NIST Handbook 150-24
2021 Edition

NVLAP
Law Enforcement and Corrections Equipment

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National Institute of Standards and Technology
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National Voluntary Laboratory Accreditation Program
Standards Coordination Office
Laboratory Programs

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NVLAP AND THE NVLAP LOGO

Contents

Foreword

The NIST Handbook 150 publication series sets forth the procedures, requirements, and guidance for the accreditation of testing and calibration laboratories by the National Voluntary Laboratory Accreditation Program (NVLAP). The series comprises the following publications:

- NIST Handbook 150, *NVLAP Procedures and General Requirements*, which contains the general procedures and requirements under which NVLAP operates as an unbiased third-party accreditation body;

- NIST Handbook 150-xx program-specific handbooks, which supplement NIST Handbook 150 by providing additional requirements, guidance, and interpretive information applicable to specific NVLAP laboratory accreditation programs (LAPs).

The program-specific handbooks are not stand-alone documents, but rather are companion documents to NIST Handbook 150 and the referenced ISO/IEC 17025 requirements. They tailor the general criteria found in NIST Handbook 150 and ISO/IEC 17025 to the specific tests, calibrations, or types of tests or calibrations covered by a LAP.

NIST Handbook 150-24, *NVLAP Law Enforcement and Corrections Equipment*, presents the technical requirements and guidance for the accreditation of laboratories that test law enforcement and corrections equipment. The 2021 edition incorporates changes resulting from the release of the 2017 edition of ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*, and NIST Handbook 150. The 2021 edition of NIST Handbook 150-24 supersedes and replaces the 2010 edition.

This handbook was written with the participation of technical experts in the field of law enforcement and corrections equipment testing and is approved by NVLAP. The following main changes have been made to this handbook with respect to the previous edition:

- the program name has been changed from Personal Body Armor to Law Enforcement and Corrections Equipment;

- all references to applicable standards have been updated;

- the numbering has been updated to align with clauses 4 through 8 of ISO/IEC 17025:2017, *General requirements for the competence of testing and calibration laboratories* (hereafter referred to as ISO/IEC 17025)*;*

- requirements redundant to ISO/IEC 17025 have been removed.

This handbook is also available on the NVLAP web site (https://www.nist.gov/nvlap) and also from the NIST Library (https://doi.org/10.6028/NIST.HB.150-24-2021).

Questions or comments concerning this handbook should be submitted to NVLAP, National Institute of Standards and Technology, 100 Bureau Drive, Stop 2140, Gaithersburg, MD, 20899-2140; phone: 301-975-4016; fax: 301-926-2884; e-mail: nvlap@nist.gov.

Introduction

In 2006, the U. S. Department of Justice (DOJ) National Institute of Justice (NIJ) Office of Science and Technology requested the establishment of a NVLAP program to accredit laboratories that test ballistic- and stab-resistant personal body armor to support the voluntary minimum performance standards developed for NIJ by the National Institute of Standards and Technology (NIST) former Office of Law Enforcement Standards (OLES). (OLES has since been subsumed by NIST's Special Programs Office.) NIJ is the research, development, and evaluation agency of the U.S. DOJ and is dedicated to researching crime control and justice issues. NIJ provides objective, independent, evidence-based knowledge and tools to meet the challenges of crime and justice, particularly at the state and local levels. NIJ's principal authorities are derived from the Omnibus Crime Control and Safe Streets Act of 1968, as amended (see 42 USC § 3721-3723), and Title II of the Homeland Security Act of 2002. NIJ develops standards and test methods for law enforcement and corrections equipment, including body armor, and operates the NIJ Compliance Testing Program (CTP). The NIJ CTP exists to ensure that law enforcement and corrections officers have the best information available about the performance and safety of equipment tested by the CTP, and participation by applicants in this program is voluntary.

