# SURFACE VEHICLE RECOMMENDED PRACTICE

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# (R) Hot Odor Test for Materials Used in Vehicle Interior Cabins

RATIONALE

As part of a Five-Year Review, the title and scope were revised to include additional materials used in vehicle interior cabins that are compatible with the specifications of the standard. Several references including SAE J2989 were added to the standard. The minimum number of panelists increased from three to five persons, and a control sample for wet testing was described in addition to several minor revisions to the standard.

## 1. SCOPE

This test can be used to evaluate odor characteristics of non-metallic materials used in the interior cabin of a vehicle. The test conditions, odor panel requirements, scale for odor intensity and reporting of results are specified.

The data from this test are useful when compared to data obtained from samples with known odor characteristics.

## 2. REFERENCES

### 2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

#### 2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J1756 Determination of the Fogging Characteristics of Interior Automotive Materials

SAE J2989 Handling and Packaging of Materials and Components for Emissions Testing

#### 2.1.2 ISO Publications

Available from International Organization for Standardization, ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, Tel: +41 22 749 01 11, www.iso.org.

ISO/DISA 16000-30:2014 Sensory Testing of Indoor Air





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https://www.sae.org/standards/content/J1351_202205/

### 2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

#### 2.2.1 ISO Publications

Available from International Organization for Standardization, ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, Tel: +41 22 749 01 11, www.iso.org.

ISO 12219-7 Interior air of road vehicles- part 7: Odour determination in interior air of road vehicles and test chamber air of trim components by olfactory measurements

#### 2.2.2 VDA Publications

Available from German Association of the Automotive Industry (VDA), Behrenstraße 35, 10117 Berlin, www.vda.de/en.

VDA 270 Determination of the odour characteristics of trim materials used in motor vehicles

#### 2.2.3 European Standard Publications

Available from European Standard, www.en-standard.eu.

EN 13725:2003 Air quality - Determination of odour concentration by dynamic olfactometry

## 3. APPARATUS

### 3.1 Odor Test Equipment

#### 3.1.1 Glass Jars (Canning Type Jars with Metal Lids and Rings)

The volume of the jars is approximately 1.0 L or 1.0 quart. The jars must be odorless, both at room temperature and at 65 °C (149 °F). The jars have loose fitting lids and rings which can be easily opened and closed. New lids must be used for each battery of tests. Replace the rings if they become rusted or bent. Metal lids have a rubber seal that seals the lid to the glass jar. Jars are commercially available “canning” type jars.

#### 3.1.2 Oven

The oven shall be an air-circulating type and non-humidified capable of covering a temperature range of 20 to 100 °C (68 to 212 °F) and capable of maintaining a temperature of 65 °C ± 3 °C (149 °F ± 5 °F).

### 3.2 Odor Panel

To obtain consistent data, an odor panel must be carefully selected with a minimum of five panelists. Strong smokers, heavy users of aromatic cosmetics, habitual gum or tobacco users, or people with sinus problems or those with compromised sense of smell are not suitable to be a panelist. Once selected, the panel shall remain as consistent as possible when comparing samples.

The panelists shall avoid using strongly scented cosmetics, e.g., deodorants, perfumes, and/or shampoos.

Communication among panelists is not allowed.

The panel shall be as diverse as possible (e.g., ethnicity, age and gender). The number of male and female panelists should be as equal as possible. For example, two of one gender and three of the other should be used with five panelists. Distribute the panelists age as evenly as possible.

The sensory panel shall follow the requirements of ISO/DIS 16000-30, sensory testing of indoor air, 8.1.

3.3 Odor Test Room

Tests shall be conducted in an odor-free environment. Conditioned space is required (23 °C ± 2 °C (70 °F ± 2 °F) and 50% RH ± 10% RH).

4. SAMPLING, PREPARING TEST SPECIMENS, AND CONDITIONING

Samples shall be collected, handled and packaged as described in SAE J2989 and shall be representative of the material or composite being evaluated. Test specimens shall have a surface area (including all surfaces) of 250 $cm^2$ ± 25 $cm^2$ (0.28 $ft^2$ ± 0.028 $ft^2$). Test specimens can be cut to any dimension compatible to the dimensions of the jar, provided the specimen surface area is maintained at 250 $cm^2$ ± 25 $cm^2$.

For irregularly shaped materials that cannot be prepared to the specified surface area, weigh 10 grams ± 1 gram of each sample or the appropriate sample size that will fit into the jar, and record the mass to the nearest 0.1 gram. When comparing the odor to other samples, it is imperative that all samples have the same surface area or mass for consistency.

Prior to the test, the specimens shall be conditioned for 24 hours at 23 °C ± 2 °C (70 °F ± 2 °F) and 50% RH ± 10% RH.

5. PROCEDURE

5.1 Jars, lids, and rings are to be washed in accordance with the glassware cleaning procedure outlined in SAE J1756. The use of a laboratory dishwasher equivalent to the dishwasher specified in SAE J1756 is required.

5.2 Samples are to be tested dry and in the presence of moisture. For the dry test, place a test specimen in a jar and cover with the lid and ring. For the wet test, put 2 cc of distilled or deionized water directly on the specimen after the specimen has been placed in the jar and cover with the lid and ring. Keep the water in a tightly closed container and store it for no more than seven days at room temperature in an odor free and ventilated area. For the dry test, include one empty jar for control use purposes closed with a lid and ring. For the wet test, include a jar with 2 cc of distilled water for control purposes closed with a lid and ring.

5.3 Place the jars in an oven preheated to 65 °C ± 3 °C (149 °F ± 5 °F) for 1 hour (±5 minutes). This temperature was selected to be representative of automotive applications. The temperature can be modified to any temperature or set of temperatures, if agreed to by contractual parties. Note any changes to heating time or temperature in the test report.

CAUTION: Not all safety concerns related to inhalation of fumes are addressed in this standard. This test shall not be used to test materials that are known or suspected to release toxic fumes. The sample submitter must inform the test laboratory the chemical composition and any potential inhalation hazards of the materials being tested. All necessary precautions must be taken to avoid inhalation of noxious fumes.

5.4 Remove the jars after 1 hour ± 5 minutes of oven heating time. The first panelist shall position his head near the control jar (approximately 15 cm away) and remove the lid. Then, with a cupped hand, the panelist shall draw the air from the jar to their nose and slowly inhale with their nose. The panelist shall then immediately repeat the procedure for the first test specimen (dry) and record the appropriate rating listed in Section 6. Lids shall not be off the jars longer than 5 seconds ± 1 second. Tests must be conducted in a controlled environment (see 3.3) free from drafts and contaminant odors.

5.5 Wait 2 minutes ± 10 seconds and repeat 5.4 for the wet control jar and wet test specimens.

5.6 Repeat 5.4 and 5.5 for each sample.

5.7 Replace the jars in the oven for 15 minutes ± 1 minute between observers and repeat steps 5.4, 5.5, and 5.6 with at least five panelists.