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## Interior air of road vehicles —

Part 4:

### **Method for the determination of the emissions of volatile organic compounds from vehicle interior parts and materials — Small chamber method**

*Air intérieur des véhicules routiers —*

*Partie 4: Méthode pour la détermination des émissions de composés  
organiques volatils des parties et des matériaux intérieurs des  
véhicules — Méthode de la petite chambre*



Reference number  
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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 12219-4 was prepared by Technical Committee ISO/TC 146, *Air quality*, Subcommittee SC 6, *Indoor air*, in collaboration with Technical Committee ISO/TC 22, *Road vehicles*.

ISO 12219 consists of the following parts, under the general title *Interior air of road vehicles*:

- *Part 1: Whole vehicle test chamber — Specification and method for the determination of volatile organic compounds in cabin interiors*
- *Part 2: Screening method for the determination of the emissions of volatile organic compounds from vehicle interior parts and materials — Bag method*
- *Part 3: Screening method for the determination of the emissions of volatile organic compounds from vehicle interior parts and materials — Micro-scale chamber method*
- *Part 4: Method for the determination of the emissions of volatile organic compounds from vehicle interior parts and materials — Small chamber method*
- *Part 5: Screening method for the determination of the emissions of volatile organic compounds from vehicle interior parts and materials — Static chamber method*

The following parts are under preparation:

- *Part 6: Method for the determination of the emissions of semi-volatile organic compounds from vehicle interior parts and materials — Small chamber method*
- *Part 7: Odour determination in interior air of road vehicles and test chamber air of trim components by olfactory measurements*

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## Introduction

Volatile organic compounds (VOCs) are widely used in industry and can be emitted by many everyday products and materials. They have attracted attention in recent years because of their impact on indoor air quality. After homes and workplaces, people spend a lot of time in their vehicles. It is important to determine the material emissions of interior parts and to reduce them to an acceptable level, if required. Therefore, it is necessary to obtain comprehensive and reliable information about the types of organic compounds in the interior air of vehicles and also their concentrations.

Monitoring emissions from vehicle trim components can be performed in several ways and the approach selected depends upon the desired outcome and the material type. For example, to obtain emissions data from complete assemblies (e.g. a dashboard or seat) it is necessary to employ emissions chambers or bags that have sufficient volume to house the complete assembly (typically  $\geq 4 \text{ m}^3$ ). Such tests may take several hours or even days to perform, depending on specified equilibration times and the requirements of the relevant test protocol.

This part of ISO 12219 outlines a method of measuring the types and levels of VOCs in vehicle trim components under controlled conditions using a small emission test chamber (small chamber). It describes requirements for a small chamber and a test protocol. Measurements are carried out according to ISO 16000-6 (VOCs) and ISO 16000-3 (carbonyl compounds).

The capacity of a small chamber is not limited to small assemblies or representative samples of homogeneous car trim materials. Small chambers allow qualitative and quantitative VOC emission data to be measured and recorded. The subsequent VOC emission data can be used to develop a correlation between material level methods and the vehicle level method.

This part of ISO 12219 is based on VDA 276<sup>[2]</sup> and ASTM D5116<sup>[1]</sup> and correlates to ISO 16000-9<sup>[4]</sup>

ISO 16000-3, ISO 16000-5,<sup>[3]</sup> ISO 16000-6, ISO 16000-9,<sup>[4]</sup> ISO 16000-10,<sup>[5]</sup> ISO 16000-11,<sup>[6]</sup> ISO 16000-24,<sup>[7]</sup> ISO 16000-25,<sup>[8]</sup> as well as ISO 16017-1<sup>[9]</sup> and ISO 16017-2<sup>[10]</sup> also focus on VOC measurements.