National Voluntary
Laboratory Accreditation
Program

U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards

NVLAP

Commercial Products LAP Handbook

OPERATIONAL AND TECHNICAL REQUIREMENTS
OF THE
LABORATORY ACCREDITATION PROGRAM
FOR
COMMERCIAL PRODUCTS

NBSIR 85-3171

U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards
Office of Product Standards Policy
Gaithersburg, Maryland 20899

May 1985

COMMERCIAL PRODUCTS LAP HANDBOOK
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U.S. DEPARTMENT OF COMMERCE
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U.S. DEPARTMENT OF COMMERCE, Malcolm Baldrige, *Secretary*
NATIONAL BUREAU OF STANDARDS, Ernest Ambler, *Director*

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I. THE COMMERCIAL PRODUCTS LAP AT A GLANCE

This document presents the operational and technical requirements of the Laboratory Accreditation Program (LAP) for Commercial Products, including paint and related coatings and materials, paper and related products, and mattresses. All of the steps leading to accreditation are described. Explanation of technical requirements indicate how the NVLAP criteria are applied.

The laboratory accreditation program for commercial products was established in 1984 in response to a request from the International Coalition for Procurement Standards (ICPS). The purpose of the LAP is to enable accreditation of laboratories so that purchasing authorities may meaningfully specify in their contracts that materials be tested by laboratories accredited under NVLAP.

Accreditation is available to any organization, including commercial laboratories; a manufacturer's laboratories; and Federal, state, or local government laboratories that test paint, paper, or mattresses using the test methods listed in the Appendix.

Products covered: Paint and related coatings and materials, paper and related products, and mattresses.

Period of accreditation: One year

On-site assessment frequency: After initial application and every two years thereafter

Proficiency testing:

Paint: Participation in the Paint Proficiency Testing Program conducted by Collaborative Testing Services, Inc. (CTS) and the Federation of Societies for Coating Technology.

Paper: Participation in the Paper Proficiency Testing Program conducted by CTS and the Technical Association of the Pulp and Paper Industry (TAPPI).

Mattresses: Proficiency testing program to be developed.

Proficiency testing frequency: In accordance with the CTS programs described above.

Fees: Administrative fee, one-time initial fee, and total test method fee based on the number of test methods selected. Proficiency testing fee paid directly to CTS.

II. INTRODUCTION

Background

The U.S. Department of Commerce, National Bureau of Standards (NBS) administers the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP's function is to accredit public and private testing laboratories based on evaluation of their technical qualifications and competence for conducting specific test methods in specified fields of testing. Accreditation is granted on the basis of conformance with criteria published in the Code of Federal Regulations as part of the NVLAP procedures (15 CFR Part 7). (See Appendix.)

This document is intended for use by staff of accredited laboratories, those seeking accreditation, other laboratory accreditation systems, and others needing information on the requirements for NVLAP accreditation under this LAP. This document is generally included in the **NVLAP Application Package** along with **General Application Forms, Test Method Selection Lists,** and other materials needed to apply for or renew accreditation. It presents the administrative and operational procedures and technical requirements of the LAP and should be retained and be readily accessible to laboratory personnel.

NVLAP Accreditation

Accreditation is granted only after thorough evaluation of the applicant has demonstrated that all NVLAP criteria have been met. The accreditation is formalized through issuance of a Certificate of Accreditation, Scope of Accreditation and publicized by announcement in various government and private media.

NVLAP accreditation is available to commercial laboratories, manufacturer's in-house laboratories, university laboratories, Federal, State, and local government laboratories. Foreign- based laboratories may also be accredited by NBS if they meet the same requirements as domestic laboratories and pay any additional fees required.

Why NVLAP Accreditation ?

The reasons why a laboratory may wish to be accredited include: legal requirements such as regulations or codes, contract specifications, and the desire to be recognized as being demonstrably competent to meet the needs of its clients.

For accreditation to be meaningful, it must be granted by a clearly credible organization. NVLAP provides an unbiased third party evaluation and recognition of performance as well as expert technical assistance to upgrade laboratory performance.

Testing Laboratory Defined

NVLAP defines a "testing laboratory" as an organization that provides services to measure, examine, test, calibrate, or otherwise determine the characteristics or performance of products or systems.

Accreditation Defined

NVLAP accreditation means recognition of a testing laboratory's competence to perform specific test methods in specified fields of testing. It means that the laboratory's quality system, staff, facilities and equipment, calibration procedures, test methods and procedures, records, and test reports, have been evaluated and found to meet NVLAP criteria. NVLAP accreditation does not mean a guarantee (certification) of laboratory performance or product test data; it is a finding of laboratory competence.

For further information about NVLAP, or assistance in understanding and meeting the NVLAP requirements and criteria, please write or call:

NVLAP
National Bureau of Standards
ADMIN A531
Gaithersburg, MD 20899

Phone: 301- 975-4016

III. ADMINISTRATIVE AND OPERATIONAL REQUIREMENTS

Note: Administrative and operational requirements presented here are generally applicable to all NVLAP programs. Technical and proficiency requirements are specifically applicable to this LAP.

LABORATORY CODE NUMBER

Each participating laboratory is assigned a four-digit laboratory code number. The code number is used by the NVLAP staff for identification, filing, recordkeeping, and database management. Participants are requested to put their Lab Code number on all correspondence with NVLAP.

ACCREDITATION PERIOD

Accreditation is granted for a period specified in the LAP Application Package (usually one year). The accreditation period begins on one of four dates: January 1, April 1, July 1, or October 1. Once a laboratory has been assigned an accreditation date, it retains that date as long as it remains in the program. Accreditation expires and is renewed on that date.

RENEWAL

Each participating laboratory will be sent a renewal Application Package, well in advance of the expiration date of its accreditation, to allow sufficient time to complete the renewal process. The renewal application contains the same forms used for initial application, and the laboratory need only indicate where changes have occurred from the previous period in personnel, equipment, facilities, or the scope of accreditation desired.

With the exception of an initiation fee for new applicants, the technical requirements and fees are the same as for initial accreditation. The application and fees must be received by NBS prior to expiration of the laboratory's current accreditation to avoid a lapse in accreditation.

PUBLICIZING ACCREDITATION STATUS

BY NVLAP

NVLAP publishes an annual Directory of Accredited Laboratories. The Directory contains the name and address, scope of accreditation, contact person, and the accreditation renewal date for each accredited laboratory. Supplements to the Directory are published quarterly to cover interim accreditation actions including initial accreditations, renewals, suspensions, terminations, and revocations. The Directory is distributed nationally and internationally to manufacturers, suppliers, retailers, professional and trade associations, code groups, and government agencies.

BY LABORATORIES

Accredited laboratories are encouraged, within specified limits, to publicize their accredited status. The major restriction is that advertising must not imply product certification by NBS or the U.S. Government. Laboratories and their clients may not reference their accredited status in consumer media, in product advertising, or on product labels, containers or packaging.

