federal register

THURSDAY, JANUARY 18, 1979
PART III

DEPARTMENT OF COMMERCE

Office of the Secretary

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NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM

Test Thermal Insulation Materials; General and Specific Criteria, and Fees and Charges

[3510-13-M]

DEPARTMENT OF COMMERCE

Office of the Secretary

NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM

Final General and Specific Criteria for Accrediting Laboratories That Test Thermal Insulation Materials

AGENCY: Assistant Secretary of Commerce for Science and Technology.

ACTION: Announcing the final general and specific criteria that laboratories which test thermal insulation materials must meet in order to be accredited under the provisions of the National Voluntary Laboratory Accreditation Program.

SUMMARY: Pursuant to the Procedures for a National Voluntary Laboratory Accreditation Program (NVLAP) (15 CFR Part 7), this notice contains the text of the final general and specific criteria to be used by the Secretary of Commerce (Secretary) in accrediting testing laboratories that voluntarily request such accreditation under the National Voluntary Laboratory Accreditation Program for Thermal Insulation Materials (NVLAP-1). These final criteria are based upon criteria proposed in the FEDERAL REGISTER on September 29, 1978 (43 FR 45290-45297), and include modifications to the proposed criteria in response to comment from the public. The evaluation of these public comments and the recommendations of the National Laboratory Accreditation Criteria Committee for Thermal Insulation Materials (NLACC-1) submitted to the Assistant Secretary of Commerce for Science and technology on December 18, 1978, provided valuable guidance in arriving at the final criteria.

These final criteria do not differ from the proposed criteria in any significant way. The Notes following Criteria G1 and S1 were modified so as to make it clear that the on-site examiner, upon visiting a laboratory, may compare resumes of key persons with resumes and job descriptions provided by the testing laboratory in response to the requirements of sections G1.1.6 and S1.1 of criteria. The purpose of this comparison will be to assure that the laboratory is staffed with personnel competent in the principles and practices of measurement in the area in which accreditation is sought. Section G2.1.4 was changed to make it clear that the laboratory is expected to have a procedure to respond to complaints about test results. Although these procedures may vary among the various accredited laboratories, NVLAP will establish its own uniform procedures to respond to complaints which it receives about accredited laboratories. The note following section 4 of Criterion S4 was also expended to make it clear that a laboratory accredited for a specific test method must also be accredited for all other test methods in the NVLAP program which are used to obtain data necessary to complete the specific test method.

In addition to these modifications of the criteria proposed on September 29, 1978, several paragraphs have been added at the beginning of the criteria which contain instructions for making application for accreditation and describe the conditions related to examination of the laboratory, fees to be paid by the laboratory, and limits on the laboratory in publicizing the laboratory's NVLAP accreditation as specified in section 7.7(c) of the NVLAP procedures (15 CFR Part 7). Several paragraphs have also been added at the end of criteria in order to clearly identify the requirements applicable to proficiency sample testing.

Finally, Appendix 1 of the proposed criteria was clarified and amplified. Several test methods, dealing primarily with tests for cellulose insulation, were added to the program. The data presented in Appendix 1 are supplemental to the criteria, clarifying the application of the criteria to thermal insulation materials. As such, they are part of the operating process of the program and not part of the criteria. As this NVLAP program is implemented, it may be necessary to change some of the stated values for precision and accuracy of each test method, modify proficiency sampling programs, or to make other adjustments to the material in Appendix 1 in response to changes in the state-of-the-art. When such changes are developed they will be published in the FEDERAL REGISTER and made effective immediately upon publication.

DATES: These final criteria shall go into effect on (please insert the date which is 30 days from the date this notice will appear). Laboratories which complete their application for accreditation and submit their fee by February 28, 1979 will be included among the first group of laboratories to be evaluated for accreditation under NVLAP procedures. Applications received after this date will be included in a second group of laboratories to be evaluated six months to one year later.

FOR FURTHER INFORMATION CONTACT:

Dr. Howard I. Forman, Deputy Assistant Secretary for Product Standards. Room 3876, U.S. Department of Commerce, Washington, DC 20230; (202) 377-3221.

SUPPLEMENTARY INFORMATION: On September 29, 1978, the Department of Commerce (Department) announced in the FEDERAL REGISTER (43 FR 45290-45297) the issuance of proposed criteria for accrediting testing laboratories that test thermal insulation materials. On the same day in a separate FEDERAL REGISTER notice (43 FR 45298) the Department issued the proposed schedule of estimated fees that laboratories would be charged if they want to become accredited. Information on fees was provided to enable a laboratory to more completely evaluate the proposed criteria.

Persons desiring to comment on the proposed criteria were invited to submit their comments to the Assistant Secretary for Science and Technology on or before November 13, 1978. Fourteen respondents submitted written statements during the comment period. Their statements are part of the public record and are available for inspection and copying in the Department's Central Reference and Records Inspection Facility, Room 5317, Main Commerce Building, 14th Street between Constitution Avenue and E Street, N.W., Washington, DC 20230.

Persons desiring to present views at an informal hearing on the proposed criteria were invited to request such hearings. No such requests were received and, accordingly, no hearings were held.

The issues raised by the public comment in response to the notice of proposed criteria were addressed by the NLACC-1 in an open meeting on December 8, 1978. The Committee's report entitled "Report of Evaluation and Recommendations with Respect to Comments Received from the Public on the Proposed Criteria for Accrediting Testing Laboratories that Test Thermal Insulation Materials" was presented to the Assistant Secretary for Science and Technology on December 18, 1978 and is available for inspection and copying in the Departmental Central Reference and Records Inspection Facility mentioned above.

EVALUATION OF COMMENTS

A total of 14 issues were raised in response to the criteria as proposed. Eight issues relate directly to the criteria for accrediting laboratories. The six other issues relate to the operating process of NVLAP, including the content of Appendix 1 of the proposal which is not part of the criteria. The criteria and Appendix 1 have been revised to respond to a number of the comments. Further revisions to Appendix 1 may be necessary as the program is implemented. When such revisions are developed, they will be published in FEDERAL REGISTER and made

effective immediately upon publication.

ISSUES RELATED TO THE CRITERIA

1. Should the names and resumes of laboratory personnel be required in evaluating a laboratory's capability? Two respondents agreed with the criteria as proposed in that names and resumes of key laboratory personnel need not be provided, while three other respondents expressed the belief that such a requirement is appropriate if restricted to a limited number of personnel. This issue remains controversial. Some of the Committee members expressed concern that if names and resumes are required, individuals could be "black listed", while others were concerned that, without resumes, the personnel function cannot be effectively evaluated pursuant to Criterion S1. Criteria and examination methodology from six existing laboratory accreditation programs were reviewed. In most of these, the submission of resumes describing the technical background, expertise, and competence of the laboratory staff is required. However, without criterial which specify minimum levels of educational attainment, professional recognition (e.g. "professional engineer"), and a requisite number of years of working experience, the evaluation of a laboratory's staff would be subjective. In response to the recommendations of the Criteria Committee, Criteria G1 and S1 continue to state that either resumes or position descriptions may be supplied to meet this requirement. Moreover, the notes following Criteria G1 and S1 make clear that during on-site evaluation, personnel backgrounds of incumbent laboratory personnel will be compared to corresponding position descriptions or resumes supplied by the laboratories in response to the questionnaire. Also Appendix 2 has been added as a guide showing the type of information which a laboratory should supply in resumes or position descriptions.

2. May unaccredited laboratories be used by accredited laboratories as subcontractors? Two respondents indicated that the possible use of subcontractors by accredited laboratories for the performance of test methods included in the program was unclear. Using test methods in the NVLAP program as examples, one respondent described how a laboratory accredited for a second test method might use as input data to this second test method data provided by a subcontractor using a first test method. At issue is whether NVLAP accredited testing laboratories would have to be used as a subcontractor or whether unaccredited laboratories could be used. In such a situation, the Committee recommended that the laboratory accredited for the second test method should also be accredited for all other test methods used to obtain input data.

The Committee further suggested that if an accredited laboratory obtains data from an unaccredited laboratory for a test method that was included in the program, the accredited laboratory's client should be so notified. It was recognized that problems associated with the repeated testing of products are related more to a certification of the product than to NVLAP recognition of a laboratory through accreditation. Thus, it was recommended that an accredited laboratory should be allowed to subcontract to an unaccredited laboratory any tests for which the former laboratory itself is accredited, provided its clients were so notified. However, subcontracting for test specimen preparation and for determining intermediate values (except where such intermediate values are obtained from a test method included in the NVLAP program) should not require notification of the laboratory's clients if there is compliance with provisions of section S4.2 of the criteria.

The note after section S4.2 of the Criteria has been changed in response to the Committee's recommendations.

3. Should only independent laboratories be included in NVLAP? Three respondents addressed the independence of laboratories and the related conflict of interest issue. One respondent felt that only commercial independent laboratories should be accredited. Another respondent suggested that sections G3.3 and G3.4 of the criteria should be strengthened to minimize possible conflict of interest and to provide a means of validating that independent actions are actually made. However, another respondent expressed the belief that sections G3.3 and G3.4 are fair to both independent and in-house laboratories and therefore should remain unchanged.

