DATE: | | NVLAP LAB CODE: | |

# NIST HANDBOOK 150-16 CHECKLIST
# COMMERCIAL PRODUCTS TESTING PROGRAM

**Instructions to the Assessor:** This checklist addresses specific accreditation requirements prescribed in NIST Handbook 150-16, Commercial Products Testing. The Test Method Review Summary, which is used to review the laboratory's ability to perform Commercial Products Testing test methods, is to be used in conjunction with this checklist.

Place an "X" beside any of the following items that represent a nonconformity. Place a "C" beside each item on which you are commenting for other reasons. Record the item number and your nonconformity explanation and/or comments on the appropriate comment sheet(s). Place a check beside all other items you observed or verified at the laboratory.

**Note:** The numbering of the checklist items correlates to the numbering scheme in NIST Handbook 150-16, clauses 3, 4, and 5.

## 3 Accreditation process

### 3.2 Management system review

____ 3.2.1 Management system shall be fully implemented.

____ 3.2.2 If management system documentation is not organized the same as NIST Handbook 150, a cross-reference document shall be provided.

____ 3.2.3 If management system documentation is not organized the same as NIST Handbook 150, the cross-reference document shall verify that all requirements of NIST Handbook 150-16 and clauses 4 and 5, as well as annexes A through B, of NIST Handbook 150 are addressed and their locations identified in the management system documentation.

### 3.3 On-site assessment

____ 3.3.3 All laboratory equipment required to perform accredited testing shall be available for assessment and in good working order. The laboratory shall be prepared to demonstrate selected test methods as requested by the assessor.

____ 3.3.4 The laboratory shall make available all supporting technical information in a format that is conducive to a detailed review.

____ 3.3.6 The laboratory shall resolve or formulate a plan to resolve all nonconformities and provide a response to NVLAP within 30 days from the date of the on-site assessment.

____ 3.3.7 The laboratory shall review all comments for potential improvements in commercial products testing.

### 3.4 Proficiency testing

____ 3.4.1.1 Laboratories applying for initial accreditation shall participate satisfactorily in proficiency testing, provided the proficiency testing is offered during the application period. Laboratories renewing accreditation shall have satisfactorily participated in all required proficiency testing during their previous accreditation period.

____ 3.4.1.2 After notification of unsatisfactory proficiency testing performance, the laboratory shall take corrective action to investigate and resolve nonconformities in a timely manner, according to the requirements of NIST Handbook 150 for the control of nonconforming work.

____ 3.4.1.3 The laboratory shall make available to NVLAP the results of proficiency testing for use during the laboratory's on-site assessment. The assessor will discuss any problems indicated by proficiency testing with appropriate laboratory personnel responsible for developing and implementing plans for resolving the problems.

3.4.2.1

____ a) Laboratories seeking accreditation in the fields of paper and plastics shall enroll and maintain participation in proficiency testing programs provided by Collaborative Testing Services (CTS), Sterling, VA. The laboratories shall participate in all test methods for which they are seeking accreditation and which CTS offers as part of its testing service.

____ b) After each CTS proficiency testing round, the laboratory shall submit their identified CTS results to NVLAP for review.

____ c) The proficiency test samples, like all others received by the laboratory, shall be listed or entered into the normal sample tracking and identification system for control and data recording.

____ d) The proficiency testing shall not be contracted out to another laboratory.

____ e) Using the test data from proficiency testing, the laboratory shall monitor its own testing performance. Procedures for receiving, analyzing, and monitoring the laboratory's test results shall be documented in its quality manual.

## 4 Management requirements for accreditation

### 4.2 Management system

____ 4.2.1 If the laboratory uses a computer-based documentation system, the laboratory should consider ease of usability by the staff. The laboratory shall ensure that the requirements of NIST Handbook 150 are met so that staff are knowledgeable of the online documentation system and can, if authorized, readily retrieve needed information.

____ 4.2.2 The laboratory shall have readily available the latest published version of all of the test methods for which accreditation has been requested.

