1916 Race Street, Philadelphia, PA 19103-1187 USA ■ Telephone: (215) 299-5400 ■ TWX: 710-670-1037 ■ FAX: 215-977-9679

Committee D-2 on PETROLEUM PRODUCTS AND LUBRICANTS

Reply to: T.C. Boschert
Ethyl Petroleum Add. Div.
125 Lafayette
St. Louis, MO 63104
(314) 241-6119

October 31, 1988

Mr. Dean Bardy
LUBRIZOL CORPORATION
29400 Lakeland Blvd.
Wickliffe, OH 44092

Dear Dean:

As requested by the Technical Guidance Committee of the Test Monitoring Board, a small group composed of G. Farnsworth, D. Heath, and myself have reviewed the enclosed document and have some suggested changes for the consideration of your committee. We have strived to maintain the spirit of what was requested by the various surveillance panels in our changes. Our approach was not to rewrite the document but simply to correct some needed statements and to insert one passage to indicate the role that the TMC plays and its effect on these guidelines in running the tests.

As requested, I am forwarding the changes to the Test Monitoring Center to mail out on their information letter mailing list. This will allow surveillance panels to be better prepared to deal with them at our December, 1988, meetings in Anaheim. I would be remiss without thanking both Gordon and Dan for their conscientious efforts in the revision of this document. In particular, I would like to thank Dan Heath for much of the wording in our revision.

Sincerely,

T.C. Boschert
Member, Technical Guidance Committee
ASTM Test Monitoring Board

1916 Race Street, Philadelphia, PA 19103-1187 USA ■ Telephone: (215) 299-5400 ■ TWX: 710-670-1037 ■ FAX: 215-977-9679

Committee D-2 on PETROLEUM PRODUCTS AND LUBRICANTS

The Technical Guidance Committee Task Force to Revise the ASTM D-2 Equipment Supply Guidelines Document Recommends the Following Changes:

1. Revision of 2.2: Critical equipment - the components, apparatus, reagents, and reference and test materials which by virtue of particular specification or function have a significant effect on the quality of results obtained by a standard method of practice.

   Reason: This definition should be specific enough that most of the ordinary items can be exempted from critical status. The way the original definition reads we would find only a few items that do not "have a significant effect on the results". For example, relatively few items could be omitted from a method without affecting results. We believe the intention was to identify the items which are actually critical to the success of the method. But that is not what the definition says.

2. Revision of 2.3: Non-critical equipment - the components, apparatus, reagents, and reference and test materials, which, assuming routine, commonly accepted functionality, do not have a significant effect on the quality of results obtained by a standard method or practice.

   Reason: Same as No. 1 above.

3. Revision of 3.1.3: The procurement of test equipment to the original equipment standards or specifications is the responsibility of the testing laboratories in cooperation with the equipment manufacturers as represented in the committee and sub-committee groups. The Equipment Manufacturer shall advise the testing laboratories and/or pertinent committee of any necessary changes or deviations from these standards. Such changed equipment shall then be considered replacement equipment and its acceptability assessed in accordance with paragraph 3.3

Reason: It is very presumptuous to claim that the manufacturer of test equipment is totally responsible for the manner in which some purchaser uses the equipment. An exception might be the small percentage of cases in which the method represents the only application for the equipment, or the case where the item was designed specifically for the method.

4. Revision of first sentence of 3.2.1: The prospective equipment is established as equivalent by qualified laboratory testing of the proposed equipment to show compliance with the original equipment specifications.

   Reason: Same as No. 3 above.

5. Revision of 3.2.3: The maintenance of equivalent equipment specifications is the responsibility of the testing laboratories in cooperation with the Equipment Manufacturers as represented in the Committee and Sub-committee groups. Where equivalent equipment becomes a portion of the original equipment, the original equipment supplier shall not be responsible for the performance of the equivalent equipment.

   Reason: Same as No. 3 above.

6. Review of first sentence only of 3.3.1: The acceptability of replacement equipment may be established at the judgment of the committee by a statistically valid program preferably conducted by an independent laboratory.

   Reason: Not all replacement equipment will require a paired testing program. This is best left to the committee to decide what is proper for acceptance of the replacement equipment.

7. Revision of first sentence only of 5.2.2: Original equipment for which the required data is not or will not be available prior to the discontinuance of the equipment shall be dropped from consideration.

   Reason: Same as No. 3 above.

8. Additional text: 5.4 - Methods Serviced by the ASTM Test Monitoring Center.

   A committee may, by simple majority vote, waive the

requirements outlined in paragraphs 5.2 through 5.3, in full or in part, for those test methods which are served by the Test Monitoring Center (TMC). The methods assigned to TMC engineering staff are complex, are often dependent on representative mass produced hardware and are, therefore, carefully monitored and calibrated according to the provisions of the ASTM TMC charter and by-laws. The monitoring system requires flexibility so that statistically charted trends may be dealt with appropriately and expeditiously.