While NVLAP may accredit any laboratory that meets NVLAP administrative and technical requirements, NIJ has additional requirements. Laboratories performing compliance testing services for NIJ CTP in accordance with NIJ standards, or other standards used by NIJ, must be independent, third-party laboratories which are located and which perform all testing within the United States. Additionally, all laboratories must be free of, and demonstrate their freedom from, any actual or potential conflicts of interest with respect to other services they and/or their parent organizations, subsidiaries, and affiliates may provide, particularly regarding services pertaining to consultation on the design and manufacture of the types of products for which a laboratory will perform NIJ compliance testing services.

Additional information about the NIJ CTP: <https://nij.ojp.gov/topics/articles/nij-standards-and-conformity-assessment-program>.

1 General information

1.1 Scope

1.1.1 NIST Handbook 150-24 specifies the technical requirements and provides guidance for the accreditation of laboratories under the NVLAP Law Enforcement and Corrections Equipment LAP. It supplements the NVLAP procedures and general requirements found in ISO/IEC 17025, by tailoring the general criteria found in NIST Handbook 150 to the specific tests and types of tests covered by the program.

1.1.2 The scope of the Law Enforcement and Corrections Equipment LAP is the set of test methods contained in NIJ standards and other appropriate standards requested by NIJ.

1.1.3 This handbook is intended for information and use by accredited testing laboratories, assessors conducting onsite assessments, laboratories seeking accreditation, other laboratory accreditation systems, users of laboratory services, and others needing information on the requirements for accreditation under the Law Enforcement and Corrections Equipment LAP.

1.1.4 The additional requirements contained in this handbook make the general NVLAP criteria specifically applicable to the Law Enforcement and Corrections Equipment LAP.

1.1.5 ISO/IEC 17025, NIST Handbook 150, this handbook, and test methods indicated on the (proposed) scope of accreditation constitute the collective body of requirements that must be met by a laboratory seeking NVLAP accreditation in the Law Enforcement and Corrections Equipment LAP.

1.1.6 When testing products for consideration by the NIJ Compliance Testing Program (CTP), the laboratory must meet all CTP requirements.

1.2 Organization of handbook

The numbering and titles of clauses four through eight of this handbook correspond to those of ISO/IEC 17025. The primary subclauses in clauses four through eight (e.g., 4.1, 4.2, etc.) are also numbered and titled to correspond with ISO/IEC 17025, even when there are no additional requirements.

1.3 Program description

The NVLAP Law Enforcement and Corrections Equipment LAP provides for laboratory accreditation to ensure that standard test procedures are followed when laboratories conduct testing of law enforcement and corrections equipment, providing a measure of confidence that such laboratories are competent to perform testing to meet the requirements of NIJ. Laboratories that achieve NVLAP accreditation and meet NIJ administrative requirements are eligible to become NIJ-approved laboratories if they are domiciled in the United States. The program accredits laboratories to standards used or developed by NIJ and standards published by ASTM International. The CTP maintains the list of NIJ-approved laboratories that are competent to perform testing to meet the requirements of NIJ. A listing of standards included in the program is available on the NVLAP web site.

1.4 References

The documents required to be available in the laboratory are listed below, as of the time of this publication. Additional documents will be identified in NVLAP Lab Bulletins. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) shall apply within the time limit specified by regulations or other requirements documents.

1.4.1 CTP Administrative Clarification series

1.4.2 CTP Compliance Test Report

1.4.3 Relevant NIJ Laboratory – Application Package

1.4.4 NIJ CTP Product Conformity Assessment System – Autoloading Pistol Scheme

1.4.5 NIST Handbook 150, *NVLAP Procedures and General Requirements*

1.4.6 ISO/IEC 17000:2020, *Conformity assessment - Vocabulary and general principles*

1.4.7 ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

1.4.8 NIST Handbook 150-24, *Law Enforcement and Corrections Equipment*

1.5 Terms and definitions

For the purposes of this handbook, the terms and definitions given in this handbook, NIST Handbook 150, ISO/IEC 17025, ISO/IEC 17000, and relevant NIJ and ASTM standards apply.

