



Criminalistics Section – 2007

B84 Who Knew? Cigarettes and Gasoline Do Mix?

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After attending this presentation, attendees will be able to dispel one of the common myths associated with the ignition of gasoline; to explain fire characteristics that impact the ignition of gasoline by a cigarette coal; and to illustrate the results of testing.

This presentation will impact the forensic community and/or humanity by dispelling the notion that cigarettes readily ignite gasoline. The presentation will provide more than anecdotal information about the phenomenon.

It is commonly believed that throwing a lit cigarette into a pool of gasoline will readily ignite the fuel. While often depicted on television and in movies, this is just another "fire investigation myth" that is used by suspects to explain how they "accidentally" lit a loved one or structure on fire.

The coal temperature of a lit cigarette is approximately 680 – 700 degrees Celsius. The autoignition temperature of gasoline is approximately 246 degrees Celsius, well below the cigarette temperature. Why is ignition not likely? A number of phenomena effect whether the gasoline will ignite.

There is no proven theory about all aspects of the phenomena that govern whether ignition will take place using a cigarette. Without a governing theory or law, one is attempting to prove a negative. This requires lots of experiments to begin to demonstrate whether ignition will occur.

The presentation will outline the theoretical considerations and discuss the results of over 2000 attempts to ignite gasoline with a cigarette. Experiments were conducted under different ambient temperature and humidity conditions. Attempts were made with cigarettes under draw and at rest. Targets were varied. Cigarettes were introduced into gasoline pools, next to gasoline pools, above pools and gasoline was atomized around the cigarette. Various textile substrates soaked in gasoline were also used as "wicks."

Gasoline, Cigarettes, Ignition