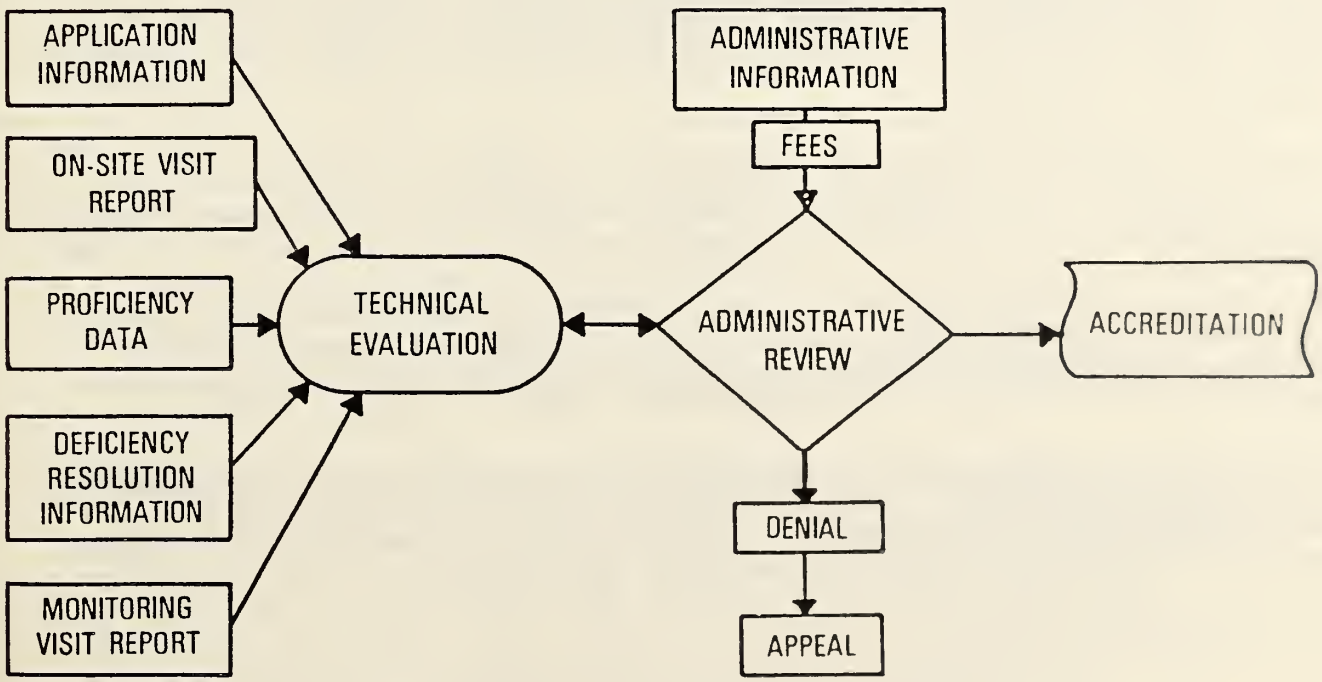
A laboratory may cite its accredited status and use NVLAP logos on reports, stationery, and in business and trade publications provided that it is clearly indicated that it is the laboratory which is accredited. NVLAP Lab Bulletin No. 3A provides more detailed guidance on how a laboratory may publicize its accredited status and the statements which may be made. (See Appendix.)

COMPLIANCE WITH EXISTING LAWS

Accreditation does not relieve the laboratory of the need to observe and comply with existing Federal, State, and local statutes, ordinances, or regulations that may be applicable to its operations, including consumer protection and antitrust laws.

ACCREDITATION PROCESS

Accreditation is granted following successful completion of a process which includes submission of an application and payment of fees by the laboratory, an on-site assessment, resolution of deficiencies identified during the on-site assessment, participation in proficiency testing, technical evaluation, and administrative review. A diagram of the accreditation process is shown in the figure below.



APPLICATION AND FEES

An Application Package is sent to a laboratory on request. It includes: General Application Forms, a Fee Calculation Sheet, and this document. The General Application Form must be completed and signed by an authorized representative of the laboratory. The authorized representative is one who can act on behalf of the laboratory and commit it to fulfill the NVLAP requirements. Before completing and signing the application, the authorized representative should review all documents and become totally familiar with NVLAP requirements. Although other laboratory staff may be designated to perform activities, such as handling proficiency testing or receiving an assessor, the authorized representative is the only one who can authorize a change in the scope or nature of the application.

In general, the accreditation fee is composed of several parts, some of which are fixed while others depend on the scope of accreditation desired and the specifics of the LAP. The total accreditation fee must be paid before accreditation can be granted. The individual parts of the accreditation fee include, as appropriate: a one-time LAP initiation fee for new applicants, an administrative fee, test method fees, an assessment fee, and proficiency testing fees. The fees for this LAP are shown in the Fee Calculation Sheet included in the LAP Application Package.

The laboratory will be scheduled for an on-site assessment after payment of all required fees and will be notified of any additional information which must be supplied and of any applicable proficiency testing requirements which must be completed for the technical evaluation.

APPROVED SIGNATORY

Under NVLAP criteria, an accredited laboratory must have one or more individuals or laboratory positions designated as having responsibility for signing "all test reports endorsed with the NVLAP logo." This is the person(s) to whom NVLAP, laboratory clients, or others would go in case of questions or problems with the report.

There is no formal requirement for nomination or approval of persons or laboratory positions designated as approved signatories. The laboratory should inform NVLAP of its appointments by completing the appropriate sections in the application for accreditation. Approved signatories should be: persons or positions with adequate responsibility or authority within the organization, with adequate and appropriate technical capabilities, and without conflict of interest. The approved signatory may be the authorized representative who is responsible for signing the NVLAP Application Form.

Laboratory test reports carrying the NVLAP logo need not be signed individually by the approved signatory. Test report forms may be preprinted with the required information. Forms that are electronically or computer generated may have the information printed along with the test results.

TECHNICAL EXPERTS

NVLAP uses Technical Experts (TEs) as assessors and evaluators. These are individuals knowledgeable in the testing field being evaluated. They may be engineers or scientists currently active in the field, consultants, college professors or retired persons. They are selected on the basis of their professional and academic achievements, experience in the field of testing, management experience, and tact in dealing with people. Their services are generally contracted as required; they are not NVLAP staff members.

Assessors are TEs selected to conduct an on-site assessment of a particular laboratory on the basis of how well their individual experience matches the type of testing to be assessed, as well as absence of conflicts of interest. The laboratory has the right to appeal the assignment of an assessor and may request an alternate.

Evaluators are TEs selected to review the record of the laboratory as a whole, including the application, assessment report, deficiencies, corrections to deficiencies, and proficiency test results and, based on this record, to recommend whether or not a laboratory should be accredited. The evaluators are matched to the type of testing being evaluated and are selected to avoid conflicts of interest.

ON-SITE ASSESSMENT

Before initial accreditation and periodically thereafter, an on-site assessment of each laboratory is conducted to determine compliance with the NVLAP criteria. The assessment is conducted by one or more NVLAP assessors selected on the basis of their expertise in the field of testing to be reviewed. Assessors use checklists developed by NVLAP so that each laboratory receives an assessment comparable to that received by others. However, assessors have considerable latitude to make judgments about a laboratory's compliance with the NVLAP criteria, depending on the assessor's experience and the unique circumstances of the laboratory.

Each laboratory will be contacted to arrange a mutually agreeable date for an asessment. The time needed to conduct an assessment varies, but two days is the norm. Every effort is made to conduct an assessment with as little disruption as possible to the normal operations of the laboratory. During the assessment the assessor will carry out the following functions:

- meet with management and supervisory personnel responsible for the laboratory's activities (for which accreditation is being sought) to review the assessment process with the individuals involved and to set the assessment agenda.

- examine the quality assurance system employed by the laboratory. The assessor may select and trace the history of one or more samples from receipt to final issuance of test reports. The assessor will conduct a thorough review of the laboratory's quality manual or equivalent, evaluate the training program, examine notebooks or records pertaining to the samples, check sample identification and tracking procedures, determine whether the appropriate environmental conditions are maintained, and examine copies of completed test reports.

- review records of periodic internal audits, use of check samples or participation in round robin testing or other similar programs.

- review personnel records including resumes and job descriptions of key personnel, competency evaluations for all staff members who routinely perform the testing for which accreditation is sought, calibration or verification records for apparatus used, test reports, and sample control records.

- observe demonstrations of testing techniques and discuss them with the technical personnel to assure their understanding of the procedures.

- examine major equipment, apparatus, and facilities.

At the conclusion of the assessment, the assessor will conduct an exit briefing to discuss his or her observations with appropriate laboratory staff and call attention to any deficiencies uncovered. A written summary of any deficiencies discussed will be left at the laboratory. The assessor will forward the assessment forms and a written summary to NBS.

