

An introduction to the National Voluntary Laboratory Accreditation Program

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The National Voluntary Laboratory Accreditation Program (NVLAP)

- A process for accreditation of testing and calibration laboratories
- Established in 1976
- Procedures set out in the U.S. Code of Federal Regulations (Part 285, Title 15)
- Linked to NIST measurement research
- Based on ISO/IEC standards
- Available to any qualifying laboratory

The National Voluntary Laboratory Accreditation Program (NVLAP) Mission Statement

- To deliver high quality, value-driven accreditation services to testing and calibration laboratories by:
 - meeting or exceeding customer expectations;
 - operating to globally accepted requirements for accreditation bodies;
 - promoting world-wide acceptance of test and calibration results of NVLAP-accredited laboratories; and
 - pursuing organizational and technical excellence.

Fields of Accreditation

Calibration Laboratories

- Dimensional
- Electromagnetics - DC/Low Frequency
- Electromagnetics - RF/Microwave
- Ionizing Radiation
- Mechanical
- Optical Radiation
- Thermodynamics
- Time and Frequency

Chemical Calibration

- Certifiers of Spectrophotometric NTRMs

**Electromagnetic Compatibility
and Telecommunications**

- Emissions, Immunity, MIL-STD-462,
Safety, and Telecommunications

Environmental

- Asbestos Fiber Analysis (PLM Test Method)
- Asbestos Fiber Analysis (TEM Test Method)

Fasteners and Metals**Homeland Security Applications**

- Personal Body Armor
- Radiation Detection Instruments

Information Technology Security Testing

- Common Criteria Testing
- Cryptographic Module Testing

Ionizing Radiation Dosimetry**Product Testing**

- Acoustical Testing Services
- Carpet and Carpet Cushion
- Commercial Products Testing
- Construction Materials Testing
- Efficiency of Electric Motors
- Energy Efficient Lighting Products
- Thermal Insulation
- Wood Based Products

Voting System Testing

NVLAP programs support several federal agency programs

- U.S. Department of Energy (DOE) and the Environmental Protection Agency's (EPA) Energy Star Program;
- DOE's Nuclear Weapons Program; the Nuclear Regulatory Commission (NRC) programs for commercial grade calibration services and testing of personnel dosimetry performance;
- National Information Assurance Partnership (NIAP), a partnership between NIST and the National Security Agency (NSA), for testing encryption/decryption products that ensure information security;
- Federal Communications Commission's (FCC) implementation of Part 15 requirements and its designation responsibilities in support of various Mutual Recognition Arrangements covering telecommunications and electromagnetic compatibility testing;
- Department of the Navy (DON) for electromagnetic compatibility testing; and
- Department of Housing and Urban Development (HUD) for testing of wood based products and carpet and carpet cushions

NVLAP also operates two programs mandated by Congress

Asbestos Hazard Emergency Response Act (AHERA) for testing for asbestos in public schools; and the

Help America Vote Act for the testing of voting machines

The National Voluntary Laboratory Accreditation Program (NVLAP)

- Fee supported program
- Accreditation offered in 16 fields of testing; 8 fields of calibration, covering 90 parameters.
- Our labs are located in North America and Asia Pacific
- Nearly 800 testing and calibration laboratories
 - Laboratory accreditation is renewed annually
 - On-site assessment is performed every other year

Reasons Labs Become Accredited

- Improved Laboratory Operations
- Reduction Of Second Party Audits
- International Acceptance Of Calibrations And Measurement data

LABORATORY ACCREDITATION

- ❑ Independent, third party evaluation of a laboratory's technical competence.
 - ❑ Evaluation is based on a Standard
 - ❑ Evaluation of specific scope of accreditation
 - ❑ Evaluation by peer technical experts
 - ❑ Results in formal recognition

What is NVLAP?

■ NVLAP is:

- A system for accrediting laboratories found competent to perform specific tests or calibrations or types of tests or calibrations

■ NVLAP is not:

- A certifier of test data
- A certifier of products
- An operator of a certification program

Assessment - Considerations

■ TYPES

- Scheduled Visits
- Monitoring Visits

■ ASSESSORS

- Peer experts; technically experienced with years of experience in their field; trained in quality systems and assessment techniques by NVLAP
- Paid by assignment; based on renewal fees

■ TOOLS

- The Standard, i.e., ISO 17025
- Specific technical requirements, standard methods
- Checklists (general and tailored)

Basis for Accreditation

- Documented Quality system
 - Quality Manual
 - Quality Procedures
 - Instructions (Test methods, calibration procedures)
 - Records (Equipment maintenance, personnel training, complaints, etc.)