Section 7.7(e)(1) of the NVLAP procedures explicitly states that, "No action will be taken or criteria developed that would prohibit the accreditation of a testing laboratory solely on the basis of that laboratory's association or nonassociation with manufacturing, distributing, or vending organizations . . ." The criteria as proposed are consistent with the above quoted prohibition. Moreover, if the actions of an accredited laboratory are not in accord with the submitted evidence of the "independent decisional relationship" requirements of sections G3.3 and G3.4 of the criteria, appropriate action including deaccreditation may be taken. The Committee's recommendation against changing sections G3.3 and G3.4 has been accepted.

4. How will proficiency testing be used in the program? One respondent indicated that the frequency of proficiency testing is not clear in the proposed criteria and suggested that such testing be carried out at least yearly. This respondent added that the proposed criteria do not establish a relationship between proficiency testing and the establishment of protocols for assuring that the requisite precision and accuracy figures cited in Appendix 1 are achieved. Also, this respondent expressed the belief that guidelines and requirements concerned with the conduct of these proficiency tests must be included in the final criteria document. A better description of the operation of the proficiency testing program is indeed needed.

In response to the recommendations of the Committee, this issue has been addressed in the criteria under a separate heading and a new table (Table 2) has been added to Appendix 1 showing those test methods currently subject to proficiency testing and the frequency of such tests. It is the intent of the National Bureau of Standards (NBS) which is responsible for evaluating the testing laboratories to use Collaborative Testing Services, Inc. (CTS), a nonprofit organization currently cosponsoring collaborative reference programs with NBS, to conduct the proficiency testing programs. Enrollment in the NBS-CTS Collaborative Reference Program for the test methods shown in Table 1 of Appendix 1 and the successful attainment of the precision and accuracy shown will be accepted as fulfilling the proficiency testing requirements of NVLAP-1. This does not preclude the use of other collaborative reference programs or existing proficiency testing programs for the test methods involved if appropriate arrangements can be completed with NBS. The Committee also raised a question with regard to materials used in conducting corrosion tests. For example, metal coupons (strips) employed for evaluating corrosion require removal of protective coatings before use. However, if such a coating is not removed properly, inaccurate results may be obtained. It was suggested that, if proficiency tests are planned, chemical coating removers should be supplied with the metal coupons and the proficiency sample insulation materials. NBS will give careful consideration to this operational recommendation as the state-of-the-art develops.

5. Should modifications to the test methods be allowed? Two respondents commented on the provisions of the proposed criteria allowing for noncritical modifications of equipment or facilities and noncritical varitions in the test procedures as long as test result are not degraded. One respondent suggested that judgments regarding whether such modifications and variations are "noncritical" should be

relegated to the responsible standards development groups. The other respondent suggested that a section be added to Criterion S2 encouraging participation in professional societies and continuing education as ways of maintaining current knowledge thereby maintaining capability to make appropriate judgments. The Committee discussed this subject in depth in one of its earlier meetings and had concluded that, although in some instances it may be very difficult to determine what is noncritical, knowledgeable NVLAP on-site evaluators and proficiency testing should be adequate to evaluate these modifications. There appears to be no need to specify particular requirements, such as continuing education or society participation, for maintaining required competence. Accordingly, the Committee's recommendation that no change be made to the criteria has been accepted.

The Department believes it is appropriate at this point to stress, that under § 7.7(e)(5) of the NVLAP procedures, any written information supplied in response to these criteria and Criterion S2 in particular will not be considered confidential business data, trade secrets, or proprietary information.

6. Are the requirements for written information too extensive? Two respondents addressed the requirements for written information. One respondent stated that there appears to be excessive written compliance information which is either repetitious or only remotely related to a laboratory's competence. The other respondent suggested that NVLAP examiners, during on-site examinations, should concentrate on the actions taken by the laboratory to implement that procedure and to provide the written information, and should observe actual calibration tests on selected test equipment.

There may very well be some unnecessary overlap in the criteria. However, different characteristics of the laboratory are being assessed and the evaluation is being approached from different standpoints. Nonetheless, as explained in the notice of the proposed criteria, duplication of information is not required; a simple cross reference would be sufficient. Change in the criteria may be appropriate after experience has been gained. NVLAP examiners are expected to use all appropriate means to verify that the laboratories implement test procedures properly and prepare appropriate written information. The Committee's recommendation that no change is deemed necessary at this time has been accepted.

7. Should uniform appeal procedures be established? One respondent sugested that there should be a unified complaint handling procedure to be established by NBS for contesting test results. Criterion G2.5.6 refers to the complaint handling procedures established by the laboratory to respond to complaints it receives. Any complaints made to NBS and the Department relative to a laboratory will be handled under a single unified procedure. It does not appear to be necessary to require each laboratory to handle complaints to it in the same way. In response to the Committee's recommendation, the Note at the end of Criterion G2 has been modified to clarify the intent of the criterion.

8. Should the time within which it is necessary to notify NVLAP of changes in the laboratory be increased? One respondent expressed the belief that the costs for reporting of changes will be excessive if a 30-day notification period and a 45-day implementation period is adopted as specified in Criterion G4. This respondent recommended a 120-day notification period and a 180-day implementation period. A delay of 120 days before notification of changes was excessive in the view of the Committee. In response to the Committee's recommendations, deadlines for reporting and implementing changes remain as specified in the proposed criteria.

ISSUES RELATED TO THE PROGRAM OPERATIONS (INCLUDING APPENDIX 1)

9. Should additional test methods be included in this laboratory accreditation program? A number of respondents expressed concerns about the apparent omission from the program of test methods contained in certain product standards (e.g., test methods in product standard ASTM C739, General Services Administration Specification (GSA) HH-I-515, and cellulose insulation standards published by the Consumer Product Safety Commission (CPSC)). Several other test methods were also suggested for inclusion in NVLAP-1.

The requestor of this program identified specific product standards and test methods covering the following five properties of thermal insulation materials:

1. Thermal properties;
2. Dimensions, stability and density properties;
3. Strength properties;
4. Fire properties; and
5. Properties of vapor barriers.

The requestor did not identify tests in the areas of corrosiveness and odor emission contained in C739. Standard ASTM C739 was included as a relevant standard, however, in the final finding of need for the program as published on October 12, 1977 (42 FR 55020-55024). The following ASTM standard test methods listed in that standard are included in NVLAP-1: C177, C518, C236, C687, C519, C591, and E84.

There are a number of test methods contained integrally in ASTM C739 and several other product standards which do not have an independent ASTM test method designation. During the second NLACC-1 meeting, it was reported that if all test methods contained in the specification standards but not identified as specific ASTM test methods were included in the program, some 80 additional test methods would be added to the program. NVLAP staff indicated that it intended to include in the program only the test methods which were explicitly requested.

In the comments received from the public, it was clearly pointed out that the test methods identified in ASTM C739 should be included in the program because of their use in mandatory standards being promulgated by the Consumer Product Safety Commission (CPSC). The Committee agreed that it was desirable to include test methods from ASTM C739 in the program. Specifically, this would mean that four test methods should be added to the program; (1) flame resistance; (2) corrosion; (3) moisture absorption; and (4) odor emission. The Committee, however, questioned the inclusion of the test method on odor because of the nature of that test.

The Committee also agreed that it was desirable to add test methods which are an integral part of the GSA specification HH-I-515 but which do not have a unique identification. Using the program provision that only the latest version of the standards and test methods would be included in NVLAP, the test methods in HH-I-515D which should be added to the program are for: (1) settled density; (2) smoldering combustion; (3) corrosion; (4) moisture absorption; (5) odor emission; (6) starch; and (7) fungus.

The tests for corrosion and moisture absorption in ASTM 739 and HH-I-515D are not identical and each would be added to the program. However, the Committee took cognizance of the difficulty in conducting the odor emission test according to the ASTM 739 procedures and the qualitative nature of both odor emission tests and recommended that the odor emission tests not be included in the NVLAP-1 at this time.

Some respondents also suggested that additional test methods contained in the CPSC standards be included in the program. These standards are based upon HH-I-515 although there are significant differences. Since a request to include CPSC standards was never a part of the final finding of need for this program, a formal request to include the CPSC standards should be made and in response to

such request an extension to the finding of need would have to be made using the NVLAP procedures. However, it may be more practical for the CPSC to request that its standards be included using the optional NVLAP procedures (15 CFR Part 7B proposed on October 25, 1978, 43 FR 49812-49818) if and when these procedures become final.

The CPSC staff, in a comment on the proposed criteria, has requested that four test methods of interest to the CPSC be added to the program. The Committee suggested adding these methods to the program if at all possible when the final NVLAP criteria are published. The Department is concerned, however, about differences between some of the test methods as they appear in the iterim CPSC regulations and the proposed final CPSC regulations. For this reason, the Department believes that the most appropriate way to include CPSC requirements in the NVLAP Program is to ask the CPSC to clarify its intent with respect to all aspects of their relevant regulations and to make a request to the Department for inclusion of the CPSC requirements under provisions of Part 7B of the NVLAP procedures which are expected to be published in final form early in 1979.

In response to the Committee's recommendations, all test methods of ASTM C739 and of HH-I-515 not already included in the program will be added to the program with the exception of the test for odor emission.