> If deficiencies have been noted, the laboratory must, within 30 days of the date of this notification provide NVLAP with documentation or certification, by the authorized representative, that the specified deficiencies have been corrected or that sp cific actions are being taken to correct the deficiencies.

A laboratory applying for initial accreditation may request an extension to complete required corrections.

If any deficiencies are noted at laboratories which are currently accredited, such deficiencies must be corrected within 30 days after notification or the laboratory may face possible revocation, suspension, or expiration of its accreditation. Any test equipment that is identified as out-of-calibration, should not be used until corrective action has been completed. All deficiencies noted for corrective action will be subject to thorough review and verification during subsequent assessments and technical evaluations.

MONITORING VISITS

In addition to regularly scheduled assessments, monitoring visits may be conducted by assessors or by NBS staff at any time during the accreditation period. Monitoring visits may occur for cause or on a random selection basis. These visits serve to verify reported changes in the laboratory's personnel, facilities, and operations or to explore possible reasons for poor performance in proficiency testing.

The scope of a monitoring visit may range from checking a few designated items to a complete review. Failure to cooperate with NVLAP assessors will be grounds for initiation of adverse accreditation action. No additional fee is required for the monitoring visit.

PROFICIENCY TESTING

Proficiency testing is an integral part of the NVLAP accreditation process. Demonstration of appropriate facilities, equipment, personnel, etc. is essential, but may not be sufficient for the evaluation of laboratory competence. The actual determination of test data using special proficiency testing samples provides NVLAP with a way to determine the overall effectiveness of the laboratory.

Proficiency testing is a process for checking actual laboratory testing performance, usually by means of interlaboratory comparisons. Each LAP has unique proficiency testing requirements. The data are analyzed by NVLAP and summary reports of the results are sent back to the participants.

For many test methods, results from proficiency testing are very good indicators of a laboratory's testing capability. Information obtained from proficiency testing helps to identify problems in a laboratory. When problems are found, NVLAP staff members work with the laboratory staff to solve them. If problems with the test method are suspected, NVLAP provides information to the appropriate standards-writing bodies.

The specific proficiency testing requirements for this LAP are included in Section V of this document.

TECHNICAL EVALUATION

After a laboratory has completed all the technical requirements of a LAP and is ready for an accreditation action, a final technical evaluation is conducted by experts chosen for their experience and knowledge of the pertinent test methods. They review records on each applicant laboratory and base their evaluation on:

- information provided on the application;
- on-site assessment reports;
- actions taken by the laboratory to correct deficiencies;
- results of proficiency testing; and
- information from any monitoring visits of the laboratory.

If the technical evaluation reveals additional deficiencies, written notification describing them will be made to the laboratory. The laboratory must respond within 30 days of such notification and provide documentation or certification by the authorized representative that the specified deficiencies have been corrected. Clarification of some issues may be requested by telephone. All deficiencies must be corrected before accreditation can be granted or renewed.

ADMINISTRATIVE REVIEW

After the technical evaluation has been completed, the NVLAP staff prepares an administrative recommendation that the laboratory either be granted or denied accreditation. This recommendation is based on a review of the technical evaluation and other records to ensure that all NVLAP technical, financial and administrative obligations have been satisfied.

ACCREDITATION ACTIONS

Acting for the Director of NBS, the Director of the NBS Office of Product Standards Policy makes the following decisions.

Accreditation — If accreditation is recommended, the recommendation forms the basis for granting accreditation. A **Certificate of Accreditation** will be issued to the laboratory.

Denial — If denial is recommended, the laboratory is notified of a proposal to deny accreditation and the reason(s) therefor.

Suspension — If a laboratory is found to have violated the terms of its accreditation, the accreditation can be suspended. The laboratory will be notified of the reasons for and conditions of the suspension and the action(s) that the laboratory must take to have accreditation reinstated.

Revocation — If a laboratory is found to have violated the terms of its accreditation, the laboratory is notified of a proposal to revoke accreditation and the reasons therefor. The laboratory may be given the option of voluntarily terminating accreditation. If accreditation is revoked, the laboratory must return its **Certificate of Accreditation** and cease use of the NVLAP logo on any of its reports, other correspondence, or advertising.

If denial or revocation has been proposed, the laboratory may request a hearing, under United States Code 5 U.S.C. 556, within 30 days of the date of receipt of the notification. If a hearing is not requested, the action becomes final upon the expiration of that 30-day period.

After a participant's accreditation has been terminated, whether voluntarily or through adverse action, the accreditation certificate must be returned to NVLAP. If a laboratory elects not to renew or wishes to voluntarily terminate its accreditation at any time, the notification of such intention should be forwarded to NBS in writing.

IV. TECHNICAL REQUIREMENTS

The requirements discussed in this section interpret the NVLAP criteria for application to the Commercial Products LAP. These requirements do not supersede the published NVLAP criteria which are included in the Appendix.

SCOPE OF THE LAP

The Commercial Products LAP covers tests for paint and related coatings and materials, paper and related products, and mattresses. The test methods for which a laboratory may seek accreditation are listed in the Appendix. Other test methods may be added to the LAP, upon request, if they are found to be appropriate.

The 127 paint test methods are divided into four categories:

(1) Measurements of intrinsic physical properties;
(2) Measurements of performance and performance change;
(3) Measurement of chemical properties and compositions; and
(4) Test sample conditioning and preparation.

The 61 paper test methods are also divided into four categories:

(1) Paper and paperboard;
(2) Paper specifications;
(3) Pressure sensitive tapes; and
(4) Packaging.

All of the six test methods for mattresses are in a single category.

QUALITY ASSURANCE SYSTEM

The key to a properly functioning organization is that it has and maintains a system of procedures and practices which assure the quality of its services. To qualify for accreditation, an applicant must demonstrate that its quality assurance systems ensure the technical integrity of its work.

DOCUMENTATION

A laboratory must have up-to-date documentation which thoroughly describes all its procedures and practices. The written descriptions should contain such items as the method of implementation, responsible personnel, recordkeeping system, operating procedures, procedures to employ in the event of unusual or non-standard circumstances, and scheduling. Written descriptions should include at least the following topics:

- Organizational chart;
- Laboratory facilities and scope of services offered;
- Job/position description for all personnel;
- Personnel training procedures;
- Personnel competency assurance procedures;
- Test equipment inventory;
- Test equipment calibration, verification, and maintenance practices;
- Test performance plan;
- Specimen selection, handling, analysis, control, and identification;
- Data handling and reporting;
- Internal checks and audits;
- External standardization practices;
- Reference standards and/or materials; and
- Subcontracting practices and procedures for assuring quality

This documentation should be in the form of a manual but may be individual sheets in various locations throughout the facility. If individual sheets are used, a central reference document must be available to indicate where the sheets may be found. The documentation must be in a format and style which can be easily understood by technicians. It must be readily accessible to all staff members.

PERSONNEL

Training:

Each new staff member must be trained for assigned duties and existing staff members must be retrained when testing equipment and/or protocols are changed or they are assigned new responsibilities. Each staff member must receive (or have had) training for assigned duties either through on-the-job training, formal classroom sessions or through technician certification programs.

Competency:

In addition to training, the supervisor must evaluate the competency of each staff member by observing the performance of each testing protocol each staff member is authorized to conduct. The performance observation must be conducted annually by the immediate supervisor or his designee. A record of the staff member's performance must be placed in the personnel file, dated and signed by the supervisor.

Technical Director:

The laboratory technical director shall be a professional experienced in the testing area for which accreditation is desired. This individual should have the technical competence and the supervisory responsibility to direct the work of professionals and technicians in the appropriate area. Responsibility for the quality assurance program may reside with the technical director or with another individual having knowledge and experience in quality assurance who has a direct line of communication to the technical director and other organizational management.

The assessor will review resumes or other information to substantiate the qualifications of the Technical Director and all key individuals.

Any organizational or personnel changes that could affect the performance of the testing service (e.g., Technical Director, technical supervision, responsibility for quality assurance program) shall be reported to NVLAP within 30 calendar days of such change.