1.6 Program documentation

1.6.1 General

Assessors use NVLAP checklists to ensure that each laboratory receives an assessment comparable to that received by others and to assure completeness, uniformity, and objectivity. Checklists assist assessors in documenting the assessment to the NVLAP requirements found in NIST Handbook 150, this handbook, and the ISO/IEC 17025. Checklists contain definitive statements or questions about all aspects of the NVLAP criteria for accreditation, and form part of the Onsite Assessment Report (see NIST Handbook 150). The current version of each checklist is available from NVLAP.

1.6.2 NVLAP General Criteria Checklist

All NVLAP programs use the NVLAP General Criteria Checklist (ISO/IEC 17025:2017) (formerly called the NIST Handbook 150 Checklist), which contains the requirements published in ISO/IEC 17025 and NIST Handbook 150. The checklist items are numbered to correspond to clauses four through eight of ISO/IEC 17025, and annexes A, B, and E of NIST Handbook 150.

1.6.3 NIST Handbook 150-24 Checklist

The NIST Handbook 150-24 Checklist (also referred to as the LECE Program-Specific Checklist) addresses the requirements specific to law enforcement and corrections equipment testing given in NIST Handbook 150-24 (this handbook).

1.6.4 NIST Handbook 150-24x Checklist(s)

NVLAP may develop checklists that mirror checklists developed by the NIJ CTP to document the specific requirements for NIJ-approved ballistic testing laboratories.

1.6.5 Test Method Review Summary

The assessor uses the Test Method Review Summary to review a laboratory's ability to perform law enforcement and corrections equipment test methods. The review of the test methods by the assessor ranges from observing tests to having laboratory staff describe the test procedures. The assessor notes on the Test Method Review Summary the depth into which each part of the test method was reviewed (observed test, walked/talked through test, listened to description of procedures, and examined apparatus).

1.6.6 NVLAP lab bulletins

NVLAP lab bulletins are issued to laboratories and assessors, when needed, to clarify program-specific requirements and to provide information about the most current program additions and changes. Lab bulletins providing additions or changes to the current program will supersede the requirements of the current published handbook until the additions or changes are published in a revision of the handbook. Lab bulletins issued before the revision of this handbook have been incorporated into this document. Lab bulletins pertaining to the program are available on the NVLAP website.

1.6.7 Licenses

NVLAP accreditation does not relieve a laboratory from complying with applicable federal, state, and local laws and regulations. A laboratory must meet federal, state, and local licensing requirements, including import and export, as appropriate.

2 LAP establishment, development, and implementation

There are no requirements additional to that provided in NIST Handbook 150, clause 2.

3 Accreditation process

3.1 General

An overview of the laboratory accreditation process is provided in NIST Handbook 150, clause 3, and includes information pertaining to application, onsite assessment, proficiency testing or similar programs, accreditation decision, granting accreditation, renewal of accreditation, changes to scope of accreditation, monitoring visits, and suspension, denial, revocation, and voluntary termination of accreditation.

3.2 Management system review

3.2.1 Prior to applying to NVLAP for accreditation, a laboratory must have a fully implemented management system.

3.2.2 Prior to the onsite assessment, one or more NVLAP assessors will review laboratory documentation for conformity with NVLAP requirements, including the requirements of this handbook, NIST Handbook 150, and ISO/IEC 17025. During this review, the assessor(s) may request additional management system and/or technical documents and/or records, which will be returned upon request.

3.3 Onsite assessment

3.3.1 The purpose of the onsite assessment is to determine the laboratory's compliance with ISO/IEC 17025, NIST Handbook 150, this handbook, and its own management system, and to assess the capability and competence of the testing activities for which accreditation is being requested.

3.3.2 The onsite assessment will take place at the laboratory site. For a single-site laboratory with redundant testing areas, the assessors will observe testing in one or more of those areas.