In deciding which test methods were to be included in this program, it was reasoned that standard methods which were not referenced in the thermal insulation material specifications (standards) included in the final finding of need for the program would not be included in the program. For this reason, ASTM test method D1623 which the requestor originally identified was not included in the program. The final finding of need did not specifically address those test methods contained in the standards which do not have unique designations. In response to the recommendations of the Committee, ASTM D1623, D732, and E408 which a respondent suggested should be included will not be included in the program. ASTM test method D1622 is included in the program. (Unfortunately, due to a typographical error, this test method was shown incorrectly as 01/D18-ASTM D162 in the proposed criteria.)

At the suggestion of the Committee, an index has been added as Appendix 3 which identifies the formal designation and title of those test methods and recommended practices for which accreditation can be granted under NVLAP-1.

10. What should be the frequency of on-site examinations under the program? Three of four respondents who commented on this question indicated that two-year intervals plus or minus three months was adequate. However, the other respondent suggested that inspections should occur every 12 months. Concern for the magnitude of fees in relation to the frequency of on-site examination was given as one reason why a two-year interval would be more appropriate since the cost of the program for the laboratories will depend upon the frequency of on-site examinations. If the fees and charges become too great, few laboratories will apply and accordingly there would be a possibility that there will be no program. Less frequent examinations may result in a reduction in credibility of the program although the magnitude of any such reduction is unpredictable. More frequent examination would provide a check to ensure that the latest versions of the test methods are being used. In the proposed fee structure which was published in the FEDERAL REGISTER notice on September 29, 1978 (43 FR 45298), it was assumed that a "typical" laboratory involved in the program would request to be accredited for nine test methods at a cost of $1,225 per year if examined every two years (including the costs of the proficiency tests). The costs of unannounced visits to one-third of the laboratories in the program was estimated to be six percent of the cost. If the on-site examination were performed every year and unannounced visits were eliminated, the fees would almost double if it were necessary to complete all elements of the evaluation. In actual practice, some additional costs could be saved since a complete evaluation (evaluation of all the data about the laboratories) would not have to be done every year. In response to the recommendations of the Committee, NVLAP will conduct examinations annually for the first two years in which a laboratory is enrolled in the program and biannually thereafter. NVLAP will also retain provisions for random, unannounced visits to accredited laboratories as presently stated in the proposed criteria, particularly for cases where poor proficiency test results suggest a potential problem.

11. Should the stated precision and accuracy of test results be changed? Three respondents expressed concern about the precision and accuracy of test results that are stated in Appendix 1 to the proposed criteria. One respondent suggested deletion of the precision and accuracy requirements and a clarification of the definitions of various terms used in Appendix 1. Another respondent suggested that the accuracy limit for 01/D13-ASTM C519 should be changed to plus or minus five percent rather than the stated plus or minus two percent. The third respondent suggested that Appendix 1 should be revised to convey recommended repair and preventive maintenance cycles for each piece of equipment covered by the test methods because proper repair and maintenance are critical to the production of accurate data. Precision and accuracy values will be particularly important for those test methods where proficiency samples are used. The values suggested in Table 1 are the best available at this stage in the program. Changes to some values may be appropriate as experience is gained in implementating the program. In some instances, the values are specified in the product standards themselves and are not likely to change. Values for precision and accuracy are provided for many of the test methods even though proficiency tests are not being required for these methods. Such values are meant as guides or goals for the laboratory.

With regard to 01/D13-ASTM C519, the target values of plus or minus two percent were intended for classifying "good" laboratories. Limints approximately 50 percent greater (± three percent) define "acceptable" laboratories for this aspect of NVLAP accreditation. It was also pointed out that part of the reason that five percent limits were suggested by the respondent is that the materials tested may not be homogeneous, thereby accountin for part of the deviation. It was recommended that limits of plus or minus two percent for "good" laboratories, based on the use of homogeneous materials, was appropriate. The Committee did not believe that repair and maintenance schedules were necessary for inclusion in the criteria since actual performance of the laboratory was being monitored through periodic proficiency testing and on-site examinations. In response to the Committee's recommendations, the accuracy limit of plus or minus two percent of 01/D13-ASTIM C519 was retained. A clarification of how precision and accuracy requirements will be used is included in the portion of this criteria labeled Proficiency Testing.

12. Which versions of test methods are included in the program? Two repondents suggested that Appendix 1 should contain a clear statement to the effect that the latest versions of the test methods shall be applicable. The Committee agreed and in response to its recommendation, such clarification has been added to Appendix 1.

13. Will full fees and charges be paid by a laboratory participating in successive NVLAP programs? One respondent requested a clarification with respect to the fees and charges. Specifi-

cally, will a laboratory which seeks accreditation for a number of products be required to pay the fixed charge for each product area? The Department believes that charging full fees for each of several programs a laboratory may participate in is not appropriate. As successive NVLAP programs are established, it is the Department's intent to eliminate the duplication of data and to consolidate visits to a laboratory thereby keeping fees to a minimum. It is the policy of NVLAP to accredit laboratories as inexpensively as possible without compromising the effectiveness of the program.

14. Should examiners and evaluators be exclusively government employees? Two respondents commented on issues related to the use of examiners and evaluators. One respondent suggested that the major emphasis of the program should be geared toward on-site peer examination with frequent proficiency testing. The other respondent expressed the belief that examiners and evaluators be full-time government employees in order to insure uniform evaluation. Peer evaluation is a long term goal of the program. When a group of peers is identified and trained so as to ensure consistent evaluation, more emphasis will be placed on this approach. In the interim, the program will use full-time government employees or contract employees who have specific evaluation skills. Although the program will strive for uniform evaluation, it is not necessarily true that using all full-time government employees will ensure such uniformity. NVLAP should be open in the long term to the use of contractor services and other methods of providing on-site examination and evaluation. The Committee recommended that no change in the operating process was necessary at this time, and its recommendation has been accepted.

Laboratory Accreditation Criteria

The final general and specific criteria to be used to accredit laboratories which test thermal insulation materials under the National Voluntary Laboratory Accreditation Program (NVLAP) of the Department of Commerce are contained in the following paragraphs. These criteria have been developed in compliance with the NVLAP procedures (15 CFR Part 7) and form the basis for accrediting testing laboratories which voluntarily request such accreditation.

Instructions for Making Application. Any testing laboratory which desires accreditation as a NVLAP accredited laboratory testing thermal insulation materials using one or more of the test methods in the program may request such accreditation from the Assistant Secretary of Commerce for Science and Technology, Department of Commerce, Washington, DC 20230. Each request will be acknowledged upon receipt, and will be forwarded to the National Bureau of Standards (NBS) for further action. NBS will transmit materials describing the program and an application form which will allow the requesting laboratory to identify the specific test methods for which it desires accreditation. When the requesting laboratory returns the completed application and requisite fees, it becomes an official applicant in the program.

Basic Conditions for Accreditation. In order for a laboratory to be accredited under these NVLAP procedures, it must, among other things, agree to the following basic conditions:

1. It must submit to examination and audit procedures established for the program initially and on a continuing basis;

2. It must pay accreditation fees and charges; and

3. It must avoid reference by itself and forbid others utilizing its services from referencing its accredited status in consumer media and in product advertising or on product labels, containers and packaging or the contents therein.

In addition, the applicant laboratory must recognize that compliance by testing laboratories with these general and specific criteria and accreditation of a laboratory by the Secretary shall in no way relieve such laboratory from the necessity of observing and being in compliance with existing Federal, State and local statutes, ordinances, and regulations that may be applicable to the operation of such laboratory, including consumer protection and anti-trust laws.

This accreditation program consists of three distinct operations. First, the laboratory submits written information in response to a questionnaire based on the requirements of the general and specific criteria. These written responses are evaluated, and if the laboratory is judged to meet the criteria based on these responses, an on-site examination is arranged. The second operation is to conduct an on-site examination of the laboratory with appropriate equipment to compare the observed characteristics of the laboratory with written information submitted by the laboratory and with the criteria. The third operation is to arrange for and obtain data from proficiency tests which are part of the program. An evaluation of the written information, the on-site examiners' assessment, and proficiency testing data all taken together will form the basis for making a decision about whether or not to accredit a specific laboratory.

General Criteria. For initial accreditation and continued accreditation, an applicant laboratory shall provide the information listed below for the general product and testing areas for which accreditation is sought. This information will be formally requested on a questionnaire sent to each applicant testing laboratory upon receipt of that laboratory's application and requisite fees and will be verified by on-site examiners.

A single or double asterisk preceding a section number signifies that the section must be included in quality control procedures as explained in section G2.6.

Criterion G1. *The laboratory has an organizational structure that enables it to develop and maintain a testing capability to perform satisfactorily the functions for which accreditation is sought.*

G1.1 A description of the laboratory's organization including:

*G1.1.1 The complete legal name and address of the main office, or parent company if part of a larger organization;

*G1.1.2 The name and location of the laboratory if different from that stated in G1.1.1;

G1.1.3 A general description of the laboratory, including, its equipment and facilities;

G1.1.4 The laboratory's and parent company's (if any) principal ownership and management structure, including the names and positions of the principal officers and board of directors;

*G1.1.5 An outline or chart showing the titles or positions of all key management and supervisory personnel in each operating, support, and service unit in the laboratory's functional organization, and their reporting relationships relative to this accreditation request;

**G1.1.6 The names and resumes of the individuals assigned to each of the positions identified in G1.1.5 or the personnel requirements for the individuals occupying those positions.

G1.2 A listing of the relevant technical services performed.

*G1.3 A list of test method standards for which accreditation is sought, showing the approximate number of times each test is performed per year.