Basis for Accreditation (Cont.)

- On-site assessment
 - Environmental conditions
 - Test and measurement equipment
 - Calibration program
 - Trained personnel
 - Uncertainty budgets
 - Traceability
 - Validation of quality system

Basis for Accreditation (Cont.)

- Proficiency testing
 - Acceptable characterization of test sample
 - Acceptable value for a calibration artifact
 - Weights, gage blocks, resistors, load cells, etc.
 - Pass/fail criteria
 - comparison with group mean (test lab)
 - Normalized error ratio, E_n (cal lab)
 - Used as data point to aid in decision whether or not to accredit

Other Factors

- Review of test methods or calibration procedures by technical experts
 - Validity of technical approach
 - Uncertainty analysis
 - Traceability to national standards
- International Laboratory Comparisons (ILCs) conducted with accredited labs in other countries

Accreditation Decision

- Based on results obtained during each step of the process
 - Documentation review
 - On-site assessment
 - Proficiency testing
 - ILCs
- Results reviewed by independent subject matter experts

NIST Handbook 150

■ NVLAP General Procedures and Requirements

- ▣ General Information

- ▣ Accrediting a Laboratory

- ▣ Conditions and Criteria for Accreditation

- ▣ Sections 4 and 5 contain the managerial and technical requirements of ISO/IEC 17025:2005

Accreditation of interest to CORM

Recommendations in the CORM 5th Report led to the establishment of the Calibration Laboratory Accreditation Program (LAP) in the area of optical radiation measurements in NVLAP

NIST Handbook 150, 'NVLAP Procedures and General Requirements.' NIST Handbook 150-2E, 'Calibration Laboratories Technical Guide for Optical Radiation Measurements,' was developed to assist laboratories in achieving accreditation by providing guidelines for good calibration laboratory practices.

Accreditation of interest to CORM

Chemical Calibration: Certifiers of Spectrophotometric NTRMs

NVLAP offers accreditation to Certifiers of Spectrophotometric Filter NIST Traceable Reference Materials (NTRMs) under the Chemical Calibration field of the Calibration Laboratories Accreditation Program.

An NTRM is a commercially produced reference material with a well-defined traceability linkage to existing NIST chemical measurement standards. Initially, accreditation is offered to certifiers of filters used for the measurement of light absorption in the visible spectrum.

Laboratories that have received NVLAP accreditation are permitted to distribute, with the NIST trademark designation NTRM (TM), filter reference materials that they have designed, prepared, characterized, and certified, and that meet all the technical specifications and other requirements set forth.

Technical requirements are contained in NIST Special Publication SP 260-140: Technical Specifications for Certification of Spectrophotometric NTRMs.



Accreditation of interest to CORM

Energy Efficient Lighting Products

The NVLAP Program for Energy Efficient Lighting (EEL) Products provides for laboratory accreditation as follows:

(a) Testing the Electrical, Photometric, Colorimetric, and Life-Performance Characteristics of Incandescent, Fluorescent and High Intensity Discharge Lamps; and

(b) Testing the Photometric Characteristics of Luminaries (Lighting Fixtures).

The scope of the EEL program covers the Illuminating Engineering Society (IES) and American National Standards Institute (ANSI) test methods listed in the Test Method Selection List found in NIST Handbook 150-1.

International Recognition

- International Laboratory Accreditation Cooperation (ILAC)
 - Global Mutual Recognition Arrangement (MRA) among accreditation bodies
 - Based on evaluation of competence
 - 47 signatories from 38 economies
- Asia Pacific Laboratory Accreditation Cooperation (APLAC)
 - 27 signatories from 15 economies
 - Membership roughly parallel to APEC
 - Designated as Specialist Regional Body by APEC

Thanks for your attention

- Additional information
 - <http://www.nist.gov/nvlap>
 - NIST Handbook 150
 - NVLAP newsletter
 - Handouts on laboratory accreditation