3.3.3 Prior to the onsite assessment, the NVLAP assessor(s) provides a preliminary agenda, which may change due to findings observed during the onsite assessment. Efforts will be made to minimize disruption to the normal working routines during the assessment. The assessor(s) will need time and workspace to complete assessment documentation during their time at the laboratory site. At the beginning of the assessment, the laboratory shall make all supporting technical information available in a format that is conducive to a detailed review. This includes the laboratory test procedures, test instructions, and test records.

3.3.4 Laboratory equipment required to perform accredited testing shall be available for assessment and in good working order. This includes environmental and conditioning equipment, testing areas and equipment, and clay management and verification equipment.

a) Although all test methods on the scope or proposed scope of accreditation need not be set up during the onsite assessment, the laboratory shall be prepared to demonstrate selected test methods as requested by the assessor.

b) For those cases where a demonstration is not requested, the laboratory shall be prepared to describe the test method and procedures it would follow and show the actual equipment, fixtures, and arrangements that would be used. The assessment will cover the requirements identified in this handbook, NIST Handbook 150, ISO/IEC 17025, and the laboratory's management system.

3.3.5 Laboratory staff shall be available to answer questions pertaining to the accreditation review. However, the assessor may wish to review documents and records alone, and usually does not ask to remove any laboratory documents or records from the laboratory. If necessary, the assessor will make arrangements to take records for review during the assessment and return them by the end of the assessment.

3.3.6 The NVLAP assessor(s) performs the following activities during a typical onsite assessment:

3.3.6.1 *Opening meeting*: The NVLAP assessor(s) will meet with laboratory management, supervisory personnel, and other appropriate staff members as determined by the laboratory to explain the purpose of

the onsite assessment and to discuss the schedule for assessment activities. Information provided by the laboratory on its application form may be discussed during this meeting.

3.3.6.2 *Staff interviews*: The assessor(s) will ask the laboratory manager to assist in arranging times for individual interviews with laboratory staff members. The assessor(s) will interview staff members filling key positions (e.g., laboratory manager, technical manager, authorized representative, approved signatories) and other staff members who have an effect on the outcome of testing, including staff who conduct testing. The assessor(s) do not need to talk to all staff members; however, the assessor(s) will select staff members representing all aspects of the laboratory. These interviews are conducted to determine whether the staff members are properly trained, assigned, and supervised; technically competent for the tasks assigned to them; and implementing their assigned aspects of the management system in compliance with it.

3.3.6.3 *Records review*: The assessor(s) will review laboratory records, including equipment and maintenance records, laboratory test records and reports, personnel competency records, personnel training plans and records, and safeguards for the protection of sensitive and proprietary information. The assessor will also review:

a) records of internal audits, records of quality control activities, and participation in proficiency testing or other similar programs;

b) personnel records, including résumés and job descriptions of key personnel, and competency evaluations for all staff members who routinely perform the test method for which accreditation is sought;

c) calibration records and certificates (see 6.4);

d) records of evaluations, verifications, and testing of purchased services, equipment, etc.

3.3.6.4 *Internal audit and management review*: The assessor(s) will review and discuss with the laboratory staff the laboratory's internal audit and management review activities, which are separate and distinct activities. The discussion will include all aspects of those activities including management system procedures, audit findings, cause determination, actions taken to resolve those findings, actions taken to prevent recurrence, and results of the management review.

3.3.6.5 *Equipment and software*: The assessor(s) will examine and determine the suitability of all equipment and facilities required to perform the standard test methods for which the laboratory is accredited (or is seeking accreditation). The appropriate environmental conditions required for testing will be assessed. The assessor will observe the demonstration of selected procedures by appropriate personnel assigned to conduct the tests and will interview those personnel. The assessor will review test data, examine hardware and software for function and appropriateness, and review software validation and verification procedures and records.