EQUIPMENT AND FACILITIES

A laboratory must have adequate equipment to perform the type(s) of testing for which capability is claimed. This includes adequate space to perform the testing, environmental controls, adequate testing equipment, adequate safety systems and either properly calibrated laboratory standards or access to the services of a competent calibration laboratory.

EQUIPMENT MAINTENANCE AND CALIBRATION

All equipment used in the testing of the commercial products and to perform quality control must be adequately maintained so that it can accomplish the required measurements.

Measurement or quality control equipment that is inherently subject to change due to use or passage of time, must be periodically calibrated. Calibration means comparison with a reference standard so that the performance of a measuring instrument may be determined with sufficient accuracy.

Calibrations of equipment may be performed by the laboratory or by an external calibration service. All calibrations and characterizations must be done against reference standards that are traceable to national standards maintained by NBS or by an equivalent foreign national standards authority. To be traceable means the ability to show that appropriate documented actions were taken to compare (either directly or indirectly) a reference standard with a national standard.

The reference standards used and the environmental conditions at the time of calibration must be documented for all calibrations. Calibration records and evidence of the traceability of the reference standards used must be made available for inspection during the on-site visit.

Testing equipment or verification records should include the following: equipment name or description; model, style, or serial number; manufacturer; notation of all equipment variables requiring verification; the range of verification; the resolution of the instrument and its allowable error; verification date and schedule; date and result of last calibration; identity of the laboratory individual or external service responsible for calibration; source of reference standard and traceability.

RECORDKEEPING

A laboratory must maintain a functional recordkeeping system. This means that records must be easily accessible, in some logical order and contain complete information on the subject. Records covering the following items are required and will be reviewed during the on-site visit either in total or by selected sampling:

- Staff training dates and results;
- Staff competency review dates and results;
- Testing equipment calibration and maintenance;
- Results of incoming inspection of materials;
- Comprehensive logs of test activities;
- Results of internal and external equipment checks, measurement assurance programs, quality audits, etc.;
- Test data and reports; and
- Tracking and logging of samples tested.

Sample tracking and logging records should trace the movement of each sample through the testing facility from its receipt through all the tests performed to the final test report. Dates, times, condition of item and personnel involved should all be included.

TEST REPORT

The test report to the client must include:

- Name and address of laboratory;
- Pertinent dates and identifying numbers;
- Client name;
- Description or identification of each sample;
- Identification of the test method, procedures, or specifications;
- Identification of known deviations, additions to, or exclusions from the test method;
- Measurements, examinations, or derived results, and identification of test anomalies;
- A statement, if necessary, as to whether or not the test results comply with the requirements of product or project specifications;
- Signature of person having technical responsibility for the test report; and
- All other items required by the test method.

Records of these reports must be maintained for at least three years.

V. PROFICIENCY TESTING

Proficiency testing is an integral requirement of the NVLAP evaluation process. NBS either conducts the proficiency testing program for the LAP or determines if a collaborative reference program or round-robin testing program exists which can meet the testing requirements for the LAP. The proficiency testing requirements for the Commercial Products LAP are described below.

PAINT AND RELATED COATINGS AND MATERIALS

In 1983, the Federation of Societies for Coatings Technology (FSCT), in association with Collaborative Testing Services, Inc., (CTS), McLean, Virginia, established a proficiency testing program for paints and coatings. The program provides participating testing laboratories a means of periodically comparing the results of their testing with those of other laboratories in the paint and coatings industry.

Six times a year, CTS distributes samples, instructions, and data sheets so that participating laboratories can perform two different test methods. Laboratories accredited by NVLAP for testing paints and related coatings are required to be enrolled in the CTS/FSCT program for paints and coatings. The laboratory applies and pays proficiency testing fees directly to CTS. CTS provides NVLAP with summary reports of the test results for each test method and, with permission of the laboratory, identifies those laboratories in the report which are accredited or seeking NVLAP accreditation.

The test methods included in the CTS proficiency testing program for paints and coatings, which are applicable to the Commercial Products LAP, are listed below.

Test Method Designation	Short Title
ASTM D523	Specular Gloss
ASTM D562	Consistency of Paints Using the Stormer Viscometer
ASTM D1200	Viscosity of Paints, Varnishes, and Lacqers by Ford Viscosity Cup
ASTM D1210	Fineness of Dispersion of Pigment-Vehicle Systems
ASTM D1475	Density of Paint, Varnish, Lacquer, and Related Products
ASTM D2805	Hiding Power of Paints
ASTM D2369	Volatile Content of Paints
ASTM D2832	Nonvolatile Content of Paint and Paint Materials
ASTM D3723	Pigment Content of Water-Emulsion Paints by Low-Temperature Ashing
ASTM D3960	Volatile Organic Contents (VOC) of Paints and Related Coatings
ASTM D4017	Water in Paints and Paint Materials by Karl Fischer Method

PAPER AND RELATED PRODUCTS AND PACKAGING

In 1969 the National Bureau of Standards (through the Research Associate Program) and the Technical Association of the Pulp and Paper Industry (TAPPI) established a Collaborative Reference Program for Paper. The purpose of this program is to provide participating laboratories a means of periodically comparing the level and uniformity of their testing with those of other laboratories. NBS no longer participates in the program, which is operated and maintained by Collaborative Testing Services (CTS). TAPPI provides a Technical Advisory Committee to guide the program.

CTS distributes samples, instructions, and data sheets periodically during the testing year. Laboratories accredited by NVLAP for testing paper and related products and packaging are required to be enrolled in the CTS/TAPPI program. The laboratory applies and pays proficiency testing fees directly to CTS. CTS provides NVLAP with summary reports of the test results for each test method and, with permission of the laboratory, identifies those laboratories which are accredited or seeking accreditation under NVLAP.

Samples of two types of paper are distributed six times during the program year. Corrugated fiberboard samples are distributed three times per year.

Test methods included in the CTS proficiency testing program for paper and related products and packaging which are applicable to the Commercial Products LAP are listed below.

Test Method Designation	Short Title
TAPPI T403-OS	Bursting Strength of Paper
TAPPI T404-OM	Tensile Breaking Strength and Elongation of Paper and Paperboard
TAPPI T410-OM	Grammage of Paper and Paperboard
TAPPI T411-OM	Thickness (Caliper) of Paper and Paperboard
TAPPI T412-OM	Moisture in Paper and Paperboard
TAPPI T414-OM	Internal Tearing Resistance of Paper
TAPPI T425-OM	Opacity of Paper (15% Diffuse Illuminant A, 89% Reflectance Backing and Paper Backing)
TAPPI T452-OM	Brightness of Pulp, Paper and Paperboard (Directional Reflectance at 457 nm)
TAPPI T459-OM	Surface Strength of Paper (Wax Pick Test)
TAPPI T460-OM	Air Resistance of Paper
TAPPI T480-OS	Specular Gloss of Paper and Paperboard at 75 Degrees
TAPPI T489-OS	Stiffness of Paperboard
TAPPI T494-OM	Tensile Breaking Properties of Paper and Paperboard (Using Constant Rate of Elongation Apparatus)
TAPPI T511-OM	Folding Endurance of Paper (MIT Tester)
TAPPI T538-PM	Sheffield Smoothness of Paper and Paperboard (Air Flow Method)
TAPPI T808-OS	Flat Crush Test of Corrugated Board
TAPPI T810-OM	Bursting Strength of Corrugated and Solid Fiberboard
TAPPI T811-OS	Edgewise Compressive Strength of Corrugated Fiberboard (Short Column Test)
TAPPI T818-OM	Ring Crush of Paperboard

MATTRESSES

Proficiency Testing Program for mattresses has not been established.

APPENDICES

NVLAP Accreditation Criteria

NVLAP Lab Bulletin No. 3A

Test Method List

NVLAP Accreditation Criteria

SUBPART D - CONDITIONS AND CRITERIA FOR ACCREDITATION

Sec. 7.31 Application of accreditation conditions and criteria.