____ 4.2.3 If a customer, for whatever reason (e.g., regulatory requirement), requires accreditation to previous versions of a test method, then the laboratory shall document that requirement and shall have readily available the required version of the test method.

____ 4.2.4 When a test method references another test method, guide, practice, or specification, the laboratory shall have readily available the referenced documents, where relevant.

4.2.5 In addition to the information specified in NIST Handbook 150, the quality manual and/or supporting management system documentation shall include:

____ a) testing facilities and scope of services offered;

____ b) policy and procedures for use of subcontractors, if applicable;

____ c) procedures and actions concerning damaged or altered test materials and specimens;

____ d) the range (e.g., size, shape, density, and property level) of test specimens that a laboratory can test for each test method;

____ e) procedures for maintenance and calibration of the equipment used in conducting the tests in the CPT Program (see 5.6.2);

____ f) procedures for receiving, analyzing, and monitoring the laboratory's proficiency test results.

____ 4.2.6 The laboratory shall create a cross-reference document allowing the laboratory and a NVLAP assessor to verify that all requirements of clauses 4 and 5 and annexes A and B of NIST Handbook 150 and the corresponding requirements of NIST Handbook 150-16 are addressed in the management system documentation.

**4.6 Purchasing services and supplies**

____ 4.6.1 The laboratory shall evaluate vendors and verify or test incoming equipment, materials, and supplies that affect the quality and accuracy of the test results.

**4.13 Control of records**

____ 4.13.1 All records (test/calibration/verification, etc.; hardcopy and electronic) shall include the identity of the personnel responsible for the sampling, preparation, calibration, testing, and checking of results, and where appropriate, the associated date.

4.13.2

____ a) Records for each test, including calibration of test equipment, shall contain sufficient information to permit the same or another laboratory to reproduce the test plan in a manner that would make it possible to obtain comparable test results.

____ b) These records shall be kept for a period of at least three years following the issuance of a test report, unless a longer period is required by the customer, regulation, or the laboratory's own procedures.

### 4.14 Internal audits

____ 4.14.1 The internal audit shall cover compliance with NVLAP, laboratory management system, regulatory, contractual, and testing requirements.

____ 4.14.2 An applicant laboratory shall conduct at least one complete internal audit prior to the first on-site assessment.

____ 4.14.3 For accredited laboratories, internal audit reports conducted since the previous on-site assessment shall be made available for review.

### 4.15 Management reviews

____ 4.15.1 Periodic reviews of the management system shall reflect adherence to NVLAP requirements and the laboratory's quality objectives.

____ 4.15.2 Management reviews shall review all nonconformities and may reflect positive aspects of the management system.

____ 4.15.3 An applicant laboratory shall perform at least one complete management review prior to the first on-site assessment.

____ 4.15.4 The report of the management review shall be available during the NVLAP on-site assessment.

## 5 Technical requirements for accreditation

### 5.2 Personnel

____ 5.2.1 The laboratory shall maintain a list of personnel designated to fulfill NVLAP requirements including: Laboratory Director, Technical Director, Team Leaders, NVLAP Authorized Representative, NVLAP Approved Signatories, and the staff responsible for conducting the testing.

____ 5.2.2 The laboratory's Technical Director (or an appropriate supervisor) shall be experienced in commercial products testing and shall have the technical competence and the supervisory capability to direct the work of professionals and technicians in commercial products testing.

____ 5.2.3 When key personnel (see 3.3.5 b) of NIST Handbook 150-16) are added to or removed from the staff, the notification to NVLAP of the personnel changes shall include a current résumé for each new staff member.

5.2.4

____ a) Laboratories shall document the required qualifications for each staff position, including a résumé of qualifications; laboratory testing procedures to which the person is assigned and authorized to perform; and the results of periodic testing performance reviews.

____ b) The laboratory shall evaluate the competency of each staff member for each test method the staff member is authorized to conduct.