*See sections 2.6.1 and 2.6.2 for meaning of asterisks.

Note.—This criterion and its sections require a relatively straightforward description of the testing laboratory. An evaluator will review written information supplied by the laboratory in response to this criterion for appropriate definition of authority and responsibility, for the personnel qualifications, and for consistency between services offered and personnel and facilities available. An on-site examiner will verify the responses to the questionnaire regarding the laboratory's facilities and organization, will compare resumes of personnel with personnel requirements submitted by the laboratory, and will conduct other appropriately

related examinations. Appendix 2 is provided as a guide to applicant laboratories for reporting the requirements for management and technical personnel involved in the testing area for which accreditation is sought. The examples given in Appendix 2 are guides to the type of information desired and should not be interpreted as minimum or even typical requirements for personnel in this program.

Criterion G2. *The laboratory has and maintains a quality control system to assure the technical integrity of its work.*

**G2.1 A description of the laboratory's system for auditing and monitoring its test work, including procedures for:

**G2.1.1 Preventing or reducing testing errors and discrepancies;

**G2.1.2 Identifying and correcting known errors and discrepancies;

**G2.1.3 Specifying the frequency and the sample size (quantity) of the audit sampling of the test results of testing personnel.

**G2.1.4 Obtaining tracing the validity of, and responding to complaints and charges received by the laboratory about the quality of its test work.

**G2.2 A description of the laboratory's system for insuring that all test equipment and reference standards are calibrated or verified to the requisite degree of accuracy including procedures for:

**G2.2.1 Maintaining written descriptions of the standardization (calibration and verifications) procedures for all test equipment and reference standards;

**G2.2.2 Maintaining standardization records, including:

(a) Equipment, description or name,

(b) Name of manufacturer,

(c) Model, style, and serial number or other identification,

(d) Equipment variables subject to standardization,

(e) Range of operation and range of standardization,

(f) Resolution of the instrument and allowable error tolerances on readings,

(g) Standardization schedule (intervals),

(h) Date and result of last standardization and date of next standardization,

(i) Name of laboratory person or standardization service providing the above standardization,

(j) Traceability to NBS or other authority as required;

**G2.2.3 Insuring that all test equipment is recalled periodically for verification and/or recalibration.

**G2.3 A description of the laboratory's system for assuring that all equipment and facilities are properly maintained (e.g., routine operational checks and upkeep, maintenance of instructions for equipment operation and repair, power sources, electricity, and gases).

**G2.4 A description of the laboratory's system for controlling the flow of work, including procedures for at least the following:

**G2.4.1 Specifying workflow from reception to reporting;

**G2.4.2 Specifying the functions to be performed at each step along the workflow path;

**G2.4.3 Data recording, processing and reporting;

**G2.4.4 Selecting specimens for testing;

**G2.4.5 Retention or disposal of specimens tested.

**G2.5 A description of the laboratory's system for maintaining records, including records of:

**G2.5.1 Test reports;

**G2.5.2 Data generated during testing;

**G2.5.3 Receiving, shipping and disposal of test samples;

**G2.5.5 Personnel (including training);

**G2.5.6 Complaints contesting results.

G2.6 A copy of the laboratory's quality control manual or procedures which should:

G2.6.1 Explicitly include information required by sections of these general specific criteria preceded by a single asterisk (*);

G2.6.2 Clearly state where in the laboratory is maintained the information required by sections of these general and specific criteria preceded by a double asterisk (**), or explicitly include this information.

G2.6.3 Explicitly include the procedures to be followed for maintaining the manual current and the name or title of the person responsible for implementing those procedures.

NOTE.—In assessing a laboratory's capability to meet this criterion, an evaluator, based on information submitted by the laboratory, will be making judgments about the adequacy of the test auditing and monitoring program of the laboratory, the adequacy of the laboratory's calibration system, the appropriateness of the laboratory's equipment and facility maintenance, the laboratory's system for controlling the flow of work, the laboratory's system for maintaining records, and the laboratory's system for responding to complaints. The on-site examiner will verify the information supplied by the laboratory and examine other characteristics as appropriate.

The laboratory's quality control system must be documented by a quality control manual or written procedures. The purpose of the manual is to provide, in one convenient location, detailed descriptions, or clear instructions where such descriptions may be found, of the operating and quality assurance procedures governing the human and physical resources of the laboratory. The manual must be available at all times to serve as a guide for the laboratory staff, and procedures must exist for maintaining and periodically updating it. It is subject to review during on-site laboratory examinations by NVLAP personnel. An example of how such a manual might be structured is presented in the American Council of Independent Laboratories (ACIL) publication, "Quality Control, Requirements for a Testing and Inspection Laboratory, Manual of Practice—1976." As a minimum, the manual should be structured in accordance with sections G2.6.1, G2.6.2, and G2.6.3 above.

Criterion G3. *The laboratory is operated in accordance with generally accepted professional and ethical business practices.*

G3.1 The laboratory has a stated and effective policy which assures that reported values accurately reflect all properly measured data.

G3.2 Documentary evidence assuring that:

G3.2.1 Test work is limited to that for which competence and capacity are available;

G3.2.2 Test data, records, and reports are treated as proprietary information and are released only to such other individuals as the client agrees to in writing;

G3.2.3 Complaints contesting test results are considered and properly handled.

G3.3 For a laboratory that is part of a larger organization, dependent on manufacturing or supplier interest: evidence that there is an independent decisional relationship between the testing and other components of the organization. (This may be demonstrated, for example, by a letter of authority from the parent organization management.)

G3.4 For a private laboratory that is not part of a larger manufacturing or supplier organization: evidence that there is an independent decisional relationship between the laboratory and other organizations, including clients (e.g., a policy declaration or a contract provision that the laboratory's relationships with these organizations are not allowed to affect the laboratory's capacity to render reports of findings objectively and without bias).

NOTE.—An evaluator will review the information supplied by the laboratory and compare it with other information provided under criteria G1 and G2 to evaluate compliance with this criterion. Particular attention will be paid under this criterion relative to complaints received about the laboratory by the Assistant Secretary. On-site examiners will verify the information supplied and will address any complaints which may have arisen.

Criterion G4. *During the processing of the application and following accreditation, the laboratory reports to NBS, within specified times, any substantive changes in the laboratory related to the general and specific crite-*

ria, and documents these changes as per the original submission.

G4.1 A description of the change mailed within 30 days following a substantive change relative to the general and specific criteria.

G4.2 Implementation within 45 days of the "official notice" date, or by the effective date, whichever is later, of all changes necessitated by a revision in the standard test method, unless another date is established by notice from NBS. (The "official notice" date is the date the organization responsible for the standard test method gives notice in its official publication that the standard has been revised. In some cases the organization may indicate a later "effective" date which will be used instead.)

NOTE.—An evaluator will evaluate changes as they may affect other aspects of the criterion and on-site examiners will report the absence of unreported substantive changes.

Specific Criteria. For each standard test method for which accreditation or continued accreditation is sought, an applicant laboratory shall provide the information required.

Criteria S1. *The laboratory is staffed with trained and experienced personnel competent in the principles and practices of measurement in the area of testing for which accreditation is sought.*

**S1.1 A list of, or the requirements of, the personnel responsible for and capable of conducting the tests specified in the test method, if not specifically addressed in the response to section G1.1.6 of the general criteria.

**S1.2 A description of the specific training program to assure proficiency and uniformity in applying the test method to the requisite degree of accuracy and precision (e.g., methods for ensuring job competence, probationary periods under close supervision, audits of test work performed, and performance reviews with affected personnel).

NOTE.—For each test method for which a laboratory requests accreditation, an evaluator will evaluate the competence of the personnel function and the training function. On-site examiners will compare resumes of personnel at the laboratory with the personnel requirements or resumes submitted by the laboratory in evaluating the laboratory under this criterion. Examiners will also address how newly trained personnel move into the work force, the nature of periodic reviews of competence, and the kinds of continuous education programs available. The on-site examiner will verify the content and utilization of training programs.

Criterion S2. *The laboratory's facilities and equipment are appropriate to the functions for which accreditation is sought and are properly maintained.*

**S2.1 A description of the test setups and a list of test instruments used, sufficiently identified to allow correlation with the calibration information requested in criterion S3. (Provide diagrams and photographs, if helpful in demonstrating conformance with the test requirements.)

**S2.2 A description of all special or laboratory-fabricated equipment listed in section S2.1, and evidence that this equipment conforms to the requirements of the test method and assures requisite accuracy and precision. (Provide schematics or shop drawings with annotated photographs, if helpful in demonstrating conformance with the test requirements.)

**S2.3 A description of any auxiliary equipment, facilities, or procedures required by or used for the test method, such as: storage and conditioning of samples; environmental conditions or controls (including how compliance is measured and percentage of time within required limits); automatic data collection, reduction or analysis; housekeeping, safety and custodial care; maintenance of laboratory equipment and facilities.

**S2.4 An inventory of the laboratory's collection of applicable standards and other documents referred to or used for the test method.

**S2.5 Evidence by analytical or other means that the test results are not degraded by the use of equipment or facilities which have received non-critical modifications not in strict conformance with the standard method of test.