(a) To become accredited and maintain accreditation, a laboratory must meet the conditions for accreditation set out in Section 7.32 and the criteria set out in Section 7.33 as tailored for specific LAPs.

(b) The conditions leading to accreditation include acceptance of the responsibilities of an accredited laboratory and requirements for information disclosure.

(c) The criteria are tailored and interpreted for the test methods, types of test methods, products, services or standards of the relevant LAP. These tailored criteria are the technical requirements for accreditation developed through the procedures of Section 7.15.

(d) In applying the conditions, criteria, and technical requirements for accreditation, the Director of OPSP shall not:

(1) Prohibit accreditation solely on the basis of a laboratory's affiliation or nonaffiliation with manufacturing, distributing, or vending organizations, or because the laboratory is a foreign firm; or

(2) Develop, modify, or promulgate test methods, standards, or comparable administrative rules.

Sec. 7.32 Conditions for accreditation.

(a) To become accredited and maintain accreditation, a laboratory shall agree in writing to:

(1) Be assessed and evaluated initially and on a periodic basis;

(2) Demonstrate, on request, that it is able to perform the tests representative of those for which it is seeking accreditation;

(3) Pay all relevant fees;

(4) Participate in proficiency testing as required.

(5) Be capable of performing the tests for which it is accredited according to the latest version of the test method within one year after its publication or within another time limit specified by the Director of OPSP;

(6) Limit the representation of the scope of its accreditation to only those tests or services for which accreditation is granted;

(7) Limit all its test work or services for clients to those areas where competence and capacity are available;

(8) Limit advertising of its accredited status to letterheads, brochures, test reports, and professional, technical, trade, or other laboratory services publications, and use the NVLAP logo under guidance provided by the Director of OPSP;

(9) Inform its clients that the laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NBS;

(10) Maintain records of all actions taken in response to testing complaints for a minimum of one year;

(11) Maintain an independent decisional relationship between itself and its clients, affiliates, or other organizations so that the laboratory's capacity to render test reports objectively and without bias is not adversely affected;
(12) Report to the Director of OPSP within 30 days any major changes involving the location, ownership, management structure, authorized representative, approved signatories, or facilities of the laboratory; and
(13) Return to the Director of OPSP the certificate of accreditation for possible revision or other action should it:
(i) be requested to do so by the Director of OPSP;
(ii) voluntarily terminate its accredited status; or
(iii) become unable to conform to any of these conditions or the applicable criteria of Section 7.33 and related technical requirements.

(b) To become accredited and maintain accreditation, a laboratory shall supply, upon request, the following information:
(1) Legal name and full address;
(2) Ownership of the laboratory;
(3) Organization chart defining relationships that are relevant to performing testing covered in the accreditation request;
(4) General description of the laboratory, including its facilities and scope of operation;
(5) Name and telephone number of the authorized representative of the laboratory;
(6) Names or titles and qualifications of laboratory staff nominated to serve as approved signatories of test reports that reference NVLAP accreditation; and
(7) Other information as may be needed for the specific LAP(s) in which accreditation is sought.

Sec. 7.33 Criteria for accreditation.

(a) Quality System. (1) The laboratory shall operate under an internal quality assurance program appropriate to the type, range, and volume of work performed. The quality assurance program must be designed to ensure the required degree of accuracy and precision of the laboratory's work and should include key elements of document control, sample control, data validation, and corrective action. The quality assurance program must be documented in a quality manual or equivalent (e.g., operations notebook) which is available for use by laboratory staff. A person(s) must be identified as having responsibility for maintaining the quality manual.
(2) The quality manual must include as appropriate:
(i) The laboratory's quality assurance policies including procedures for corrective action for detected test discrepancies;
(ii) Quality assurance responsibilities for each function of the laboratory;
(iii) Specific quality assurance practices and procedures for each test, type of test, or other specifically delineated function performed;
(iv) Specific procedures for retesting, control charts, reference materials, and interlaboratory tests; and
(v) Procedures for dealing with testing complaints.
(3) The laboratory shall periodically review its quality assurance system by or on behalf of management to ensure it's continued effectiveness. These reviews must be recorded with details of any corrective action taken.

(b) Staff. (1) The laboratory shall:
(i) Be staffed by individuals having the necessary education, training, technical knowledge, and experience for their assigned functions; and
(ii) Have a job description for each professional, scientific, supervisory and technical position, including the necessary education, training, technical knowledge, and experience.
(2) The laboratory shall document the test methods each staff member has been assigned to perform.
(3) The laboratory shall have a description of its training program for ensuring that new or untrained staff are able to perform tests properly and uniformly to the requisite degree of precision and accuracy.
(4) The laboratory shall be organized:
(i) So that staff members are not subjected to undue pressure or inducement that might influence their judgment or results of their work; and
(ii) In such a way that staff members are aware of both the extent and the limitation of their area of responsibility.
(5) The laboratory shall have a technical manager (or similar title) who has overall responsibility for the technical operations of the laboratory.
(6) The laboratory shall have one or more signatories approved by the Director of OPSP to sign test reports that reference NVLAP accreditation. Approved signatories shall:
(i) Be competent to make a critical evaluation of test results; and
(ii) Occupy positions within the laboratory's organization which makes them responsible for the adequacy of test results.

(c) Facilities and Equipment. (1) The laboratory shall be furnished with all items of equipment and facilities for the correct performance of the tests and measurements for which accreditation is granted and shall have adequate space, lighting, and environmental control, and monitoring to ensure compliance with prescribed testing conditions.
(2) All equipment must be properly maintained to ensure protection from corrosion and other causes of deterioration. Instructions for a proper maintenance procedure for those items of equipment which require periodic maintenance must be available. Any item of equipment or component thereof which has been subjected to overloading or mishandling, gives suspect results, or has been shown by calibration or otherwise to be defective, must be taken out of service and clearly labelled until it has been repaired. When placed back in service, this equipment must be shown by test or calibration to be performing its function satisfactorily.
(3) Records of each major item of equipment must be maintained. Each record must include:
(i) The name of the item of equipment;
(ii) The manufacturer's name and type, identification and serial number;
(iii) Date received and date placed in service;
(iv) Current location, where appropriate;
(v) Details of maintenance; and
(vi) Date of last calibration, next calibration due date, and calibration report references.

(d) Calibration. The laboratory shall:
(1) Calibrate new testing equipment before putting it into service;
(2) Recalibrate, at regular intervals, in-service testing equipment with the calibration status readily available to the operator;
(3) Perform checks of in-service testing equipment between the regular calibration intervals, where relevant;
(4) Maintain adequate records of all calibrations and recalibrations; and
(5) Provide traceability of all calibrations and reference standards of measurement where these standards exist. Where traceability of measurements to primary (national or international) standards is not applicable, the laboratory shall provide satisfactory evidence of the accuracy or reliability of test results (e.g., by participation in a suitable program of interlaboratory comparison).

(e) Test Methods and Procedures. The laboratory shall:
(1) Conform in all respects with the test methods and procedures required by the specifications against which the test item is to be tested, except that whenever a departure becomes necessary for technical reasons the departure must be acceptable to the client and recorded in the test report;
(2) Have data to prove that any departures from standard methods and/or procedures due to apparatus design or for other reasons do not detract from the expected or required precision of the measurement;
(3) Maintain a test plan for implementing testing standards and procedures including adequate instructions on the use and operation of all relevant equipment, on the handling and preparation of test items (where applicable), and on standard testing techniques where the absence of such instructions could compromise the test. All instructions, testing standards, specifications, manuals, and reference data relevant to the work of the laboratory must be kept up-to-date and made readily available to the staff;
(4) Maintain measures for the detection and resolution of in-process testing discrepancies for manual and automatic test equipment and electronic data processing equipment, where applicable;
(5) Maintain a system for identifying samples or items to be tested, which remains in force from the date of receipt of the item to the date of its disposal, either through documents or through marking to ensure that there is no confusion regarding the identity of the samples or test items and the results of the measurements made; and
(6) Maintain rules for the receipt, retention, and disposal of test items, including procedures for storage and handling precautions to prevent damage to test items which could invalidate the test results. Any relevant instructions provided with the tested item must be observed.