Personnel competency for the Commercial Products Testing program includes applicable portions of the following, as a minimum:

____ i) general requirements of the test methods;

____ ii) specimen preparation, dimensional measurements, mounting techniques;

____ iii) operation, maintenance, and calibration of environmental control apparatus, including humidity cabinets, cold boxes, and any environmentally-controlled laboratory workspaces;

____ iv) procedures for environmental conditioning of specimens;

____ v) operation and calibration of test machines;

____ vi) determination of moisture content, specific gravity, or density;

____ vii) calibration requirements and operation of load/deformation/strain-recording equipment;

____ viii) operation and calibration of drying ovens and furnaces;

____ ix) description of specimen and test setup;

____ x) operation and calibration of balances and scales for mass determination;

____ xi) use and calibration of dimensional measuring devices (calipers, micrometers, etc.);

____ xii) operation of automatic data logging and readout instrumentation;

____ xiii) operation and calibration of ammeters, ohmmeters, voltmeters, wattmeters, and potentiometers.

____ c) For each staff member, the staff member's immediate supervisor, or a designee appointed by the Laboratory Director, shall conduct annually an assessment and an observation of performance. These annual performance reviews shall be documented, dated, signed by the supervisor and the employee, retained in the personnel file and be available for review by the assessor.

____ 5.2.5 The laboratory shall have a description of its training program for ensuring that staff is able to perform tests properly. The training program shall be updated and current staff members shall be given additional training when test methods are updated or procedures change, or when the individuals are assigned new responsibilities. Each staff member may receive training for assigned duties either through on-the-job training, formal classroom study, attendance at conferences, or another appropriate mechanism. The laboratory shall ensure that each new staff member is trained for the testing duties assigned.

____ 5.2.6 Training materials that are maintained within the laboratory shall be kept up-to-date, including applicable versions of standard test methods, as well as appropriate reference documents, texts, and scientific and industry periodicals. These materials shall be readily available to the laboratory staff.

____ 5.2.7 The laboratory shall ensure all individuals performing testing activities satisfy all NVLAP requirements, irrespective of the means by which individuals are compensated (e.g., the laboratory must ensure all test personnel receive proper training and supervision and are subject to annual performance reviews, etc.).

**5.3 Accommodation and environmental conditions**

____ The laboratory workspace and environmentally controlled spaces (e.g., constant temperature-relative humidity rooms or cabinets) shall be checked for the required conditions. Monitoring and control devices shall be calibrated and functioning properly so as to maintain and record the required environmental conditions.

## 5.4 Test and calibration methods and method validation

### 5.4.1 Standard test methods

____ 5.4.1.1 The management system documentation shall contain or make reference to detailed written instructions of the procedures, practices, instructions and equipment that the laboratory uses in conducting the test methods for which it seeks or holds accreditation. These detailed instructions, including those for equipment operation, calibration checks, and quality control checks, shall address any laboratory-specific information not contained in the standard method. When necessary, the test method shall be supplemented with additional detailed instructions beyond the test method to ensure consistent application.

____ 5.4.1.2 A laboratory may be accredited to perform standard test methods in their entirety or to perform only specific sections in the test method. Accreditation restrictions to specific sections of the test method shall be stated on the laboratory's scope of accreditation.

### 5.4.2 Off-site testing

____ 5.4.2.2 The laboratory shall provide a step-by-step procedure for personnel to follow when performing off-site testing.

____ 5.4.2.3 The laboratory shall maintain records of its off-site testing.

5.4.2.4 If a laboratory selects off-site testing methods to be included in its scope of accreditation, it shall provide to the NVLAP assessor the following:

____ a) complete step-by-step procedure for personnel to follow when performing the standard off-site test;

____ b) demonstration of the test procedure;

____ c) folder or file containing raw data from off-site tests;

____ d) test reports and test data sheets;

____ e) demonstration of compliance with NVLAP calibration and traceability requirements;

____ f) evidence that adequate supervision during the off-site testing is provided by a qualified staff member of the accredited laboratory.

### 5.4.3 Additional requirements

The following requirements relate to test methods and the conduct of tests, including mechanical, physical, and chemical properties:

____ a) Samples are properly prepared, environmentally conditioned (including proper moisture content), handled, and maintained before testing.