NOTE.—For this criterion, an evaluator would evaluate the setups, instrumentation, special equipment, facilities, etc. of the laboratory as compared to the requirements of each test method for which accreditation is sought. Evidence would be examined to confirm that non-critical modifications have not degraded the test results. Information provided will not be considered confidential business data, trade secrets, or proprietary information. The on-site examiner during his visit to the laboratory would explore evidence justifying claims made by the laboratory by comparing selected measurements with the requirement of the test methods.

Criterion S3. *The laboratory's equipment and procedures are standardized (calibrated and verified) periodically.*

**S3.1 A description of the standardization equipment (including diagrams, etc., as appropriate) and a listing of the standardization schedule to ensure continuing adequate performance and accuracy of results.

**S3.2 Either references to recognized standardization procedures or descriptions of standardization procedures used for each laboratory standard and test instrument to assure that all measurements can be made to the requisite precision and accuracy.

**S3.3 A listing of the reference standards and materials being used with the test method, including:

**S3.3.1 The source, identity, latest dates and results of the standardization of the reference standards and materials;

**S3.3.2 For other than specifically required standards and standard reference materials, the procedures used to reference the standards to national standards;

**S3.3.3 Clear identification and differentiation between reference and working standards.

**S3.4 A listing of the measurement assurance, collaborative reference or other program(s), appropriate to the test method, in which the laboratory participates.

NOTE.—This criterion relates to the laboratory's fundamental program for establishing and maintaining basic references upon which its testing program is built. In some cases, much of the standardization procedures required herein will be part of an overall computerized laboratory program. In other cases, such standardization will be accomplished on a test method by test method basis. The evaluators and on-site examiners will be responsive to evaluation and verification in either case.

Criterion S4. *The laboratory maintains documented and acceptable in-house operating protocols for the test method to assure the requisite degree of accuracy and precision.*

**S4.1 A copy of the in-house instructions, if any, supplementing the instructions of the standard test method, including those necessary for equipment maintenance and calibration checks, sample preparation, testing and disposal, data reduction, and reporting of test results.

**S4.2 A copy of the instructions to the subcontractor and a description of how the laboratory assures the required precision and accuracy for any highly specialized part of the test method which is subcontracted.

NOTE.—Only that laboratory having the measuring equipment by which final test values are obtained can be accredited. If data obtained using one test method in this accreditation program are used as input data for a second test method, a laboratory seeking accreditation for the second method must be accredited for the first method also. In a laboratory's operating practice, if final test values for the first test method are obtained from an unaccredited laboratory, the client of the accredited laboratory must be notified. In general, if a NVLAP accredited laboratory does not or cannot, because of equipment failure, conduct a test method for which it has been accredited, it may supply data obtained from an unaccredited laboratory provided its client has been notified. If the data are obtained from a laboratory which is accredited for the test method, such notification is not necessary.

**S4.3 Evidence by analytical or other means that the use of noncritical variations in the procedure from that specified in the standard test method does not degrade the results of the test.

**S4.4 Evidence demonstrating the capability of satisfactorily complying with the intent of the standard test method when any variation in test equipment or procdures is made necessary by environmental conditions or by special requirements of a product for which accreditation is sought.

**S4.5 A sample test report (with name of client deleted) showing test results accompanied by the raw data and a copy of the worksheet showing the steps to reduce the raw data and the method of data reduction or reference to appropriate "calculation" sections of the test protocol or standard.

NOTE.—This criterion deals with the fundamental ability of the laboratory to obtain test results to the required precision and accuracy of the test methods. When reviewing data submitted by the laboratory, the evaluator's emphasis will be placed upon evaluation of instructions and procedures for the staff of the laboratory and for any subcontracted segments of the work. The applicability of nonconforming test procedures will also be carefully evaluated. A sample report will be reviewed and the on-site examiners will look for evidence that such sample reports are typical rather than specially produced for the accreditation program.

Proficiency Testing. Of utmost importance to the user of laboratory services is whether or not a testing laboratory consistently obtains accurate results. The existence of facilities, equipment and personnel, verified by a laboratory's ability to meet the preceding criteria, establishes the capability to obtain such results. An analysis of actual test results is necessary to determine if these ingredients do in fact produce the desired results.

A proficiency testing program may be considered an interlaboratory testing program in which specially prepared samples are distributed—on a periodic schedule. The samples are tested by the participating laboratories in accordance with standard test methods and the results reported to proficiency test evaluators. The "true" or target test result for any particular test is obtained by one of the following ways:

(1) *Manufacturer.* For some properties of a sample, it is possible to determine what the test result should be from information on how the sample was made. However, each case has to be thoroughly examined before manufacturing information can be used as the basis for determining the target or "true" values. This approach is often useful in proficiency testing programs requiring qualitative responses or identifications only (e.g. is starch present or not).

(2) *Reference Laboratory.* Sometimes a single laboratory, such as the National Bureau of Standards, has sufficiently high competence and national recognition that it can be used to provide the target or "true" test result. This is particularly useful when the laboratory has the capability of and has agreed to carefully verify the correctness of every important dimension of its apparatus and every step in its application of the standard test method.

(3) *Group of Reference Laboratories.* When no single laboratory can be given national recognition as having sufficiently high competence to set the national standard, it sometimes is possible for a proficiency test coordinator to use the results from a number of reputable laboratories. This would be accomplished by pooling their results (after a suitable statistical check on the agreement among the results) in order to establish the target or "true" test result.

(4) *Reference Method.* Under NVLAP procedures, the standard test method will usually also be the reference method. However, in some cases the standard test method may be so broadly written as to permit a wide variety of test equipment and testing protocols. If in such a case a particular protocol and equipment combination is recognized as a reference method (or can be shown through error analysis to yield results well within the required precision and accuracy), then the results obtained with that method by one or more "reference" laboratories is used to establish the target test result.

(5) *Participants.* If there is a sufficient number of participating testing laboratories and an insufficient number of reference laboratories, then the test results of the participating laboratories are sometimes pooled by a proficiency test coordinator to establish the target result for the individual participants. It is important that the pooled test results include only test data from laboratories known (on the basis of all available information) to be following the standard test method. This is determined not from the test data, but from an inspection report and from information submitted originally and with the test data.

(6) *Previous Proficiency Test and Interlaboratory Data.* Sometimes the same samples are used as were used in a previous proficiency test. If so, the new target test result is based on a weighted pooling of current and previous test results.

Most of the proficiency testing specified for NVLAP will consist of methods described in (5) and (6).

Another type of proficiency testing program makes use of samples of products which are being routinely tested. In this case, the sample, assumed to be homogeneous, is split into two parts, with the laboratory being evaluated testing one part and a refenence laboratory or laboratories testing the second part. Typically, the reference laboratory tests its portion of the sample only occasionally and comparisons of its results with the results obtained by the laboratory being evaluated are used to determine proficiency.

Although some sort of proficiency test could conceivably be designed for all test methods, that step is not always appropriate. Some test methods depend upon qualitative observations and others depend upon the proper and sequential use of measuring equipment. In the latter situation, proficiency can often be more easily established through observation by the on-site examiners. In addition, if proficiency is established for one test method, it would not appear to be necessary to conduct a second proficiency test for a method which is very similar and which simply requires the demonstration of the same skills as were demonstrated in the first test method.

On the basis of these considerations, proficiency tests have been arranged for the test methods shown in Table 2 of Appendix 1. This Table and the description which follows are not intended to be part of the criteria but rather are part of the program operations. Although it is intended that proficiency must be demonstrated for all the test methods shown in Table 2, that may not be feasible if an insufficient number of laboratories request accreditation for a given test method. In such a case, any fee collected for the proficiency test would be returned to the applicant laboratory and the accreditation would be based only on the information submitted by the laboratory and the on-site examiner's review.

Values for the desired precision and accuracy for the test methods in NVLAP-1 are shown in Table 1 of Appendix 1. For test methods requiring proficiency testing (Table 2), the precision and accuracy figures represent the values required for demonstrating "good" laboratory performance and the desired degree of proficiency. Approximately 95 percent of the laboratories should be able to achieve this. Limits approximately 50 percent greater are used to define "acceptable" performance for accreditation purposes. The frequency of proficiency testing is also shown in Table 2 of Appendix 1. For test methods not requiring proficiency testing, the precision and accuracy values suggest guides for desired capability.

Initial and Periodic Examination and Audit Procedures. Once a laboratory has satisfactorily completed the written questionnaire and evaluators have concluded that the laboratory appears to be qualified to conduct the tests for which accreditation has been requested, NBS will arrange for a mutually convenient time for the on-site examiners to visit the laboratory. At

the time of that visit, the laboratory will be provided with the inspection guide which the on-site examiner will use during the visit. The visit may last from one to three days or even longer depending on the number and complexity of the test methods for which accreditation is sought. The on-site examiner will conduct an exit interview with the laboratory management at the conclusion of the examination.

Laboratories will be granted accreditation for one year. The yearly accreditation fee must be paid each year. The fees and charges for this program are described in a separate notice published in this issue of the FEDERAL REGISTER.

Based upon the recommendation of the Committee, a scheduled on-site evaluation and a complete review of a laboratory's capability will be completed each year for the first two years and every two years thereafter. Unannounced visits may occur at any time with approximately one-third of the laboratories being visited each year. These visits may be initiated by the use of a random selection scheme or because the laboratory appears to have testing problems. A complete review of the laboratory is not planned for the unannounced visits. In the case of randomly selected visits, key items in the Laboratory will be checked. In the case of visits due to apparent problems, items relating to the problem will be checked. However, in both cases additional inspection may take place at the discretion of the examiner.