3.3.6.6 *Demonstrations*: Demonstrations requested may be selective or all-inclusive. Based on the scope of accreditation, the assessor(s) will observe demonstrations of selected testing procedures conducted by technical personnel assigned to conduct the tests and will discuss the tests to assure that the staff understands the procedure. The assessor(s) may also select and trace the history of one or more test items from receipt to final issuance of a test report. These demonstrations are for the purpose of assessing laboratory competence, not the properties of any specific product. This includes conditioning, clay verification, test threat development, ballistics testing, stab resistance testing, and firearms testing. Assessor(s) will observe demonstration by technical personnel assigned to conduct testing and will discuss testing with technical personnel to assure their understanding of procedures. The assessor(s) will use the Test Method Review

Summary (see 1.6.5), the NIST Handbook 150-24 Checklist (see 1.6.3), and 150-24x (see 1.6.4) checklist(s) in reviewing and summarizing the laboratory's ability to conduct the test methods.

3.3.6.7 *Quality control*: The assessor(s) will discuss all aspects of quality control results (see section 7.7) with appropriate staff. Test methodology and records documenting the laboratory's execution of testing will be reviewed and discussed, including any unusual trends or outlying results. The assessor(s) may provide materials and artifacts to the laboratory for testing during the onsite assessment. Prior to the visit the assessor(s) will ensure that facilities are available. This may include the conduct of entire tests or select portions of tests.

3.3.6.8 *Proficiency testing*: The assessor(s) will discuss all aspects of proficiency testing (PT) results with appropriate staff. Test methodology and records documenting the execution of PT will be reviewed and discussed. Trends, outlying test results, and anomalies will also be discussed.

3.3.6.9 *Onsite assessment report*: The assessor(s) will complete an onsite assessment report, which contains the NVLAP Onsite Assessment Signature Sheet with Narrative Summary, NVLAP General Criteria Checklist (ISO/IEC 17025:2017), NIST Handbook 150-24 Checklist, 150-24x checklist(s), and the Test Method Review Summary. The assessor(s) will also enter any nonconformities and/or comments into the NVLAP interactive website (NIWS). All observations made by the assessor will be held in confidence as stated in the declaration signed by all assessors and NVLAP staff.

3.3.6.10 *Closing meeting*: The assessor(s) will conduct a closing meeting with the laboratory manager, supervisory personnel, and other appropriate staff members to discuss the findings. During the visit the assessor(s) will have identified all nonconformities and comments. These will be discussed at the closing meeting. The assessor(s) will specifically note items that have been corrected during the onsite assessment. The process for resolving nonconformities identified during the onsite assessment is documented in Section 3.3.4 in NIST Handbook 150. Disagreements between the laboratory and the assessor may be referred to NVLAP for resolution.

3.3.7 The laboratory should review all comments for potential improvements in testing.

3.4 Proficiency testing

3.4.1 NIST Handbook 150 defines PT and describes how it is included in the accreditation process. Special PT rounds may be scheduled separately for specific needs.

3.4.2 When PT programs are available, and when instructed by NVLAP, laboratories shall participate in PT for identified test methods and portions of test methods.

3.4.3 PT is used to evaluate the competence of the laboratory. It is not meant to be used to evaluate the products included in the CTP. Laboratories renewing accreditation shall have satisfactorily participated in all required PT during the previous accreditation period.

3.4.4 PT may consist of several parts in order to assure the proper evaluation of a laboratory. The PT concept is designed to allow the evaluation of the laboratory's ability to produce repeatable and reproducible test data. Portions of the testing process may be "highlighted" in PT, e.g., equipment, software, test techniques, data logging, data analysis, test report generation, etc. Laboratories will be informed, in advance, of specific PT activities, and testing shall be conducted according to instructions provided by the PT provider.

3.4.5 PT may include testing of vests and packs, measurement of artifacts to include weight and length, and examination of prepared artifacts. In some cases, the laboratory will be asked to include color photographs in the test report. For conditioning requirements in the standard, PT may include measurement of temperature, relative humidity, and other parameters for a complete cycle as specified in the standard, e.g., one day, ten days, etc. For stab resistance, PT may include testing of provided stab packs and instrumentation of the stab test equipment.

