Implementation of 3D Technologies in Forensic Firearm and Toolmark Comparison Laboratories, First Edition, 2021

WHAT IS AN AAFS STANDARD FACTSHEET?

The AAFS produces clear, concise, and easy to understand factsheets to summarize the contents of technical and professional forensic science standards on the OSAC Registry. They are not intended to provide an interpretation for any portion of a published standard.

WHAT IS THE PURPOSE OF THIS STANDARD?

The standard describes the necessary steps to ensure the proper implementation of 3D technologies (e.g., software and/or hardware) and technical procedure(s) required in a forensic toolmark laboratory.

This document details validations that shall be completed prior to the use of new 3D technology in casework examinations. It also describes ongoing performance checks and user training to ensure the reliability of results.

This standard is intended to be used alongside those related to 3D measurement hardware (ANSI/ASB Standard 061) and software (ANSI/ASB Standard 062).

WHY IS THIS STANDARD IMPORTANT? WHAT ARE ITS BENEFITS?

This standard establishes implementation guidance for 3D technologies in a forensic laboratory. It outlines the validation, ongoing performance checks, training, and competency/proficiency tests required to successfully implement toolmark comparisons using 3D technology. Adherence to the standard ensures the production of reliable data and statistically-based conclusions.

The standard is applicable to all forensic science service providers that issue conclusions regarding toolmark-related evidence (e.g., Firearms).

HOW IS THE STANDARD USED AND WHAT ARE THE KEY ELEMENTS?

This standard describes the structure of validation and ongoing performance checks of 3D technology. The specifics of this document's general framework are outlined in the related documents covering 3D measurement hardware (ANSI/ASB Standard 061, Firearms and Toolmarks 3D Measurement Systems and Measurement Quality Control) and software (ANSI/ABS Standard 062, Standard for Topography Comparison Software for Toolmark Analysis). The document discusses three validation stages: *Developmental validation*, *deployment validation*, and *ongoing performance checks*. Developmental validation takes place at least once, to establish the core operational elements of the technology. Each laboratory conducts their own deployment validation during the initial implementation of a new technology. Each laboratory also conducts ongoing quality/performance checks at regular intervals to demonstrate instrument and procedure reliability.

Development and deployment validations are evaluated by a described technical reviewer. The standard provides guidance for each validation, including who should perform these validations, how validations shall be structured, and that implementation shall be documented.

ANSI/ASB Standard 063 includes guidance on ongoing documented performance checks. It also describes user training, competency testing, and proficiency testing. Finally, the standard describes how to handle quality control failures.

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