____ b) Measurements of specimen dimensions and mass are determined correctly; descriptions of important sample characteristics are recorded when required.

____ c) Test(s) are conducted within the specified environmental conditions, including temperature and relative humidity.

____ d) Specimens and products are tested in the specified orientation, if any, and with proper test setup.

____ e) For mechanical testing, the proper rate of load, strain, or deformation is applied to specimen.

**5.4.4 Estimation of uncertainty of measurement**

____ At a minimum, the management system documentation shall list the important variables that substantially affect the uncertainty of the test results. This can be done for groups of similar test methods (e.g., grouped by mechanical, physical, or electrical properties) rather than for each test method. The uncertainty shall be determined and reported if required by the test method or the customer.

**5.6 Measurement traceability**

____ 5.6.2 To account for the effects on traceability of the calibration of measurement and test equipment (M & TE), the laboratory shall determine calibration, verification, and maintenance intervals based on the equipment's frequency of use and the environment in which it is used, and also in accordance with standard test methods, manufacturer's recommendations, or as specified in the following table, whichever results in shorter time periods between calibrations. Extension of the time interval between calibrations is acceptable if the laboratory can provide justification for increasing the interval.

| ***Apparatus/Instrumentation*** | ***Calibration or Verification Frequency*** |
|---|---|
| dimensional measuring devices (calipers, micrometers, etc.) | annually |
| drying ovens | annually |
| furnaces | annually |
| tensile/compression test machines and load cells | annually |
| scales and balances | annually |
| automatic data logging and readout* | annually |

| *Apparatus/Instrumentation* | *Calibration or Verification Frequency* |
|---|---|
| temperature sensors and related instrumentation* | annually* |
| thermostats* | annually |
| potentiometers* | annually |
| ammeters, ohmmeters, voltmeters and wattmeters* | annually |
| environmental conditioning units | quarterly |
| humidity cabinets | quarterly |
| cold boxes | quarterly |

* If the calibration of the equipment is shown to vary due to the lack of modern solid-state electronics, then the entry under *Frequency* shall be 6 months.

____ 5.6.3 Proper performance of the testing equipment shall be periodically verified as needed.

____ 5.6.4 The reference standards used and the environmental conditions at the time of calibration shall be documented for all calibrations.

5.6.5

____ a) Certificates are required for calibrations performed by outside services. A calibration certificate shall indicate uncertainty or accuracy tolerance limits, and traceability of reference standards.

____ b) If the testing laboratory performs its own calibration, the standard metrological procedures used, the environmental conditions, and the measurement uncertainty shall be documented. For such calibrations, the testing laboratory shall have properly trained personnel who understand the importance of the various factors that affect the uncertainty of the calibration and its effect on the uncertainty of the final test result (see NIST Handbook 150, 5.4.6).

5.6.6 In addition to the information specified in NIST Handbook 150, 5.5.5, calibration or verification records shall include the following:

____ a) a list of all equipment variables requiring calibration, traceability, or verification;

____ b) range of calibration/traceability/verification;

____ c) resolution (precision or the number of digits read) of the instrument and its allowable error (i.e., tolerance);

____ d) periodic verification dates and schedule;

____ e) identity of the laboratory individual/group or external service responsible for calibration;

____ f) identity and source of reference standard and traceability.

**5.7 Sampling**

____ Appropriate sampling plans shall be included in the management system when they are required by the test method or when the laboratory is required to sample.

**5.10 Reporting the results**

____ Where appropriate, test reports shall clearly state that the test results apply to the product or system as tested and, if required, conform to regulator requirements.

# COMMENTS AND NONCONFORMITIES

**Instructions to the Assessor:** Use this sheet to document comments and nonconformities. For each, identify the appropriate item number from the checklist. Identify comments with a "C" and nonconformities with an "X." If additional space is needed, make copies of this page (or use additional blank sheets).

| Item No. | Comments and/or Nonconformities |
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