The National Bureau fo Standards will be responsible for the professional and technical performance of all examiners. The description which follows is not intended to be part of the criteria but rather is part of the program's operations. It is provided in order to give a potential applicant laboratory an indication of background and capabilities of personnel who will be employed to evaluate the laboratories. These procedures are subject to change as experience in the operation of the program is gained.

Evaluators will carefully review the completed questionnaire and prepare an evaluation of the laboratory indicating whether appropriate personnel, facilities, equipment, and procedures are provided which could produce accurate results. Examiners will be carefully trained to conduct the on-site examinations, so that these examinations will be consistently performed among the laboratories and so that subsequent examinations will be consistent. Personnel who are experienced in performing the specific test methods included in the program and in performing day-to-day laboratory operations will be used. These personnel will be government employees or will be specifically retained to perform certain aspects of the work. One of the key features in selecting personnel to work on this program will be the minimization of potential conflicts of interest.

REQUESTING ACCREDITATION

Any laboratory interested in being accredited by the Department of Commerce should write to the Department requesting information about the program. The address is: Assistant Secretary for Science and Technology, U.S. Department of Commerce, Room 3864, Washington, DC 20230. No commitment is implied or intended by such a request. The laboratory will receive a formal application accompanied by material which describes the program.

Laboratories will be accredited in groups so as to minimize costs of employing test method experts, to minimize travel costs, and to avoid one laboratory's receiving exclusive recognition. All applications postmarked by February 28, 1979 and accompanied by the required fee will be included in the first group of laboratories to be considered for accreditation. Applications received after this date will be included in a second group of laboratories to be considered for accreditation six months to one year later. It is suggested that those laboratories wishing to be in the first group mail a request for an application by February 7, 1979.

Issued: January 12, 1979.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

[3510-13-C]

Appendix 1

U.S. Department of Commerce
National Voluntary Laboratory Accreditation Program (NVLAP)

Criteria and Compliance
Information Supplement for
Thermal Insulation Materials
1/10/79

Table 1 establishes the performance requirements for the initial and continued accreditation of laboratories that test thermal insulation materials. It also lists measurement assurance aids which are available for helping laboratories maintain their testing performance. Evidence of appropriate use of such aids or their equivalent is required for accreditation.

The performance requirements are specified in terms of the desired precision and accuracy in applying the test method; that is, the overall precision and accuracy of application involving such potential sources of error as test operator, test environment, test equipment, test protocol and test sample. The capability of a laboratory to perform to these overall requirements is judged from the written information it submits in response to the examination material and from the findings of the on-site inspection. The ability of the laboratory to apply this capability is determined from the results of its performance in a proficiency testing program.

A NVLAP proficiency sample number designation and frequency of testing is shown in Table II for those test methods currently subject to proficiency testing requirements. Note: Participation in an NBS accepted collaborative reference program (CRP) may be accepted as partial fulfillment of the NVLAP proficiency testing requirement.

Precision is expressed in terms of repeatability (R) and comparability (C). Repeatability is a measure of the ability of a laboratory to repeat its own test result on the same or essentially identical samples. Comparability is a measure of the ability of a laboratory to compare two materials (intended for the same use), obtaining comparative test results (e.g. difference between or ratio of the two test results) consistent with comparisons obtained by other laboratories. Accuracy (A), is a measure of the ability of a laboratory to obtain a test result in agreement with the "true" or target test result.

The limits specified in the table for precision and accuracy are for "good" performance. Approximately 95% of the laboratories should be able to achieve this. Limits approximately 50 wider are used to define "acceptable" performance for accreditation purposes. CAUTION: The limits presented in this table for laboratory accreditation purposes should <u>not</u> be interpreted as setting specification limits on products.

In addition to utilizing the measurement assurance aids listed below for each test method, each laboratory should maintain a uniform batch of test specimens for more frequent checks of its performance (or should use other means for this purpose). The sources of currently available measurement assurance aids are listed at the end of the table. The table shows those programs currently available. As other aids become available, especially for methods not now covered, and are determined to be desirable for NVLAP, they will be added to the table.

The standards identified in this Appendix for accreditation under the provisions of NVLAP refer to the latest versions applicable.

TABLE 1

NVLAP Code Test Method No.	Complexity	Short title (property) Subtitle (if applicable)	Desired Precision and Accuracy	Measurement Assurance Aids
01/C01 ASTM C739 (para. 7.7 in 77 version)	B_2 [1/]	Corrosiveness; Cellulosic fiber (loose-fill)	Non-quantitative Test	
01/C02 MH-I-515 (para. 4.8.5 in D version)	B_2	Corrosiveness; Cellulosic fiber (loose-fill)	Non-quantitative test	
01/D01 ASTM C136	B_1	Sieve or screen analysis	R=4 percent aggregate A=4.4 percent aggregate	SRMs 1017a [2/] 1018a, 1019a

1/ See footnotes at the end of the table

NVLAP Code Test Method No.	Complexity	Short title (property) Subtitle (if applicable)	Desired Precision and Accuracy	Measurement Assurance Aids
01/D02 ASTM C167	B_1	Thickness and density Blanket and batt	Thickness: A-1/16 in. (1.0 mm) Density: A=2%	
01/D03 ASTM C209 (para. 6 in 72 version)	B_1	Thickness Board (cellulosic fiber)	A=0.1 mm	
01/D04 ASTM C209	B_1	Water absorption, 2 hr. Board (cellulosic fiber)	A=25% of percent water absorption	CTS CRP[3/]
01/D05 ASTM C209 by D1037 (para. 100-106 in 72 version)	B_1	Water absorption, 24 hr. Board (cellulosic fiber)	A=25% of percent water absorption	CTS CRP
01/D06 ASTM C209 by D1037 (para. 107-110 in 72 version)	B_2	Linear expansion Board (cellulosic fiber)	A=0.1 percent expansion	
01/D07 ASTM C272	B_1	Water absorption Core materials	A=25% of percent water absorption	CTS CRP
01/D08 ASTM C302	B_1	Density Preformed pipe insulation	Thickness: A = 1 mm Density: A = 2%	
01/D09 ASTM C303	B_1	Density Preformed block insulation	A = 2%	
01/D10 ASTM C355	B_2	Water vapor transmission Thick materials Desiccant method	A = 25%	CTS CRP
01/D11 ASTM C356	B_1	Linear shrinkage Soaking heat Preformed high temperature insulation	R = 0.5 percent linear shrinkage A = 0.5 percent linear shrinkage	
01/D12 ASTM C411	B_1	Hot-surface performance High temperature insulation	Warpage: A = 1 mm	
01/D13 ASTM C519	B_2	Density Loose-fill (fibrous)	A = 2%	
01/D14 ASTM C520	B_2	Density Granular loose-fill	A = 2%	
01/D15 ASTM D756	B_2	Weight and shape changes Accelerate service (Proc. A) Plastics	A=0.5 percent weight change A=0.5 percent linear dimension change A=1.5 percent volume change	
01/D16 ASTM D756	B_2	Weight and shape changes Accelerated service (Proc. B) Plastics	Same as for 01/D15	

NVLAP Code Test Method No.	Complexity	Short title (property) Subtitle (if applicable)	Desired Precision and Accuracy	Measurement Assurance Aids
01/D17 ASTM D756	B_2	Weight and shape changes Accelerated service (Proc. E) Plastics	Same as for 01/D15	
01/D18 ASTM D1622	B_2	Apparent density Rigid cellular plastics	A = 4%	
01/D19 ASTM D2126	B_2	Response to thermal and humid Aging (Procedure B) Rigid cellular plastics	A=0.5 percent weight change A=0.5 percent linear dimension change	
01/D20 ASTM D2126	B_2	Response to thermal and humid Aging (Procedure D) Rigid cellular plastics	Same as 01/D19	
01/D21 ASTM D2126	B_2	Response to thermal and humid Aging (Procedure E) Rigid cellular plastics	Same as 01/D19	
01/D22 ASTM D2126	B_2	Response to thermal and humid Aging (Procedure F) Rigid cellular plastics	Same as 01/D19	
01/D23 ASTM D2842	B_2	Water absorption Rigid cellular plastics	A = 1.0 percent absorption (by volume)	CTS CRP
01/D24 ASTM C739 (para. 7.5 in 77 version)	B_2	Moisture absorption Cellulosic fiber (loose-fill)	A=25% percent water absorption	CTS CRP
01/D25 HH-I-515 (para 4.8.3 in D version)	B_2	Moisture absorption Cellulosic fiber (loose-fill)	A=25% percent water absorption	CTS CRP
01/D26 HH-I-515 (para. 4.8.1 in D version)	B_2	Settled density Cellulosic fiber (loose-fill)	A = 3%	CTS CRP
01/F01 ASTM D777 as modified by Federal Specification H-H-B-1008	B_1	Flammability Paper and paperboard	Char length: R = 3.6% A = 9.0% Fire resistance permanence: R = 6 percent increase in char length A = 10 percent increase in char length	
01/F02 ASTM E84	B_3	Surface burning characteristics Building materials Loose-fill	Flame spread classification: A = 20% Smoke classification: A = 40%	CTS CRP
01/F03 ASTM E84	B_3	Surface burning characteristics Building materials Blanket and batt	Same as 01/F02	CTS CRP
01/F04 ASTM E84	B_3	Surface burning characteristics Building materials Board and Block	Same as 01/F02	CTS CRP