We believe the proposed text of 5.4 would enable our surveillance panels to honor the spirit of this document without bringing our system to its knees! We hope that the D-2 Committee membership realizes that an age of quality consciousness has dawned. Very simply, the systems of standardization must satisfy the needs of the systems' customers or market forces will replace the old systems with attractive alternatives.

Respectfully,

T.C. Boschert
G.R. Farnsworth
D. Heath

GUIDELINES FOR

EQUIPMENT SUPPLY, LISTING AND REPLACEMENT IN ASTM D-2 METHODS AND PRACTICES

1. Introduction

As a general policy ASTM prefers that the test equipment used in ASTM methods and practices be described in generic terms and not by listing a single piece of equipment made by a specific manufacturer. However a number of methods and their precision statements have been developed around such equipment which is then - listed as being available from a specific manufacturer.

In some cases all or part of such equipment can become unavailable, requiring replacement, or it may be desirable to replace part of the original equipment with equivalent or improved equipment.

Under these circumstances Committee D-2 has found it desirable to formalize a set of guide lines which describe the actions required when such specific listings, substitutions or replacements take place. Committee D-2 does not endorse listings of test equipment available from only one manufacturer but offers these Guide Lines for such cases when it is agreed that such listings cannot be avoided.

2. Definitions

2.1. The following definitions apply only to these Guide-Lines.

2.2. Critical equipment - the components, apparatus, reagents, and reference and test materials which, in the judgement of the Committee, have a significant effect on the results obtained by a standard method or practice.

2.3. Non-critical equipment - the components, apparatus, reagents, and reference and test materials, which in the judgment of the Committee, do not have a significant effect on the results obtained by a standard method or practice.

2.4. Original equipment - the critical equipment (components, apparatus, reagents or reference materials) used in the development of the original published precision program of a method or the development of a go-no-go method.

2.5. Equivalent equipment - the critical equipment (components, apparatus, reagents or reference materials) considered equivalent to the original equipment by meeting the specifications for the original equipment.

2.6. Replacement equipment - the critical equipment (components, apparatus, reagents or reference materials) needed to replace original equipment for which no specification exists.

2.7. Committee - the main committee having jurisdiction over the standard method, or its designated subsidiary such as a subcommittee, section etc.

2.8. Independent laboratory - a neutral laboratory capable of conducting the test in question.

3. PROCEDURES

3.1. Original Equipment

3.1.1. Upon approval of a standard test method or practice the Committee should designate the critical and non-critical portions of the original equipment in the method or practice. Wherever possible, original equipment should be defined by adequate composition, design and/or performance specifications to permit securing equivalent equipment. The specifications should contain allowable tolerances for each specified parameter, with the tolerances based on the manufacturing tolerances of the original equipment. Wherever possible the method should contain applicable calibration procedures to insure that the test results will bear a direct relation to test data developed elsewhere.

3.1.2. The identification of critical and non-critical components as well as the specifications for critical components shall be incorporated into the Apparatus or Reagents and Materials sections or into an annex to the method, practice etc. If the specifications are too bulky to be included into an annex they shall be incorporated into a research report filed at ASTM Headquarters with proper reference in the method. (An example of an equipment specification published in the Apparatus Section will be found in D2622, "Sulfur in Petroleum Products, X-Ray Spectroscopic Method". An example of equipment specifications in an annex to the method will be found in D93, "Flash Point by Pensky-Martens Closed Cup Tester". An example of a specification in a research report will be found in Research Report D-2 RR 1012 and its associated method, D2276, "Particulate Contaminants in Aviation Fuel".)

3.1.3. The manufacture of test equipment to the original equipment standards or specifications is the responsibility of the equipment manufacturer who shall advise the pertinent Committee of any necessary changes or deviations from these standards. Such changed equipment shall then be considered replacement equipment and its acceptability assessed in accordance with paragraph 3.3.

3.1.3.1. It is recognized that certain complex test apparatus may not be defined by specifications which will allow the selection of equivalent equipment. Changes in such apparatus shall be handled as replacement equipment.

3.2. Equivalent Equipment

3.2.1. The prospective equipment vendor establishes equivalence by having an independent laboratory test the proposed equipment to show compliance with the original equipment specifications. Where tolerances are not available, side-by-side testing with the original equipment can be evidence of equivalence. The number of equipment pieces or samples required for equivalence testing depends primarily on the desired reliability of the results. However parts should be tested at least in triplicate and test samples should be selected at random and from more than one productions batch.

3.2.2. The program and results of equivalence testing shall be reviewed and considered acceptable by the Committee prior to listing of the equivalent supplier. Equivalence in precision and level of results must be shown.

