

Implementation of 3D Technologies in Forensic Firearm and Toolmark Comparison Laboratories



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 for proper implementation of 3D technologies (e.g., software and/or hardware) and technical procedure(s).

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 support reliable results.

This standard is intended to be used alongside those related to 3D measurement hardware ([ANSI/ASB 061, 1st Ed., 2021](#)) and software ([ANSI/ASB 062, 1st Ed., 2021](#)).

WHY IS THIS STANDARD IMPORTANT? WHAT ARE ITS BENEFITS?

This standard establishes implementation requirements for 3D technologies by a forensic science service provider (FSSP). 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 FSSPs 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 061, 1st Ed., 2021](#)) and software ([ANSI/ASB 062, 1st Ed., 2021](#)). Validation is discussed in three 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 FSSP conducts their own deployment validation during the initial implementation of a new technology. Each FSSP 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 requirements for each validation, including who should perform these validations, how validations shall be structured, and that implementation shall be documented.

Requirements related to ongoing documented performance checks, user training, competency testing, proficiency testing, and how to handle quality control failures are also covered.

