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Technical Association of
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Standard Test Method for Odor of Petroleum Wax¹

This standard is issued under the fixed designation D1833; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers a procedure for rating the odor intensity of waxes derived from petroleum.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Terminology

2.1 Definitions:

2.1.1 *odor* (of a wax)— numerical rating corresponding to the odor scale description that best fits the sample being tested.

3. Summary of Test Method

3.1 Odor test specimens are prepared from petroleum wax by placing approximately 10 g of thin shavings on odor-free paper or glassine. Individual test specimens are then evaluated for odor by each panel member and assigned the number corresponding to the odor scale description best fitting the intensity of the odor. As an alternative procedure, the wax shavings are placed in bottles, with each panel member making the odor evaluation between 15 min and 60 min after the specimens are prepared. The average of the panel rating is reported as the odor rating of the sample.

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.10.0A on Physical/Chemical Properties.

This test method was adopted as a joint ASTM-IP Standard in 1965. In the IP, this method is under the jurisdiction of the Standardization Committee.

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4. Significance and Use

4.1 In some uses of petroleum wax, such as food packaging, odor intensity of the wax is an important property. For example, some description of limits on wax odor often appears in specifications for petroleum wax. The method given here provides a basis for agreement between laboratories on the odor intensity of wax using a numerical scale rather than descriptive terms. While the method is primarily intended for rating odor intensity, results can be influenced by odor type.

5. Apparatus

5.1 *Scraper*—A knife, vegetable scraper, or other sharp instrument that can be cleaned easily. Mechanical devices that produce thin shavings from wax, such as vegetable shredders or chisel-shaped bits, may be used.

5.2 *Paper*—Odor-free paper or glassine for receiving the wax shavings.

5.3 *Bottles*, 8 oz (250 mL) wide-mouth, with caps (for alternative procedure only).

6. Test Panel

6.1 The odor test panel should consist of at least five people.

6.2 In selecting panel members for wax odor testing, the important factors to be considered are (1) agreement with the “true” rating, and (2) individual consistency. A method which may be used for checking these factors is given in the [Appendix X1](#).

NOTE 1—Any members with respiratory infection should be omitted since sensitivity may be impaired.

7. Sample and Test Specimen

7.1 The sample shall consist of a block of wax at room temperature, from which at least 100 g of shavings may be obtained.

7.2 The test specimen for evaluation by each panel member shall consist of approximately 10 g of wax in thin shavings obtained from the sample.

8. Procedure

8.1 Scrape the surface of the sample to remove any foreign material and discard those scrapings. Using a clean scraper, prepare test specimens of approximately 10 g each of wax in thin shavings, placing them on odor-free paper or glassine. Obtain shavings that represent a cross section of the sample being tested. Prepare one test specimen for each panel member.

NOTE 2—Conduct odor tests in a room as free as possible from odor. Avoid low relative humidity conditions, if possible, since it may cause difficulty in odor perception.

8.2 Each panel member shall make the odor evaluation immediately after the shavings are prepared by placing the nostrils in contact with the shavings and sniffing lightly (Note 3). An alternative procedure is permitted as follows: Immediately after preparing the shavings, transfer them to clean, odor-free bottles which are then capped. Prepare one bottle for each panel member. Each panel member shall then evaluate the test specimen between 15 min and 60 min after preparation, by removing the bottle cap, placing the nostrils at the bottle mouth and sniffing lightly.

NOTE 3—If the specimen is smelled repeatedly, the odor level will usually seem to decrease due to “olfactory fatigue” or loss of volatile components in the specimen, or both.

8.3 Record the numerical rating, as shown in Table 1, which corresponds to the odor intensity that best characterizes each specimen.

NOTE 4—Panel members should not discuss odor test results until all tests have been completed on a sample.

8.4 Individual panel members shall not evaluate a series of more than three specimens at a time. Intervals of at least 15 min between each series shall be mandatory.

TABLE 1 Odor Intensity Scale

Numerical Rating	Odor Description
0	none
1	slight
2	moderate
3	strong
4	very strong

9. Calculation

9.1 Calculate to the nearest 0.5 unit the average of the numerical ratings given to a sample by the panel members. If any of the individual ratings differ from the average by more than 1.0 unit, repeat the odor evaluation test for that sample by all panel members. If, on the second test, any individual results differ from the average by more than 1.0 unit, discard those individual results and calculate a new average.

10. Report

10.1 Report the average panel rating calculated to the nearest 0.5 unit as the odor rating of the sample by ASTM D1833.

11. Precision and Bias

11.1 *Precision*—A precision statement is being developed for this test method.

11.2 *Bias*—The procedure in this test method has no bias because the value of odor can be defined only in terms of a test method.

12. Keywords

12.1 odor; petroleum wax; wax

APPENDIX

(Nonmandatory Information)

X1. METHOD FOR SELECTING PANEL MEMBERS

X1.1 Scope

X1.1.1 Prospective panel members may be checked by this method for (1) agreement with the “true” rating, and (2) individual consistency.

X1.2 Agreement with the “True” Rating

X1.2.1 Select four wax samples that have slight but different odor intensities. (Usually 3 lb or 4 lb (1 kg or 2 kg) of each wax sample is required for the evaluation of eight or ten prospective members.) Prepare the specimens for testing as described in 8.1, and place them in an odor-free location. Each of the prospective panel members shall rate the samples alphabetically from *A* to *D* in the order of preference—best or worst. Ratings shall be made once per day until eight or ten ratings have been made on the same set of waxes. (Identify the waxes by different code numbers each day.) Individual members shall be graded against the “true” ratings of the waxes that are arrived at as follows:

4 points are given to a sample each time it appears in 1st place,

3 points are given to a sample each time it appears in 2nd place,

2 points are given to a sample each time it appears in 3rd place,

1 point is given to a sample each time it appears in 4th place.

X1.2.2 Add all points at the end of the testing program to arrive at the relative ratings of the samples, which are taken as the “true” ratings.

X1.2.3 Determine the individual grade of the prospective panel member as follows: Subtract the same number of points on each sample as the number of places it is away from its “true” rating. For example, if four waxes are found by the panel to rate in the order *A, B, C, D*, and the individual tester rates them in the order *B, C, A, D*, then his “*B*” is out of position by 1, “*C*” is out 1, “*A*” is out by 2, and “*D*” is properly placed. The

prospective panel member has missed by a total of 4 points. The greatest possible number of points accrued if his rating had been a complete reversal from the panel rating, would have been 8. The prospective member's score is therefore 50 for the one rating.

$$\text{Score} = [(R - L)/R] \times 100 \quad (\text{X1.1})$$

where:

R = points when panel order is reversed, and

L = actual points when compared to panel order.

X1.2.4 The individual's final score is the average of all his daily scores.

X1.3 Individual Consistency

X1.3.1 The individual's consistency is determined in exactly the same manner as his score as described in X1.2.3, except that his daily ratings shall be compared with his own overall average rather than the "true" rating.

X1.4 Average Score

X1.4.1 A normally competent tester should score about 70 in both "true" rating and individual consistency. Other scoring methods, however, may be used to fit particular circumstances.

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