3.4.6 The results of PT will be reported to the participants in appropriate documents and reports. Problems indicated by PT shall be discussed by NVLAP with the appropriate laboratory personnel responsible for developing and implementing plans for resolving the problems. The results of PT are also made available to NVLAP assessors for discussion during laboratory onsite assessment visits.

3.4.7 Generally, it is required that the specific PT procedures be conducted in accordance with the applicable standard test method. The PT artifacts or test items shall, like all test items received by the laboratory, be listed or entered into the normal tracking and identification system for control and data recording. At times, however, the provider may specify special conditions to assure uniformity in procedures and test conditions among participants. These may include the number of replicate measurements, test item preparation, and other test parameters. Also, PT may consist of several parts in order that the operation of the laboratory may be evaluated. Portions of the standard test procedure may be emphasized, such as measurement, instrumentation, equipment, data analysis, and reporting. PT shall not be contracted to another laboratory.

3.4.8 When appropriate, PT data are analyzed using statistical procedures to determine distributions and statistical parameters, such as averages, standard deviations, and outliers. Using the test data from PT, the laboratory shall monitor its own testing performance. Procedures for receiving, analyzing, and monitoring the laboratory's test results shall be documented in its management system documentation.

3.4.9 Unsatisfactory performance in PT (e.g., outlying test results and incomplete test reports) is a technical nonconformity that shall be resolved by the laboratory to maintain its accreditation for the test method(s) in question. After notification of unsatisfactory performance, the laboratory shall take corrective action to investigate and resolve nonconformities in a timely manner, according to the requirements of NIST Handbook 150. Unsatisfactory performance in PT may result in suspension or revocation of accreditation for those test methods in question.

3.4.10 In no case shall PT artifacts be considered as calibration standards or standard reference materials or be used as substitutes for calibration standards that are traceable to NIST or other national metrology institutes (NMIs).

4 General requirements

4.1 Impartiality

There are no requirements additional to those set forth in ISO/IEC 17025.

4.2 Confidentiality

There are no requirements additional to those set forth in ISO/IEC 17025.

5 Structural requirements

A laboratory seeking NIJ-Approved Laboratory designation shall meet the additional organizational requirements for independence, domicile, etc., as specified by NIJ.

6 Resource requirements

6.1 General

There are no requirements additional to those set forth in ISO/IEC 17025.

6.2 Personnel

6.2.1 Personnel records

Key NVLAP accreditation personnel -The laboratory shall maintain a record of personnel designated to fulfill NVLAP requirements including laboratory manager, technical manager, NVLAP-authorized representative, NVLAP-approved signatories, and staff responsible for conducting testing.

6.2.2 Specific experience and competence of technical manager

The laboratory's technical manager shall have a combination of knowledge, experience, and training in testing law enforcement and corrections equipment defined on the (proposed) scope of accreditation and shall have the technical competence and supervisory capability to direct the work of professionals and technicians in testing law enforcement and corrections equipment.

6.2.3 Competency reviews

6.2.3.1 The laboratory shall develop an appropriate list of staff member competencies for each test method. Competencies include various techniques for specific NIJ and ASTM test methods.

6.2.3.2 For each staff member, the staff member's immediate supervisor, or designee, shall conduct an annual assessment of performance competence.

6.2.3.3 These annual performance competency reviews shall be documented, dated, signed by the supervisor and employee, retained in the personnel files, and be available for review by the assessor(s). For the purpose of onsite assessments, a separate personnel folder of information specific to applicable NVLAP requirements may be provided instead of the complete folder, which may contain confidential information not needed for the assessment.

6.3 Facilities and environmental conditions

There are no requirements additional to those set forth in ISO/IEC 17025.

6.4 Equipment

Proper performance and calibration of measurement equipment, test equipment, and reference standards shall be periodically verified as needed using cross-checks and/or working standards. The periodical verification shall be recorded.

6.5 Metrological traceability

There are no requirements additional to those set forth in ISO/IEC 17025.