(f) Records. The laboratory shall:
(1) Maintain a record system which contains sufficient information to permit verification of any issued report;
(2) Retain all original observations, calculations and derived data, and calibration records for one year unless a longer period is specified; and
(3) Hold records secure and in confidence, as required.

(g) Test Reports. (1) The laboratory shall issue test reports of its work which accurately, clearly, and unambiguously present the specified test results and all required information. Each test report must include the following information as applicable:

(i) Name and address of the laboratory;
(ii) Identification of the test report by serial number, date, or other appropriate means;
(iii) Name and address of client;
(iv) Description and identification of the test specimen, sample, or lot of material represented;
(v) Identification of the test specification, method, or procedure used;
(vi) Description of sampling procedure, if appropriate;
(vii) Any deviations, additions to, or exclusions from the test specifications;
(viii) Measurements, examinations, and derived results supported by tables, graphs, sketches, and photographs, as appropriate, and any failures identified;
(ix) A statement of measurement uncertainty where relevant;
(x) Identification of the organization and the person accepting technical responsibility for the test report and date of issue;
(xi) A statement that the report must not be reproduced except in full with the approval of the laboratory; and
(xii) A statement to the effect that the test report relates only to the items tested.

(2) The laboratory shall issue corrections or additions to a test report only by a further document suitably marked, e.g. "Supplement to test report serial number .....," which meets the relevant requirements of Section 7.33(g)(1).

(3) The laboratory shall retain a copy of each test report issued for one year unless a longer period is specified by the Director of OPSP.

(4) The laboratory shall ensure that all test reports endorsed with the NVLAP logo are signed by an approved signatory.

National Voluntary
Laboratory Accreditation
Program

NVLAP

U.S. Department of Commerce
in cooperation with the
National Bureau of Standards

Bulletin

Lab Bulletin No. 3A

January 1, 1985

INFORMING THE PUBLIC OF YOUR ACCREDITATION STATUS

Summary

This Bulletin supersedes NVLAP Lab Bulletin No. 3 dated October 1, 1981. It reflects significant changes made to the NVLAP procedures (Title 15, Part 7, of the Code of Federal Regulations) which became effective on December 10, 1984.

The Bulletin is addressed primarily to personnel at accredited laboratories who are responsible for communicating the laboratory's accreditation status to clients and the public, through advertising, issuance of test reports, use of the NVLAP logo, etc.

The Bulletin's purpose is to "provide guidance on referencing the laboratory's accredited status, and use of the NVLAP logo by the laboratory and its clients," in accordance with provisions of the NVLAP Procedures.

Background

NVLAP was established to assist industry and government in identifying competent testing laboratories. NVLAP accreditation means that a laboratory is competent to perform specific test methods in selected fields of testing. The NVLAP Procedures are the bases upon which the entire program operates and accomplishes accreditation of laboratories. Parts A and B of the Procedures provide general information and the method by which a new Laboratory Accreditation Program (LAP), in a new field of testing, may be requested and established. Parts C and D of the Procedures , of more concern to accredited laboratories, describe how a laboratory becomes accredited and the conditions and criteria for initial and continued accreditation. This Bulletin is concerned principally with issues in Part D of the Procedures.

Requirements and Guidance

To become accredited and maintain accreditation a laboratory shall:

> limit the representation of the scope of its accreditation to only those tests or services for which accreditation is granted

A laboratory accredited by NVLAP may use the following statement on its letterheads and in trade or other publications: "Accredited by the National Bureau of Standards, National Voluntary Laboratory Accreditation Program for selected test methods for --(identify product or service area(s))." This statement could, for example, be placed at the bottom of the laboratory letterhead.

A laboratory's letterhead containing a reference to its NVLAP accreditation may be used in any direct solicitation for business from potential customers. It is recommended that a copy of the NVLAP Certificate and Scope of Accreditation be appended to such a solicitation.

To become accredited and maintain accreditation a laboratory shall:

> limit advertising of its accredited status to letterheads, brochures, test reports, and professional, technical, trade, or other laboratory services publications, and use the NVLAP logo under guidance provided by NBS

A statement about NVLAP accreditation and the NVLAP logo may be used on reports and data sheets containing test data obtained by a laboratory provided the tests or services are performed in accordance with the terms of its accreditation. The NVLAP logo may not be used on test reports or data sheets during any period of suspended or expired accreditation or after voluntary or involuntary termination of accreditation.

The nature or type of product advertising prohibited by NVLAP procedures includes any advertising that is intended to encourage a consumer to purchase a product because it was tested by an accredited laboratory, whether that advertising appears in consumer media, the business media, or at a point of sale to consumers.

News stories and advertising by laboratories of their accredited status in the trade press is not only permissible but encouraged. The use of advertisements in the trade press is consistent with NVLAP procedures.

The "consumer media" to be avoided include popular periodicals such as Time, Good Housekeeping, etc., and newspapers such as the Washington Post or the New York Times. The term "consumer media" does not include business publications such as Barron's, or the Wall Street Journal which are oriented to the business community and in which products per se normally are not advertised.

To become accredited and maintain accreditation a laboratory shall:

> **inform its clients that the laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NBS**

Laboratory accreditation by NBS confers recognition that a laboratory has been found competent to perform specific test methods or services in a selected field(s) of testing. Laboratories must avoid all inference that accreditation under NVLAP carries with it an endorsement, approval, or recommendation of the products tested by the laboratories.

To become accredited and maintain accreditation a laboratory shall:

> **assure that all test reports endorsed with the NVLAP logo are signed by an approved signatory**

An approved signatory is an officer or employee of the laboratory, identified by name or position, who has been accepted by NVLAP as being responsible for the issuance of test reports under this condition of NVLAP accreditation. A laboratory seeking initial accreditation or reaccreditation must specify (a) one or more individuals, or (b) position(s) within the organization for which it requests acceptance as an approved signatory.

Computer or machine generated test reports that contain the NVLAP logo need not be signed but must have the printed name of the approved signatory.

Questions About Accreditation

If you have questions about what is an acceptable method of advertising in areas not specifically covered in this Lab Bulletin, or about the propriety or acceptability of a particular statement, advertising media, or use of information about your NVLAP accreditation status, please contact NVLAP before your publicity program is implemented.

Call 301 -975-4016 or

Send your questions to:

Harvey W. Berger
Manager, Laboratory Accreditation
National Bureau of Standards
ADMIN A531
Gaithersburg, MD 20899

National Voluntary Laboratory Accreditation Program
(NVLAP)

NVLAP-09 COMMERCIAL PRODUCTS TESTING
(COMMERCIAL PRODUCTS LAP)

