



In-Vehicle Odor Evaluation Method

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This standard shall be used to determine the odor propagation of an entire vehicle when subjected to room temperature and/or elevated temperatures.

1.2 Applicability. All Passenger Vehicles.

1.3 Remarks. This specification defines the test methods for an In-Vehicle Odor Evaluation for an assembly plant site and/or in a testing chamber.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ISO 12219-7

2.2 GM Standards/Specifications.

GMW3205

3 Resources

3.1 Facilities.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.1.3 An adequate size testing chamber is required, e.g. test chamber for vehicle interior air testing; it shall be odorless and have an air flow < 0.3 m/s. The air exchange rate shall be $\geq 2/h$. The vehicle test chamber shall be capable of maintaining a temperature of $(+25 \pm 2)$ °C. The maximum background concentration for TVOC shall not exceed $200 \mu\text{g}/\text{m}^3$.

3.2 Equipment.

3.1.2 Temperature and humidity recorder: Record temperature and humidity of test environment before In-vehicle odor evaluation.

3.3 Test Vehicle/Test Piece.

Note: This specification can also be used for customer vehicles independent of the date of manufacture.

3.3.1 The vehicle should be tested within 28 days after assembly if not otherwise specified.

3.3.2 Select representative vehicles at random.

3.4 Test Time. Not applicable.

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Number of test persons: 2 to 4 persons for evaluation at assembly plant site; 4 to 6 persons for evaluation in a vehicle test chamber.

The testers shall pass the "Odor Tester Selection Procedure" (see Appendix C), and attend to trainings at regular intervals.

Persons with habitual smoking and/or excessive cosmetic use are not suitable as odor testers.

4 Procedure

4.1 Preparation. Not applicable.

4.2 Conditions.

4.2.1 Environmental Conditions.

4.2.1.1 Assembly Plant Site. Avoid any interference with the evaluation environment and record the environmental conditions during storage.

4.2.1.2 Vehicle Test chamber. The environment gas flow rate shall be ≤ 0.3 m/s and any interference with the evaluation environment shall be avoided.

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

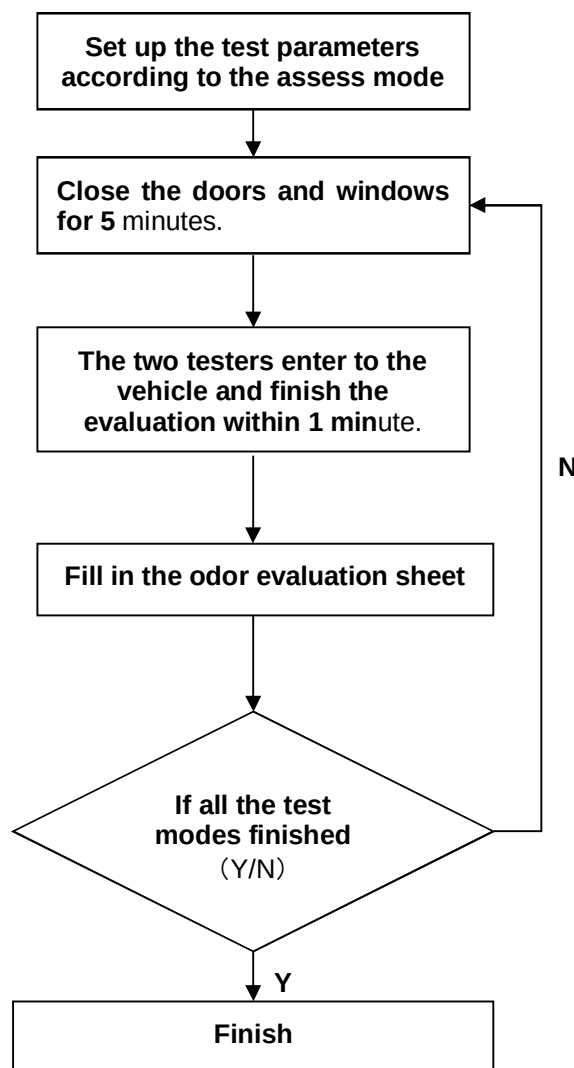
4.3.1 There are four test modes for odor evaluation: Initial Mode, Static Mode, HVAC Mode and Heating Mode. The Heating Modes are odor evaluation may not be performed at the assembly plant site. The parameters of the different test modes are shown in Table 1. The flow chart of In-vehicle odor evaluation is shown in Figure 1.

Table 1: Parameter Sheet of Different Test Modes

Test Mode		Assembly-Plant Site	Vehicle Test Chamber	Time flow
Initial Mode	Chamber Status	Not applicable	Temperature: $(+25 \pm 2.0)$ °C Humidity: (50 ± 10) %	Close doors and windows for 5 minutes
	Vehicle Status	Instant evaluation after the doors opening; 30° door opening angle. Tester outside.	Instant evaluation after the doors opening; 30° door opening angle. Tester outside.	Evaluate within 1 minute
Static Mode	Chamber Status	Not applicable	Temperature: $(+25 \pm 2.0)$ °C Humidity: (50 ± 10) %	Close doors and windows for 5 minute
	Vehicle Status	Evaluation inside the vehicle, doors closed. Tester inside.	Evaluation inside the vehicle, doors closed. Tester inside.	Evaluate within 1 minute
HVAC Mode	Chamber Status	Not applicable	Temperature: $(+25 \pm 2.0)$ °C Humidity: (50 ± 10) %	Close doors and windows for 5 minute
	Vehicle Status	Evaluation inside the vehicle, doors closed. Tester inside; Switch on the HVAC fan speed middle mode; Blow to face; Cycle mode: Recirc. & fresh mode	Evaluation inside the vehicle, doors closed. Tester inside. Switch on the HVAC fan speed middle mode; Blow to face; Cycle mode: Recirc.& fresh mode	Evaluate within 1 minute

Test Mode		Assembly-Plant Site	Vehicle Test Chamber	Time flow
Heating Mode 1	Chamber Status	Not applicable	Start the heating system	Close doors and windows and heat up the vehicle within 30 minutes, hold temperature for 15 minutes
	Vehicle Status	Not applicable	In vehicle air temperature: $(+45 \pm 5) ^\circ\text{C}$; Instant evaluation after the doors opening; 30° door opening angle. Tester outside	Evaluate within 1 minute.
Heating Mode 2	Vehicle Status	Not applicable	In vehicle air temperature: $(+45 \pm 5) ^\circ\text{C}$; Evaluation inside the vehicle, doors closed. Tester inside.	Close doors and windows for 5 minutes. Evaluate within 1 minute.

Flow Chart of In-vehicle Odor Evaluation



Note: Initial Mode and Static Mode can be completed together, enter into the vehicle to evaluate Static Mode odor immediately after completing Outside Initial Mode evaluation.

Note: Alternatively, a vehicle odor test according to ISO 12219-7 can be performed.

5 Data

5.1 Calculations. Not Applicable.

5.2 Interpretation of Results. Any odor shall be evaluated by the test persons using the classification given below. No more than half of the committee shall be chemists.