6.6 Externally provided products and services

6.6.1 An NIJ-approved laboratory may subcontract the conditioning of armor. Ballistics tests and stab tests shall not be subcontracted.

6.6.2 The NIJ-approved laboratory is responsible for the work of, and reports from, subcontracted laboratories. The requirements of section 7.1 shall be met.

6.6.3 All aspects of subcontracting shall be documented in the laboratory management system, including procedures and instructions for handling and shipping.

7 Process requirements

7.1 Review of requests, tenders and contracts

Contracts for tests that are to be submitted to the CTP shall meet the requirements of the CTP in addition to all technical and NVLAP requirements.

7.2 Selection, verification, and validation of methods

7.2.1 When a technical standard contains normative references, the laboratory shall have the reference documents readily available where necessary for proper implementation of the standard.

7.2.2 The laboratory shall have procedures for modifying all relevant management system documents when new versions of standards or clarifications are published, as appropriate.

7.2.3 The laboratory shall review NIJ CTP Administrative Clarifications before beginning a test series and shall implement clarifications, as appropriate.

7.2.4 The laboratory may include old and new versions of standards in its management system when multiple versions are included in its scope of accreditation or when required by customers or the NIJ CTP.

7.3 Sampling

7.3.1 All requirements of ISO/IEC 17025 for sampling apply to subsampling. When a laboratory tests some subset of the test items supplied by the customer, it is subsampling.

NOTE ISO/IEC 17000:2020 defines sampling as "selection and or collection of material or data regarding an object of conformity assessment."

NOTE 1 to entry [from ISO/IEC 17000:2020]: selection may be on the basis of a procedure, an automated system, professional judgement etc.

NOTE 2 to entry [from ISO/IEC 17000:2020]: selection and collection may be performed by the same or different persons or organizations.

7.3.2 When the NIJ standard or a customer contract requires that some, but not all, of the armor samples or items being tested are to be treated differently from the rest of the items, this shall be considered sampling. The laboratory shall have procedures and instructions for selecting the items from the group that are to be tested per the NIJ standard or the customer contract.

7.4 Handling of Test or Calibration Items

7.4.1 The laboratory shall inspect incoming samples and materials and the accompanying documentation. This inspection shall be conducted before any testing begins. The laboratory shall ensure that it has received all required materials and documentation.

7.4.2 The laboratory shall have procedures for collecting test items or for verifying that provided samples meet its requirements.

7.4.3 The laboratory shall record in its own records, and in test reports, the organization that selected the items for testing.

7.4.4 When a customer sends test items for special or non-standard testing, the laboratory shall meet the customer requirements.

7.5 Technical records

7.5.1 The laboratory shall have a system for data capture that ensures error-free logging, transcription to the compliance test report (CTR) and recording of all relevant data and parameters for environmental conditions, test item conditioning, ballistics testing, stab resistance testing, and firearms testing.

Where applicable, this shall include two-person verification of readings and recordings. Spoken readings, (e.g., backface deformation (BFD) measurements) made on the range shall be verified after the readings have been entered in the CTR.

7.5.2 Handwriting shall be unambiguously legible. Analog charts shall be fully labeled. Data shall be taken and recorded with adequate resolution. Where appropriate, photographs may be used to document observations.

7.5.3 When the results of a critical measurement are not durable, (e.g., the digital display of time or velocity on the chronometer), the laboratory shall have a procedure that ensures the error-free transcription of the information from the instrument to the permanent record.

7.5.4 When required for critical measurements (e.g., ballistic-resistant body armor BFD measurements greater than 40 mm), the laboratory shall ensure that two independent measurements are made and recorded.

7.5.5 Requirements for roundoff and truncation of the data, as specified in relevant standards, shall be followed.

7.5.6 Explanations for nonconformities and anomalies that appear on the tables and plots shall be recorded and kept in the test records.

7.5.7 Expected anomalies shall be explained with generic notes, (e.g., the transient in relative humidity when the temperature is changed or the recorded relative humidity data that has no meaning at certain temperatures in the 24-hour cycle).