Test Method List

Test Method Designation	Short Title
	Paints and Related Coatings and Materials
	Measurements of Intrinsic Physical Properties
ASTM D56	Flash Point by Tag Closed Tester
ASTM D93	Flash Point by Pensky-Martens Closed Tester
ASTM D153	Specific Gravity of Pigments
ASTM D185	Coarse Particles in Pigments, Pastes and Paints
ASTM D281	Oil Absorption of Pigments by Spatula Rub-Out
ASTM D387	Color and Strength of Color Pigments With a Mechanical Muller
ASTM D523	Specular Gloss
ASTM D562	Consistency of Paints Using the Stormer Viscometer
ASTM D1005	Film Thickness of Organic Coatings
ASTM D1186	Film Thickness of Non-magnetic Coatings Applied to a Ferrous Base
ASTM D1200	Viscosity of Paints, Varnishes, and Lacquers by Ford Viscosity Cup
ASTM D1210	Fineness of Dispersion of Pigment-Vehicle Systems
ASTM D1212	Wet Film Thickness of Organic Coatings
ASTM D1296	Odor of Volatile Solvents and Diluents
ASTM D1310	Flash-Point of Liquids by Tag Open-Cup Apparatus
ASTM D1400	Dry Film Thickness of Non-conductive Coatings Applied to a Nonferrous Metal Base
ASTM D1475	Density of Paint, Varnish, Lacquer, and Related Products
ASTM D1544	Color of Transparent Liquids (Gardner Color Scale)
ASTM D1729	Visual Evaluation of Color Differences of Opaque Materials
ASTM D2244	Instrumental Evaluation of Color Difference of Opaque Materials
ASTM D3278	Flash Point of Liquids by Setaflash Closed Tester
ASTM D3363	Film Hardness by Pencil Test
ASTM D3793	Low-Temperature Coalescence of Latex Paint Films
ASTM D4061	Specific Luminance of Horizontal Coatings
ASTM D4212-82	Viscosity by Dip-Type Viscosity Cups
ASTM E97	45- deg, 0-deg Directional Reflectance Factor of Opaque Specimens by Broad-Band Filter Reflectometry
ASTM E308	Spectrophotometry and Description of Color in CIE 1931 System
ASTM E313	Indexes of Whiteness and Yellowness of Near-White Opaque Materials
ASTM E430	Gloss of High-Gloss Surfaces by Goniophotometry

Measurements of Performance and Performance Change

ASTM D279	Bleeding of Pigments
ASTM D332	Tinting Strength of White Pigments
ASTM D344	Relative Dry Hiding Power of Paints
ASTM D610	Rusting on Painted Steel Surfaces
ASTM D659	Chalking of Exterior Paints
ASTM D660	Checking of Exterior Paints
ASTM D661	Cracking of Exterior Paints
ASTM D662	Erosion of Exterior Paints
ASTM D711	No-Pick-Up Time of Traffic Paint
ASTM D772	Flaking (Scaling) of Exterior Paints
ASTM D821	Abrasion, Erosion or a Combination of Both in Road Service Tests of Traffic Paints
ASTM D868	Bleeding of Traffic Paint
ASTM D3274	Surface Disfigurement of Paint Films by Fungal Growth or Soil and Dirt Accumulation
ASTM D869	Settling of Traffic Paint
ASTM D870	Water Immersion Test of Organic Coatings on Steel
ASTM D913	Chipping of Traffic Paint
ASTM D714	Blistering of Paints
ASTM D969	Bleeding of Traffic Paint
ASTM D1308	Effect of Household Chemicals on Clear and Pigmented Organic Finishes
ASTM D1309	Settling Properties of Traffic Paint During Storage
ASTM D1360	Fire-Retardancy of Paints (Cabinet Method)
ASTM D1543	Color Permanence of White Architectural Enamels
ASTM D1640	Drying, Curing, or Film Formation of Organic Coatings at Room Temperature
ASTM D1737	Elongation of Attached Organic Coatings with Cylindrical Mandrel Apparatus
ASTM D2197	Adhesion of Organic Coatings
ASTM D2243	Freeze-Thaw Resistance of Latex and Emulsion Paints
ASTM D2248	Detergent Resistance of Organic Finishes
ASTM D2366	Moisture Blister Resistance of Exterior House Paints on Wood
ASTM D2486	Scrub Resistance of Interior Latex Flat Wall Paints
ASTM D2801	Leveling Characteristics of Paints by Draw-Down Method
ASTM D2805	Hiding Power of Paints
ASTM D3273	Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
ASTM D968	Abrasion Resistance of Organic Coatings by the Falling Abrasive Tester
ASTM D3450	Washability Properties of Interior Architectural Coatings
ASTM D3456	Susceptability of Paint Films to Microbiological Attack
ASTM D3623	Antifouling Panels in Shallow Submergence
ASTM D4060	Abrasion Resistance of Organic Coatings by the Taber Abraser
ASTM D4062	Leveling of Paints by Draw-Down Method
ASTM D4213	Wet Abrasion Resistance of Interior Paint by Weight Loss
ASTM D4214	Chalking of Exterior Paint Films
Fed. Std. 141 Method 4494	Sag Test (Multinotch Blade)
Fed. Std. 141 Method 4061	Drying Time

Measurement of Chemical Properties and Compositions

ASTM D34	Chemical Analysis of White Pigments
ASTM D95	Water in Petroleum Products and Bituminous Materials by Distillation
ASTM D521	Chemical Analysis of Zinc Dust (Metallic Zinc Powder)
ASTM D563	Phthalic Anhydride Content of Alkyd Resins and Resin Solutions
ASTM D611	Aniline Point and Mixed Aniline Point of Petroleum Products and Hydrocarbon Solvents
ASTM D1078	Distillation Range of Volatile Organic Liquids
ASTM D1133	Kauri-Butanol Value of Hydro-carbon Solvents
ASTM D1208	Common Properties of Certain Pigments
ASTM D1259	Nonvolatile Content of Resin Solutions
ASTM D1306	Phthalic Anhydride Content of Alkyd Resins and Esters Containing Other Dibasic Acids (Gravimetric)
ASTM D1353	Nonvolatile Matter in Volatile Solvents for Use in Paint, Varnish, Lacquer and Related Products
ASTM D1364	Water in Volatile Solvents (Fischer Reagent Titration Method)
ASTM D1394	Chemical Analysis of White Titanium Pigments
ASTM D1397	Unsaponifiable Matter in Alkyd Resins and Resins Solutions
ASTM D1398	Fatty Acid Content of Alkyd Resins and Alkyd Resin Solutions
ASTM D1399	Unsaponifiable Content of Tricresyl Phosphate
ASTM D1467	Fatty Acids Used in Protective Coatings
ASTM D1469	Total Rosin Acid Content of Coating Vehicles
ASTM D1541	Total Iodine Value of Drying Oils and Their Derivatives
ASTM D1613	Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer and Related Products
ASTM D1639	Acid Value of Organic Coating Materials
ASTM D1644	Nonvolatile Content of Varnishes
ASTM D1652	Epoxy Content of Epoxy Resins
ASTM D2075	Iodine Value of Fatty Amines, Amidoamines, and Diamines
ASTM D2076	Acid Value and Amine Value of Fatty Quaternary Ammonium Chlorides
ASTM D2369	Volatile Content of Paints
ASTM D2371	Pigment Content of Solvent-Type Paints
ASTM D2697	Volume Nonvolatile Matter in Clear or Pigmented Coatings
ASTM D2698	Pigment Content Of Solvent-Type Paints by High-Speed Centrifuging
ASTM D2832	Nonvolatile Content of Paint and Paint Materials
ASTM D3009	Composition of Turpentine by Gas Chromatography
ASTM D3271	Direct Injection of Solvent-Base Paints into a Gas Chromatograph for Solvent Analysis
ASTM D3272	Vacuum Distillation of Solvents from Solvent-Base Paints for Analysis
ASTM D3335	Low Concentrations of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy
ASTM D3624	Low Concentrations of Mercury in Paint by Atomic Absorption Spectroscopy
ASTM D3718	Low Concentrations of Chromium in Paint by Atomic Absorption Spectroscopy

ASTM D3723	Pigment Content of Water-Emulsion Paints by Low-Temperature Ashing
ASTM D3792	Water Content of Waterborne Paints by Direct Injection into a Gas Chromatograph
ASTM D3960	Volatile Organic Contents (VOC) of Paints and Related Coatings
ASTM D4017	Water in Paints and Paint Materials by Karl Fischer Method

