentation is to evaluate the extent to which transporting or "tracking" of identifiable ignitable liquids into fire scenes occurs and offer the results of the evaluation for those conducting scientific evaluations of fire incidents.

In the investigation of fire scenes, it is often important to determine if ignitable liquids or liquid accelerants, e.g., gasoline, have been used. The procedure involves collecting of debris samples and submitting them to an analytical laboratory. If positive results are found, it may later be necessary for the investigator to defend in court the collection procedure used. It is occasionally claimed by individuals accused of incendiarism that the gasoline residues found by the laboratory were not, in fact, present initially at the fire scene but comprise an artifact. Specifically, it has been claimed that fire investigation personnel may have entered the fire scene having first walked through some ground surface which was contaminated with gasoline, for example, a driveway on which a gasoline spill had taken place. This type of claim has never been subjected to scientific examination, thus the purpose of this work was to create spills, have fire investigation personnel walk through these spills, then take samples at various locations to determine if sufficient residues can be found to obtain positive laboratory results. The locations sampled corresponded to the footprints of the investigator directly upon leaving the spill area. Furthermore, claims have also been made that canines used for fire accelerant detection may also either themselves track in sufficient contamination to cause false-positive response, or to incorrectly alert on material that was tracked in and not originally present. Thus, trained canines were also used in the same series of tests.

Tests have been performed to determine whether the boots or shoes of individuals on the fire scene can track sufficient contaminants into a fire scene to obtain a false-positive laboratory result for presence of gasoline at the fire. Questions about the validity of forensic laboratory results have sometimes been raised on the basis that gasoline residues found in the laboratory samples could have been due to transport by footwear contaminated from walking over contaminated areas. The laboratory results establish that this will not lead to false positives being reported. Canines trained for detection of trace ignitable liquid residue were also utilized in the test work. The results indicate that properly trained canines show a higher sensitivity than do standard laboratory techniques for fire debris analysis.

The results obtained in this study disprove that claim that false-positive results are likely to obtained from laboratory testing of fire-debris samples due to contamination from the footwear of personnel. In the present study, large quantities of fuel (and in some cases, exceedingly large) were poured into the stepping area through which the investigator walked prior to entering the test area. In two of the four tests, furthermore, the fuel was "raw," that is, it was neither burned nor given time to evaporate. Yet laboratory results were uniformly negative, apart from samples taken from the pour location itself. The laboratory correctly identified the Test 1, 3, and 5 samples as "raw" and Test 2 and 4 samples as "weathered" gasoline. Consequently, it is concluded that even significant carelessness by a fire investigator in entering the fire scene with contaminated shoes will not track in sufficient gasoline that false-positive results would be obtained.

Boots and Shoes, Contaminants, Fire Accelerants

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