3.2.3. The maintenance of equivalent equipment to the original equipment specifications is the responsibility of the equivalent equipment manufacturer. Where equivalent equipment becomes a portion of the original equipment, the

original equipment manufacturer shall not be responsible for the performance of the equivalent equipment.

3.3. Replacement Equipment

3.3.1. The acceptability of replacement equipment is best established by a statistically valid program of pair testing of original and replacement equipment, preferably by an independent laboratory. The program should address both manufacturer's and customer's risks (Type I and Type II errors*).

3.3.1.1. If the testing results show no statistically significant difference between the original and the replacement equipment the replacement equipment shall be considered acceptable and the precision statement based on the original equipment can be used.

3.3.1.2. If the testing shows statistically significant differences between the original and the replacement equipment, a new precision program per Research Report D-2 RR 1007, using the replacement equipment, is required to develop a new precision statement for the replacement equipment.

3.3.2. Any replacement program shall not be undertaken without the knowledge of the Committee.

3.3.3. Final agreement over the acceptability of replacement testing results rests completely with the Committee.

4. SUPPLIER LISTING

4.1. Listing of original, equivalent or replacement equipment available from only one supplier shall be in accordance with ¶F4.2.2 of the Form and Style Manual for ASTM Standards. Where more than one supplier is available the list of suppliers shall be maintained in an appendix to the method or at ASTM Headquarters with appropriate references in the method. As many suppliers as possible should be listed to assist the user. Supplier listing should be by firm name, city and state or country only.

4.1.1. Suppliers should only be listed if the equipment is not readily available through normal commercial sources.

4.1.2. The Committee shall make reasonable efforts early in the development of a method or practice to involve as many equipment suppliers as practical to avoid single supply sources. However a supplier's proprietary rights should be considered.

4.2. It is the responsibility of the Committee to assure itself that equipment is available to the public so that a specific method can be preformed. Each time an existing standard is reviewed or revised the Committee shall make such determination.

4.3. Changes in supplier listing shall only be made with the approval of the Committee.

4.4. If an equipment manufacturer sells or transfers a line of original, equivalent or replacement equipment to another manufacturer, the new manufacturer shall only be listed after the Committee has assured itself that the new equipment

*See Introduction to Statistical Analysis, Dixon and Massey, McGraw Hill, New York, 1957

meets the same specifications as the equipment made by the first manufacturer. In cases of doubt the equipment made by the second manufacturer should be considered as replacement equipment and should be tested as such.

5. COMMITTEE RESPONSIBILITIES

5.1. Applicable Regulations

5.1.1. Regulations Governing ASTM Technical Committees shall be in effect with full appeal process.

5.2. New Methods or Practices

5.2.1. The Committee should obtain specifications, dimensional drawings and other necessary descriptions of test equipment and components for new methods and practices prior to the adoption of the new method or practice but no later than 180 days after approval. The Committee should determine which items are Critical Equipment within another 60 days. The resultant listings and annex data should be submitted for the next regular Committee ballot if not approved earlier. Only that equipment shall be listed which was involved in the original round robin to establish method precision. All other submissions shall be validated in accordance with paragraphs 3.2 or 3.3.

5.2.1.1. All methods and practices shall contain the identification of critical and non-critical equipment.

5.2.1.2. Where an equipment supplier has developed equipment at his own expense and considers the equipment design to be proprietary, the Committee by a simple majority vote may waive the specification requirements of 5.2.1 for such equipment. Such waivers should be agreed to before any ASTM evaluation or testing of the equipment.

5.2.1.3. Where proprietary equipment in standard methods or practices has been supplied prior to December 1985, such arrangements shall be exempt from the requirements of 5.2.1.

5.2.2. A manufacturer or supplier of original equipment who does not supply the required data or will not guarantee to supply them prior to discontinuance of the equipment shall be dropped from consideration. Alternate sources of equipment should be developed. Such equipment shall be considered as new equipment requiring the development of a new precision statement. If alternate equipment sources cannot be developed the method shall be dropped from consideration.

5.2.2.1. These requirements should be discussed with equipment suppliers early in method development to avoid misunderstandings and lost time and effort.

5.3. Existing Methods and Practices

5.3.1. The requirements outlined in paragraphs 5.2 through 5.2.2 should be introduced into existing methods and practices as soon as feasible but not later than during method or practice reapproval.

6. REVIEW OF GUIDE LINES

6.1. A complete review of these Guide-lines shall be carried out two years after their adoption and the resultant Guide-lines shall be reballotted. This review and reballot is based on the concern that the total impact of the Guide-lines on a voluntary system is unforeseeable and a formal second look is in order to assure that the Guide-lines have the desired effect of improving Committee operations.