



### A166 National Center for Forensic Science and Technical Working Group for Fire and Explosions Databases

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The goal of this presentation is to inform attendees of the valuable fire debris and explosives analyses resources available in the National Center for Forensic Science and Technical Working Group for Fire and Explosions (NCFS/TWGFEX) databases.

This presentation will impact the forensic science community by providing information on the analytical data and product information contained within three databases: Ignitable Liquids Reference Collection Database, Substrates Database, and Smokeless Powders Database.

In 2000, the Ignitable Liquids Reference Collection (ILRC) and Database were established as a joint project between the National Center for Forensic Science (NCFS) and the Technical Working Group for Fire and Explosions (TWGFEX). The need for a collection of reference ignitable liquids with associated GC-MS analysis data was confirmed by fire debris analysts in a 1998 national survey of forensic laboratories.<sup>1</sup> The collection of reference ignitable liquids and the database of GC-MS analysis data are housed at NCFS. The ILRC committee, a committee within TWGFEX, reviews all of the data and classifies each reference ignitable liquid based on the American Society for Testing and Materials (ASTM) E1618 – 06 classification scheme.<sup>2</sup> The ILRC database contains product information, classification information, and GC-MS data. The

ILRC database became accessible to the public with 100 entries in January 2002 and now contains over 500 entries.

In 2007, NCFS and the ILRC committee began investigating the feasibility of establishing a substrate database. Substrates are materials which undergo pyrolysis and combustion processes during a fire and are constituents in fire debris collected at a fire scene. These materials may produce compounds that can interfere with the identification of ignitable liquids in fire debris. A modified destructive distillation method is utilized in producing burned substrates for analysis. The Substrate Database is a compilation of headspace GC/MS data from burned and unburned materials that are common to fire scenes. The database can assist fire debris analysts by demonstrating the types of compounds and chromatographic patterns that may be produced by these commonly encountered materials. The Substrate Database became accessible to the public with 60 entries in July 2010.

In 2009, NCFS and the explosives database committee of TWGFEX began developing a database for smokeless powders. The Smokeless Powders Database will be a compilation of product information, physical descriptions and analytical data on smokeless powders from three main sources. The FBI and Orange County Sheriff-Coroner Department in California will provide historical information and data on smokeless powders preceding the development of the database. NCFS will continue to populate the database with information and data on newer smokeless powders. A prototype of the database has been approved by the TWGFEX explosives committee. It is anticipated that the Smokeless Powders Database will be accessible to the public with 100 entries by January 2011.

Over the last decade, combined efforts from the National Center for Forensic Science and the Technical Working Group for Fire and Explosions have developed three databases; the Ignitable Liquids Reference Collection Database <http://ilrc.ucf.edu>, the Substrate Database <http://ilrc.ucf.edu/substrate>, and the Smokeless Powders Database. The databases are designed for the user to search product information, classification information, physical descriptions and analytical data rapidly. These databases are valuable tools in the investigation and analysis of fire debris and explosives.

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#### Reference:

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#### Databases, Fire Debris, Explosives