



Fraunhofer

ICT

FRAUNHOFER INSTITUTE FOR
CHEMICAL TECHNOLOGY ICT

EMISSIONS OF VOCs (VOLATILE ORGANIC COMPOUNDS)

AUTOMOTIVE/INDOOR MATERIALS AND TESTING



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AND TESTING





Emissions from plastic parts are caused by low-molecular components in the polymer matrix. These migrating components can be residual monomers from polymerization, additives, plasticizers and degradation products from processing or ageing of the part. It is particularly important to avoid or reduce these emissions in high-value products for the packaging, indoor application and medical technology sectors.



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INDOOR MATERIALS

Indoor products are generally measured in test chambers. In these chambers the emissions of volatile organic compounds (VOCs) can be analysed under defined climatic conditions (temperature, humidity, ventilation) for up to 28 days. The evaluation is performed according to the schemes of the AgBB, Afsset or other guidelines.

AUTOMOTIVE MATERIALS

Plastic compounds for the automotive industry must fulfil strict requirements regarding the product emissions. The German Association of the Automotive Industry (VDA) has published several testing methods on this topic which cover VOC-emissions, formaldehyde, fogging and odor.

ANALYSIS METHODS

An emission lab with test chambers from 20 l to 1 m³ is operated at the Fraunhofer ICT. The analyses of VOCs via a GC/MS unit is supported by online measurements with an FID and an MS system. Other parameters such as formaldehyde, ammonia or phenols can also be tested according to requirements. For a fast screening of VOC emissions the thermodesorption method VDA 278 or analyses with a thermo extractor are suitable alternatives, especially for larger sample quantities.

ODOR EVALUATION

The odor of a product has an important influence on customer satisfaction. The test methods VDA 270 (automotive materials) and ISO 16000-28 (indoor materials) can detect and evaluate extraneous or undesirable odors. The ISO 16000-28, which combines trained test persons and test chamber analyses, delivers particularly reliable results.

OUR PRODUCT AND SERVICE SPECTRUM

Automotive emission test methods available at our site include:

- VDA 276 (1 m³ emission test chamber)
- VDA 270 (odor test, accredited)
- VDA 275 (measurement of formaldehyde)
- VDA 277 (static headspace)
- VDA 278 (thermodesorption)
- DIN 75201 (fogging behaviour)
- Targeted measurement of the emission of aldehydes, ketones, phthalates, amines, aromatic compounds, overview analysis
- Company standards or specifications of different vehicle manufacturers

For indoor materials the following standard tests are performed in our labs:

- DIN EN ISO 16000-9 (AgBB, Afsset)
- DIN EN ISO 16000-28 (odor test) with a trained panel

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COVER PHOTOGRAPH:

High-class automotive interior,

Photo source: iStockphoto LP.

- 1** *Emission test of PUR-foam (1m³ chamber).*
- 2** *GC/MS coupled with thermodesorption unit.*
- 3** *Emission test in 30 l glass chamber.*
- 4** *View inside 1 m³ chamber.*