NVLAP Code Test Method No.	Com-plex-ity	Short title (property) Subtitle (if applicable)	Desired Precision and Accuracy	Measurement Assurance Aids
01/F05 ASTM E136	B_1	Noncombustibility Elementary materials	Primarily a non-quantitative test	
01/F06 ASTM C739 (para. 10.4 in 77 version)	B_3	Flame resistance permanency cellulosic fiber (loose-fill)	A=20% flame spread	CTS CRP
01/F07 HH-I-515 (para. 4.8.7 in D version)	B_3	Critical radiant flux Radiant Panel (cellulosic fiber, loose-fill)	A = 14% R = 20%	CTS CRP
01/F08 HH-I-515 (para. 4.8.8 in D version)	B_2	Smoldering combustion cellulosic fiber (loose-fill)	A = 20% R = 20%	CTS CRP
01/S01 ASTM C165	B_2	Compressive properties Thermal Insulation Procedure A	A = 4%	CTS CRP TMVS[4]
01/S02 ASTM C203	B_2	Breaking load/flexural strength Preformed block insulation	Breaking load: A = 2% Flexural strength: A = 10%	CTS CRP TMVS
01/S03 ASTM C209 (para. 9 in 72 version)	B_2	Transverse strength Board (cellulosic fiber)	A = 4%	CTS CRP TMVS
01/S04[5] ASTM C209 (para. 10 in 72 version)	B_2	Deflection at specified load Board (cellulosic fiber)	A = 0.2 mm	CTS CRP TMVS
01/S05 ASTM C209 (para. 11 in 72 version)	B_2	Tensile strength Parallel to surface Board (cellulosic fiber)	A = 15%	CTS CRP TMVS
01/S06 ASTM C209 (para. 12 in 72 version)	B_2	Tensile strength Perpendicular to surface	A = 4%	CTS CRP TMVS
01/S07 ASTM C273	B_2	Shear test Sandwich construction	A = 25%	CTS CRP TMVS
01/S08 ASTM C446	B_2	Breaking load/modulus of rupture Preformed pipe insulation	Breaking load: A = 2% Modulus of rupture: A = 5%	CTS CRP TMVS
01/S09 ASTM D781	B_2	Puncture test Paperboard and fiberboard	R = 7.3% A = 8.0%	

NVLAP Code Test Method No.	Com-plex-ity	Short title (property) Subtitle (if applicable)	Desired Precision and Accuracy	Measurement Assurance Aids
01/S10 ASTM D828	B_2	Tensile breaking strength Paper and paperboard	R = 5% C = 9% A = 11%	TAPPI CRP[6/] or CTS CRP
01/S11 ASTM D1621	B_2	Compressive properties Rigid cellular plastics Procedure A - Crosshead	A = 6%	CTS CRP TMVS
01/T01 ASTM C177	B_3	Thermal transmission properties Low-temperature guarded hot plate Loose-fill	R = 1% A = 4%	SRM 1450 CTS CRP
01/T02 ASTM C177	B_3	Thermal transmission properties Low-temperature guarded hot plate Compressible blanket and batt	R = 1% A = 4%	SRM 1450 CTS CRP
01/T03 ASTM C177	B_3	Thermal transmission properties Low-temperature guarded hot plate Rigid board and block	R = 1% A = 4%	SRM 1450 CTS CRP
01/T04 ASTM C236	B_3	Thermal conductance Guarded hot box	A = 4%	CTS CRP
01/T05 ASTM C335	B_3	Thermal conductivity Pipe insulation	A = 4%	CTS CRP
01/T06 ASTM C518	B_3	Thermal transmission properties Heat flow meter Blanket and batt	R = 1% A = 4%	SRM 1450 CTS CRP
01/T07 ASTM C518	B_3	Thermal transmission properties Heat flow meter Board	R = 1% A = 4%	SRM 1450 CTS CRP
01/T08 ASTM C518	B_3	Thermal transmission properties Heat flow meter Loose-fill	R = 1% A = 4%	SRM 1450 CTS CRP
01/T09[7/] ASTM C653	B_3	Thermal resistance (Rec. Practice) Blanket (mineral fiber)	See 01/T02 and 01/T06	See 01/T02 and 01/T06
01/T10[7/] ASTM C687	B_3	Thermal resistance (Rec. Practice) Loose-fill (fibrous)	See 01/T01, 01/T04 and 01/T08	See 01/T01, 01/T04 and 01/T08
01/V02 ASTM D591	B_1	Starch in paper Qualitative test	non-quantitative test	
01/V03 ASTM D2020	B_2	Mildew (fungus) resistance Paper and paperboard	non-quantitative test	
01/V04 ASTM E96	B_2	Water vapor transmission Thin sheets Procedure A	R = 19% A = 25%	SRM 707
01/V05 HH-I-515 (para. 4.8.6 in D version)	B_2	Fungus; Cellulosic fiber (loose-fill)	non-quantitative test	
01/V06 HH-I-515 (para. 4.8.9 in D version)	B_1	Starch, Cellulosic fiber (loose-fill)	non-quantitative test	

Footnotes:

1/ The letter B followed by a numerical subscript 1, 2 or 3 indicates the complexity of the test method for examination purposes. Subscript 1 indicates relatively simple test methods, subscript 2 indicates moderate test methods and subscript 3 indicates complex test methods.

2/ SRM - Standard Reference Materials may be obtained from the National Bureau of Standards. Ordering information may be obtained from the Office of Standard Reference Materials, B311 Chemistry Bldg., National Bureau of Standards, Washington, D.C. 20234. (Telephone: (301) 921-2045)

3/ CTS CRP - Collaborative Reference Program for Thermal Insulation co-sponsored by the Collaborative Testing Services, Inc. and NBS. Information may be obtained from NBS Collaborative Reference Programs, A05 Technology Bldg., National Bureau of Standards, Washington, D.C. 20234. (Telephone: (301) 921-2946)

4/ TMVS - Testing Machine Verification Service is obtainable from a number of sources. Specify verification to ASTM Standard E4. Most manufacturers of testing machines can provide information on sources of verification service.

5/ Eligible for accreditation only if accredited for 01/S03.

6/ TAPPI CRP - Collaborative Reference Program co-sponsored by the Technical Association of the Pulp and Paper Industry and NBS. Information may be obtained from NBS Collaborative Reference Programs, A05 Technology Bldg., National Bureau of Standards, Washington, D.C. 20234. (Telephone: (301) 921-2946)

7/ Eligible for accreditation only if laboratory is accredited for C177, C236 or C518 for same class of materials.

TABLE 2

NVLAP Test Method Code	Proficiency Sample Designation	Test Frequency Times per year	Comment
01/D04	P.S. 01/01	2	accreditation for one or more of D04, D05, D07 requires proficiency in only one P.S. 01/01 test
01/D05	P.S. 01/01	2	accreditation for one or more of D04, D05, D07 requires proficiency in only one P.S. 01/01 test
01/D07	P.S. 01/01	2	accreditation for one or more of D04, D05, D07 requires proficiency in only one P.S. 01/01 test
01/D10	P.S. 01/02	2	
01/D23	P.S. 01/03	2	
01/D24	P.S. 01/04	2	a single proficiency test is needed for either D24 or D25
01/D25	P.S. 01/04	2	a single proficiency test is needed for either D24 or D25
01/D26	P.S. 01/05	2	
01/F02	P.S. 01/06	2	
01/F03	P.S. 01/07	2	
01/F04	P.S. 01/08	2	
01/F06	P.S. 01/06	2	
01/F07	P.S. 01/06	2	
01/F08	P.S. 01/06	2	
01/S01	P.S. 01/07	2	
01/S02	P.S. 01/07	2	
01/S03			Both S01 and S02 proficiency tests are required for accreditation of any one or all S03, S04, S05, S06, S07, S08
01/S04			
01/S05			
01/S06			
01/S07			
01/S08			

NVLAP Test Method Code	Proficiency Sample Designation	Test Frequency Times per year	Comment
01/S10	P.S. 01/08	6	
01/S11			Both S01 and S02 proficiency tests are required for accreditation of S11
01/T01	P.S. 01/09	2	loose-fill and batt proficiency sample
01/T02	P.S. 01/10	2	batt proficiency sample
01/T03	P.S. 01/11	2	board and batt proficiency sample
01/T04[1/]	P.S. 01/12		not required if in T03 or T07 test
01/T05	P.S. 01/13	2	
01/T06	P.S. 01/10	2	not required if in T02 test
01/T07	P.S. 10/11	2	not required if in T03 test
01/T08	P.S. 01/09	2	not required if in T01 test

Footnote:

1/ Laboratories seeking accreditation for 01/T04 while not also seeking accreditation for 01/T03 or 01/T07 will be required to perform proficienty tests using the guarded hot box during on-site laboratory inspection visits.