7.6 Evaluation of measurement uncertainty

7.6.1 The management system documentation shall list the important components that substantially affect the measurement uncertainty of the test results for each test method on the (proposed) scope of accreditation. This can be done for groups of similar test methods rather than for each test method.

7.6.2 Further, an estimate of the magnitude of identified uncertainty contributions shall be provided.

7.6.3 The uncertainty shall be determined and reported if required by the test method, the regulator (CTP), or the customer.

NOTE The uncertainty contribution of the important components only need be approximated. At this time, documentation validating the uncertainty contribution is not required.

7.7 Ensuring the validity of results

There are no requirements additional to those set forth in ISO/IEC 17025.

7.8 Reporting of results

7.8.1 General

7.8.1.1 CTRs submitted to the CTP for testing shall meet the requirements of the standard, the CTP, and NVLAP.

7.8.1.2 Test reports submitted to the CTP for testing to NIJ standards shall meet the requirements of the standard, the CTP, and NVLAP.

7.8.2 Common requirements for reports (test, calibration, or sampling)

7.8.2.1 Test reports shall clearly reference the test method and edition, including the year published, used for testing.

7.8.2.2 The laboratory personnel responsible for report writing and generation shall be available to be interviewed by the assessor(s) during the laboratory's onsite assessment.

7.9 Complaints

7.9.1 When a CTR is returned to the laboratory for correction, the laboratory shall treat this as a complaint.

7.9.2 Requests from the CTP for additional information concerning test items, tests, and test results shall be considered as potential complaints.

7.10 Nonconforming work

7.10.1 The laboratory shall follow its documented procedures if it discovers that it has issued a test report that contains errors, including errors in testing, analysis, or reporting.

7.10.2 The laboratory shall inform the customer and offer remediation.

7.10.3 The laboratory shall fulfill any additional NIJ requirements for control of nonconforming testing.

7.10.4 A NVLAP-accredited laboratory that acts as a subcontracted laboratory shall inform the subcontracting laboratory and the CTP if nonconforming work is detected.

7.11 Control of data and information management

There are no requirements additional to those set forth in ISO/IEC 17025.

8 Management system requirements

8.1 Options

There are no requirements additional to those set forth in ISO/IEC 17025.

8.2 Management system documentation

There are no requirements additional to those set forth in ISO/IEC 17025.

8.3 Control of management system documents

There are no requirements additional to those set forth in ISO/IEC 17025.

8.4 Control of records

Records shall be kept for a period of at least three years unless a longer period is required by the customer, regulation, or the laboratory's own procedures.

8.5 Actions to address risks and opportunities

There are no requirements additional to those set forth in ISO/IEC 17025.

8.6 Improvement

There are no requirements additional to those set forth in ISO/IEC 17025.

8.7 Corrective actions

There are no requirements additional to those set forth in ISO/IEC 17025.

8.8 Internal audits

8.8.1 The internal audit shall cover compliance with NVLAP, the laboratory's management system, contractual agreements, and test method requirements. They shall be completed at an interval no greater than 18 months. A NVLAP onsite assessment is not an internal audit.

8.8.2 An applicant laboratory shall conduct at least one complete internal audit, including the test methods of the laboratory's proposed scope of accreditation, prior to the first onsite assessment. The internal audit report and pertinent records will be reviewed by the NVLAP assessor(s) during the onsite assessment.

8.9 Management reviews

8.9.1 Periodic reviews of the management system shall reflect adherence to NVLAP requirements and the laboratory's quality objectives and shall be completed, at a minimum, on an annual basis.

8.9.2 An applicant laboratory shall perform at least one complete management review prior to the first onsite assessment. The management review report(s) and pertinent records will be reviewed by the NVLAP assessor(s) before or during the onsite assessment.

8.9.3 For accredited laboratories, reports and pertinent records for management reviews conducted since the previous onsite assessment shall be made available for review during the onsite assessment.