B29   Defining and Explaining Comparative Spectral Differences Within the Organization of Scientific Area Committee's (OSAC's) Trace Materials Standards

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Learning Overview: The goal of this presentation is to educate and inform the trace evidence community on a consensus approach to describing visual evaluation of comparative spectral data.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by sharing information that has been in discussion in the OSAC Trace Materials Subcommittee as to an appropriate and more uniform approach to evaluating and recording the results and interpretation of comparative spectral data analysis.

In this presentation, attendees will learn why the Trace Materials Subcommittee of OSAC has begun to implement a new term to describe differences observed between items being compared. This term is "exclusionary difference" and is defined as "a difference in a feature or property between compared items that is substantial enough to conclude that they did not originate from the same source." Included with this definition are two notes that are used to further clarify the inclusion of both statistical and non-statistical evaluations within the context of this term. The first note reads as: "An exclusionary difference is statistically supported when an appropriate statistical analysis shows a result outside the range of what usually occurs when the items originate from the same source." The second note is: "When a statistical analysis is not suitable, an exclusionary difference can be determined by expert judgment."

The use of the word "exclusion(ary)" is intended to align with the legal community's understanding of this term: to indicate that two or more items could not share a common source. The two notes were added so that it is clear that regardless of how the exclusion is made, the expert opinion is an elimination of common origin.

This term is being included throughout all current draft documents originating from the Trace Materials Subcommittee and will be used to replace the term "meaningful difference" in previously issued documents as well. It is expected to also be implemented in other OSAC disciplines, where applicable.

It is recognized that defining an exclusion is only one piece of the interpretation guidance necessary to compare data. Most trace evidence is still evaluated exclusively or in part using visual comparison of the graphical data. To this end, the Trace Materials Subcommittee has developed and approved a template of language to describe how spectral overlays are evaluated for distinguishability. Regardless of the methodology used to collect spectral data, the process is being inserted into the spectral evaluation section of Trace Materials documents to explain how spectral comparisons are assessed and how that data fits into the overarching analytical scheme used to examine and compare materials.

This language and examples will be presented to demonstrate how the terms and their definitions appear in the American Society for Testing and Materials (ASTM) standards originating from the Trace Materials OSAC subcommittee. It is hoped that more consistent language across trace evidence technique-based documents will provide clarity as to the strengths and limitations of comparative trace examinations.

OSAC, Trace Materials, Comparison Language

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