Test Sample Conditioning and Preparation

ASTM B117	Salt Spray (Fog) Testing
ASTM D609	Preparation of Steel Panels for Testing Paints, Varnish, Lacquer, and Related Products
ASTM D822	Operating Light-and-Water-Exposure Apparatus (Carbon-Arc Type) for Testing Paint, Varnish, Lacquer, and Related Products
ASTM D823	Producing Films of Uniform Thickness of Paint, Varnish, Lacquer, and Related Products on Test Panels
ASTM D1106	Exterior Exposure Tests of Paints on Wood
ASTM D1014	Exterior Exposure Tests of Paints on Steel
ASTM D1654	Painted or Coated Specimens Subjected to Corrosive Environments
ASTM D1730	Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting
ASTM D1734	Making and Preparing Concrete and Masonry Panels for Testing Paint Finishes
ASTM D2247	Coated Metal Specimens at 110% Relative Humidity
ASTM D2372	Separation of Vehicle Solvent-Type Paints
ASTM D3361	Operating Light-and-Water-Exposure Apparatus (Unfiltered Carbon-Arc Type) for Testing Paint, Varnish, Lacquer, and Related Products Using the Dew Cycle
ASTM D3924	Standard Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials
ASTM G23	Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials
ASTM G26	Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials
ASTM G53	Operating Light- and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials

Paper and Related Products

Paper and Paperboard

TAPPI T208-OS	Moisture in Wood, Pulp, Paper and Paperboard by Toluene Distillation
TAPPI T402-OM ASTM D685	Standard Conditioning and Testing Atmospheres for Paper, Board, Pulp Handsheets and Related Products
TAPPI T403-OS ASTM D774	Bursting Strength of Paper
TAPPI T404-OM ASTM D828	Tensile Breaking Strength and Elongation of Paper and Paper-board (Using Pendulum-Type Tester)
TAPPI T410-OM	Grammage of Paper and Paper-board (Weight per Unit Area)
TAPPI T411-OM	Thickness (Caliper) of Paper and Paperboard
TAPPI T412-OM ASTM D644	Moisture in Paper and Paperboard
TAPPI T414-OM ASTM D689	Internal Tearing Resistance of Paper
TAPPI T425-OM	Opacity of Paper (15 /Diffuse Illuminant A, 89% Reflectance Backing and Paper Backing)
TAPPI T435-OM	Hydrogen Ion Concentration (pH) of Paper Extracts -(Hot Extraction Method)
TAPPI T452-OM	Brightness of Pulp, Paper and Paperboard (Directional Reflectance at 457 nm)
TAPPI T459-OM ASTM D2482	Surface Strength of Paper (Wax Pick Test)
TAPPI T460-OM ASTM D726	Air Resistance of Paper
TAPPI T480-OM	Edge Tearing Resistance of Paper (Finch Method)
TAPPI T480-OS	Specular Gloss of Paper and Paperboard at 75 Degrees
TAPPI T489-OS	Stiffness of Paperboard
TAPPI T494-OM	Tensile Breaking Properties of Paper and Paperboard (Using Constant Rate of Elongation Apparatus)
TAPPI T511-OM ASTM D2176	Folding Endurance of Paper (MIT Tester)
TAPPI T538-PM	Sheffield Smoothness of Paper and Paperboard (air Flow Method)
TAPPI T809-OM	Flat Crush of Corrugating Medium (CMT Test)
TAPPI T818-OM ASTM D1164	Ring Crush of Paperboard

Paper Specifications

ASTM D3208 para. 11	Manifold Papers for Permanent Records
ASTM D3290 para. 11.2	Bond and Ledger Papers for Permanent Records

Pressure Sensitive Tapes

ASTM D3330, D3330M	Test for Peel Adhesion of Pressure-Sensitive Tape at 180-deg Angle
ASTM D3652	Test for Thickness of Pressure-Sensitive and Gummed Tapes
ASTM D3654, D3654M	Test for Holding Power of Pressure-Sensitive Tapes
ASTM D3662	Test for Bursting Strength of Pressure-Sensitive Tapes
ASTM D3759	Test for Tensile Strength and Elongation of Pressure-Sensitive Tapes
ASTM D3811	Test for Unwind Force of Pressure-Sensitive Tapes
ASTM D3815	Practice for Accelerated Aging of Pressure-Sensitive Tapes by Carbon-Arc Exposure Apparatus

Packaging

ASTM D642	Compression Test for Shipping Containers
ASTM D895	Test for Water Vapor Permeability of Packages
ASTM D1108	Tests for Water Vapor Transmission of Shipping Containers

Federal Test Method Standard 101C for Preservation, Packaging, and Packaging Materials:

Method 4035	Water Absorption by Cushioning Materials
Method 4047	Accelerated Aging of Pressure-Sensitive Packaging Tapes (Heat and Humidity; or Heat Only)
Method 5001	Assembly and Disassembly Test of Containers of Complete Packs
Method 5005.1	Cornerwise Drop (Rotational) Test
Method 5007.1	Drop Test (Free Fall)
Method 5008.1	Edgewise Drop (Rotational) Test
Method 5009.2	Leaks in Containers
Method 5011.1	Mechanical Handling Test
Method 5012	Pendulum-Impact Test
Method 5013	Revolving Hexagonal Drum Test
Method 5014	Rollover Test
Method 5015	Shipping Test
Method 5016.1	Superimposed Load Test (Stackability with Dunnage)
Method 5017	Superimposed Load Test (Uniformally Distributed, without Dunnage)
Method 5018	Tipover Test
Method 5019.1	Vibration (Repetitive Shock) Test
Method 5020.1	Vibration (Sinusoidal Motion) Test
Method 5023	Incline-Impact Test
Method 5026	Penetration of Packaging Materials by Water
TAPPI T688OM	Total Wax Content of Corrugated Paperboard
TAPPI T802OS	Drop Test for Fiberboard Shipping Containers
TAPPI T803OM	Puncture and Stiffness Test of Container Board
TAPPI Useful Method 807	Wet Shear Adhesion Test of Corrugated Fiberboard (MBR)

TAPPI T808OS	Flat Crush Test of Corrugated Board
TAPPI T810OM	Bursting Strength of Corrugated and Solid Fiberboard
TAPPI T811OS	Edgewise Compressive Strength of Corrugated Fiberboard (Short Column Test)
TAPPI T821PM	Pin Adhesion of Corrguated Board by Selective Separation

MATTRESSES

16 CFR Part 1632 Sec. 1632.4	Flammability of Mattresses; Test Procedure
MIL-R-0020092J(SH) Sec. 4.4	Rubber Sheets and Assembled and Molded Shapes, Cellular, Synthetic Open Cell (Foamed Latex); Test Methods
MIL-M-18251F Sec. 4.5.1	Mattresses and Mattress Ticks; Test Methods
CCC- C-436D Sec. 4.4	Cloth, Ticking Twill, Cotton; Test Methods
V-M-96H Sec. 4.4.1.1 & Sec. 4.5	Mattress, Bed, Innerspring; Test Methods
AH&MA/NABM	Cornell Testing Procedure for Support Firmness (ANCOR tester)

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5. AUTHOR(S)

Wiley A. Hall, Jr., Robert L. Gladhill, Jeffrey Horlick, Harvey W. Berger

6. PERFORMING ORGANIZATION (If joint or other than NBS, see instructions)

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~~WASHINGTON, DC 20234~~
Gaithersburg, MD 20899

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8. Type of Report & Period Covered

9. SPONSORING ORGANIZATION NAME AND COMPLETE ADDRESS (Street, City, State, ZIP)

10. SUPPLEMENTARY NOTES

☐ Document describes a computer program; SF-185, FIPS Software Summary, is attached.

11. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here)

This document explains the operation and technical requirements of the Laboratory Accreditation Program (LAP) for Commercial Products (Commercial LAP). All of the steps leading to accreditation are discussed. Technical requirements are explained indicating how the NVLAP criteria are applied.

It is intended for use by staff of accredited laboratories, those seeking accreditation, other laboratory accreditation systems, and others needing information on the requirements for NVLAP accreditation under this LAP.

12. KEY WORDS (Six to twelve entries; alphabetical order; capitalize only proper names; and separate key words by semicolons)

accreditation; assessment; laboratory; mattresses; paint; paper; proficiency testing

13. AVAILABILITY

☒ Unlimited
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