APPENDIX 2
EXAMPLE PERSONNEL REQUIREMENTS 1/

	EDUCATION	EXPERIENCE		NATURE OF EMPLOYMENT (full or part time)	AFFILIATIONS
GENERAL MANAGEMENT	This individual, or group of individuals, may or may not be involved at the technical level. They could be full time or part time employees of the firm. In either case, they should become familiar with the broad technical aspects of the business, so as to make policy decisions consistent with quality testing.				
TECHNICAL DIRECTOR	Minimum of a B.S. degree or demonstrated capability in applicable field.	Shall possess applicable professional license or certificates in one or more fields directed.	Minimum of 5 years in one or more fields directed. Must demonstrate capability in applicable field.	Full time employee of the Laboratory.	Holds affiliations with the technical and professional societies pertinent to fields.
TECHNICAL SUPERVISOR	B.S.Degree or 5 years experience. Both relevant to the technology supervised.	Shall possess applicable licenses or certificates in one or more fields directed.	1 year with degree full time or 5 years w/o under qualified technical director in field supervised.	Full time.	Holds affiliations with the technical and professional societies pertinent to fields.
ENGINEERING OR SCIENTIFIC STAFF	B.S. degree or equivalent pertinent to field of work.	Working towards or has achieved any applicable license or certificate.	On job training by supervisor or predecessor.	Full or part time.	Holds affiliations with the technical and professional societies pertinent to fields.
TECHNICAL STAFF	High School graduate or equivalent.	Shall strive for any applicable certificates in their field.	Sufficient "on-the-job" training and/or trade school. Competence must be demonstrated.	Part or Full Time.	
CONSULTANT	An individual, who by academic training, work experience, or both brings the Laboratory technical skills and expertise equivalent to those of a Technical Supervisor on a part time basis.				
SUPPORT STAFF	Sufficient "on-the-job" training by a supervisor or predecessor so that job is performed properly.				

1/ This Appendix is adopted from the chart, "Recommended Personnel Basic Requirements" from the American Council of Independent Laboratories (ACIL) publication, "Quality Control, Requirements for a Testing and Inspection Laboratory, Manual of Practice - 1976." The qualifications given in this Appendix should not be interpreted as minimum or typical requirements for personnel in the NVLAP program.

APPENDIX 3

INDEX OF TEST METHODS AND RECOMMENDED PRACTICES
APPLICABLE TO THE NVLAP FOR THERMAL INSULATION MATERIALS

ASTM designation:	Title
C177	Steady-state thermal transmission properties by means of the guarded hot plate.
C518	Steady-state thermal transmission properties by means of the heat flow meter..
C335	Thermal conducitivity of pipe insulation.
C236	Thermal conductance and transmittance of built-up sections by means of the guarded hot box.
C653	Recommended practice for determination of thermal resistance of low-density mineral fiber blanket-type building insulation.
C687	Recommended practice for determination of thermal resistance of low-density fibrous loose fill-type building insulation.
C167	Tests for thickness and density of blanket- or batt-type thermal insulating materials.
C302	Test for density of preformed pipe-covering-type thermal insulation.
C303	Test for density of preformed block-type thermal insulation.
C519	Test for density of fibrous loose fill building insulations.
C520	Test for density of granular loose fill insulations.
D1622	Test for apparent density of rigid cellular plastics.
C136	Sieve or screen analysis of fine and coarse aggregates.
C356	Test for linear shrinkage of preformed high-temperature thermal insulation subjected to soaking heat.
C355	Tests for water vapor transmission of thick materials.
D2842	Test for water absorption of rigid cellular plastics.
D2126	Test for response of rigid cellular plastics to thermal and humid aging.
D591	Test for starch in paper.
C272	Test for water absorption of core materials for structural sandwich constructions.
D756	Tests for resistance of plastics to accelerated service conditions.
C411	Test for hot-surface performance of high-temperature thermal insulation.
C165	Test for compressive strength or preformed block-type thermal insulation.
C203	Test for breaking load and calculated flexural strength of preformed block-type thermal insulation.

C446	Test for breaking load and calculated modulus of rupture of preformed insulation for pipes.
D781	Tests for puncture and stiffness of paperboard, corrugated and solid fiberboard.
D828	Test for tensile breaking strength of paper and paperboard.
C209	Testing insulating board (cellulosic fiber), structural and decorative.
C273	Shear test in flatwise plane of flat sandwich constructions or sandwich cores.
E84	Test for surface burning characterisitics of building materials.
E136	Test for noncombustibility of elementary materials.
E96	Test for water vapor transmission of materials in sheet form.
D2020	Tests for mildew (fungus) resistance of paper and paperboard.
D777	Test for flammmability of treated paper and paperboard.
C739	Cellulosic fiber (wood-base) loose-fill thermal insulation. Test for flame resistance, corrosion, and moisture absorption.

Federal designation:

HH-I-515	Insulation thermal (loose fill for pneumatic or poured application) cellulosic or wood fiber. Test for settled density, smoldering combustion, corrosion, moisture absorption, starch, and fungus.

[FR Doc. 79-1706 Filed 1-17-79; 8:45 am]

[3510-13-M]

NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM

Fees and Charges To Accredit Laboratories Which Test Thermal Insulation Materials

In a separate notice appearing in this issue of the FEDERAL REGISTER, the Department of Commerce announced the issuance of general and specific criteria for accrediting testing laboratories that test thermal insulation materials. Pursuant to paragraph (a) of § 7.10 of the Procedures for a National Voluntary Laboratory Accreditation Program (15 CFR Part 7) notice is hereby given of the fees and charges which the Secretary of Commerce (Secretary) has established for this laboratory accreditation program (LAP).

Basis for Fees: Fees and charges have been established on the basis that each laboratory in the program will be evaluated annually for the first two years of enrollment and once every two years thereafter. This evaluation schedule has been adopted as a compromise between the two year schedule originally proposed for the program on September 29, 1978 (43 FR 45298), and the recommendation of the National Laboratory Accreditation Criteria Committee which urged that evaluations be conducted every year. The fees cited in this notice have been increased from those originally proposed in order to reflect the more frequent inspections during the first two years.

The fees and charges cover the cost of examining, accrediting, and auditing laboratories that test thermal insulation materials. The fees also include a contingency factor to cover the cost associated with conducting unannounced re-inspection visits for up to one-third of the participating laboratories. The Department of Commerce's administrative cost associated with developing this LAP has not been included.

It is unlikely that any one laboratory will seek accreditation for all of the various test methods which are included in this LAP. Therefore, the fees have been established on the basis of allowing total charges to vary with the number and complexity of the individual test methods selected by the laboratory seeking accreditation.

Fees and Charges: The fee to any laboratory will be determined by the following equation:

$$F=A+B_1(N_1)+B_2(N_2)+B_3(N_3)+ \ldots .$$

where F is the fee in dollars. A is a fixed charge in dollars to cover administrative and some basic examination costs associated with the program operation. B is a variable charge in dollars which covers the examination costs for evaluating a laboratory's capability to meet the specific criteria for each test method. N is the number of test methods for which the laboratory requests accreditation.

Subscripts 1, 2, and 3 represent the three levels of complexity into which the test methods fall when considered for examination purposes. The fee per method for the simpler test methods is represented as B_1. N_1 is the number of such test methods. B_2 is the fee per method for test methods of intermediate complexity and N_2 is the number of such test methods. The most complex test methods and the number of each are represented by B_3 and N_3 respectively. Values for each coefficient in the equation are: A=$750, B_1=$75, B_2=$125, and B_3=$175. The level of complexity for each test method is shown by the letter B with subscripts 1, 2, and 3 in the column, labeled "Complexity" in Table 1 of Appendix 1 to the FEDERAL REGISTER announcement referenced in the first sentence of this notice.

Proficiency Sample Fees: In addition to the basic inspection and evaluation charges referenced above, there will be a fee associated with proficiency sample testing where such tests are required. Table 2 in Appendix 1 referred to above identifies those test methods for which proficiency sample tests are currently required in this LAP. Proficiency sample fees pay for distribution of samples (where appropriate), the collection and analysis of the data, and the reporting of results. The fee for proficiency sample testing associated with each of the test methods is nominally $80 for each test performed. In most instances where proficiency testing is prescribed for test methods in the LAP, it is a requirement of the program that such testing be performed twice yearly. Thus, for each test method identified in Table 2 of Appendix 1 for which a laboratory desires accreditation, an additional fee of $160 is required. Explicit instructions regarding proficiency testing will be supplied with examination materials.

As explained under issue 4 in the FEDERAL REGISTER announcement referenced in the first sentence of this notice, the proficiency testing requirement for this LAP will be fulfilled by enrollment in a CTS CRP for the tests requiring NVLAP proficiency testing and the successful attainment of precision and accuracy of NVLAP.

Example Calculation: In order to clearly illustrate the annual cost for accreditation, the following example is provided. If a laboratory was to choose to be accredited for four simple test methods (B_1), three intermediate test methods (B_2), and two complex test methods (B_3), the fee equation would become:

$$F=\$750+\$75(4)+\$125(3)+\$175(2)=\$1,775$$

Added to this would be the cost of proficiency testing. If proficiency sample tests were required twice annually for two of these nine test methods at a cost of $80 each, the total cost of proficiency sample testing would be $320. The total annual accreditation cost for the testing laboratory in this example would be $2,095.

Inquiries: Any inquiries may be addressed to Dr. Howard I. Forman, Deputy Assistant Secretary for Product Standards, Room 3876, U.S. Department of Commerce, Washington, DC 20230, 202-377-3221.

Dated: January 12, 1979.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

[FR Doc. 79-1707 Filed 1-17-79; 8:45 am]