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Laborprüfung
Laboratory testing
Zertifizierung
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Abstract about VOC product emission testing acc. to EN 16516

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Regarding emission of volatile organic compounds (VOCs) from construction products, there is no harmonized European regulation on health protection: The EU Construction Products Regulation (CPR) defines basic requirements at building level but corresponding criteria for products are missing in the respective European CE-marking standards at the time being. Countries such as Germany, Belgium or France have therefore published individual regulations obliging manufacturers to subject their construction products to a VOC assessment. The European Court of Justice (ECJ) banned the German special provision for competition law reasons in 2016 which also have had influence of product emission testing requirements. The regulatory gap between CPR basic requirements and harmonized standards shall be closed with the planned European VOC assessment class concept for CE-marking according to test method EN 16516 (published 01/2018). The standard EN 16516 improves the reproducibility of VOC product emission testing with specifications of sample and laboratory demands and will be used as testing basis for voluntary test schemes and quality labels for construction products and furniture.

Introduction and legal background

The European Construction Products Regulation (CPR) stipulates that buildings and the materials used must not endanger the environment and health (Appendix I, sentence 3). In harmonized construction product standards of the EU the corresponding requirements are missing for fully record and evaluate risks that jeopardize health. In CE marking the declaration of single aspects like the formaldehyde emissions from products are requested only. Hence some EU member states implemented a national way: Germany, Belgium or France (Décret n° 2011-321) have set their own regulations for certain construction products such as floor coverings, paints, lacquers or wall and ceiling coverings. These regulations address the measurement of VOCs and contain - sometimes very different - emission assessment schemes.

Since October 2016 Germany has put an end to obligatory emissions measurement for those construction products that are also approved according to a European harmonized standard (i.e. wooden floors acc. to EN 14342). In addition to the CE mark, these may not carry the German mark of conformity (Ü mark) on the packaging any more. This is not the case with products that are not covered by the judgment: For European uncontrolled construction products which are not covered by a harmonized standard or ETA (European Technical Assessment), the Ü mark can be still required - and thus a mandatory emission measurement.

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Due to the ECJ judgment, Germany was forced to adapt its building law and developed a new pattern building code including a new administration order. This administration order "MVV TB" is in line with EU judgement but again requires VOC emissions information for some indoor air relevant construction products. The technical documentation for product emission information can be either delivered with ETAs or voluntary assessment documents from TABs (technical assessment bodies) like DIBt Germany or kiwa Netherlands. Also test reports from European notified testing bodies (like eco-INSTITUT) can be parts of technical documentation if they follow product emission technical rules acc. to EN 16516.

However different national requirements in Europe make it difficult for product manufacturers to bring products into the market across Europe and to cover all requirements with legal certainty. That's why the EU has worked for 10 years to develop the horizontal test standard for product VOC emissions EN 16516 "Construction products - Assessment of release of dangerous substances - Determination of emissions into indoor air". EN 16516 – specifying the ISO 16000 standards – shall be part of all relevant harmonized standards for construction products. The responsibility for product specification lies with the product technical committees (TCs). This determination of emission into indoor air is to be carried out on products under their intended conditions of use. EN 16516 was published 2017.

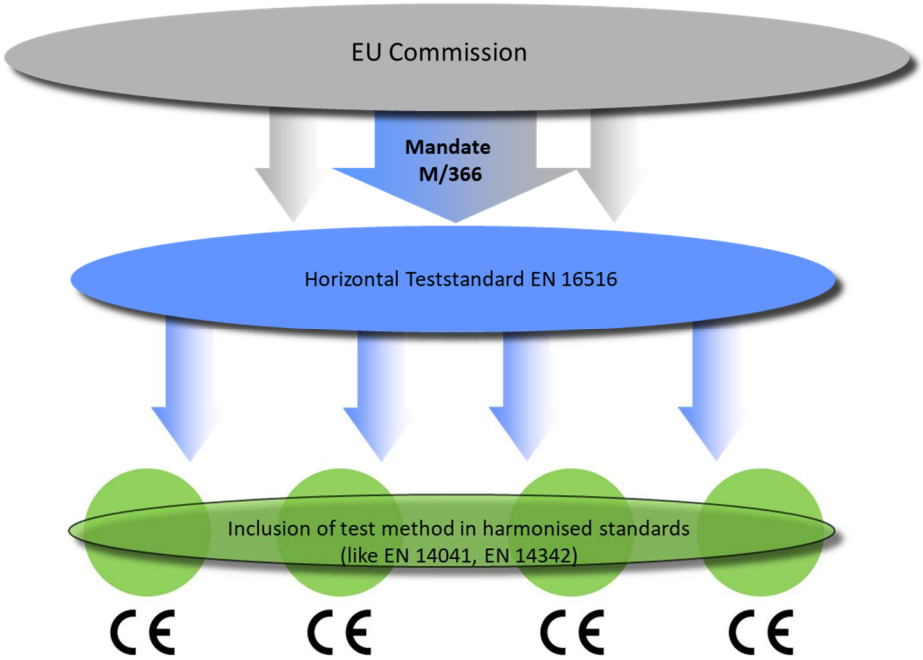

Figure 1: Implementation of EN 16516 as horizontal test method for harmonized standards (abstract)

Reference room concept of EN 16516

EN 16516 "specifies the horizontal reference method for testing the emission of dangerous substances from construction products into indoor air. This method uses a test chamber in which emissions are generated under conditions which are kept constant during the test. These conditions are selected so that the test results can be expressed in terms of concentrations of dangerous substances in the air of the reference room." (EN 16516:2017, Introduction).

In EN 16516 one reference room and one set of conditions are specified and used as conventional references for any specification of emission rates and any calculation of the related concentrations of emitted compounds in indoor air. The reference room is given as shown in figure 2.

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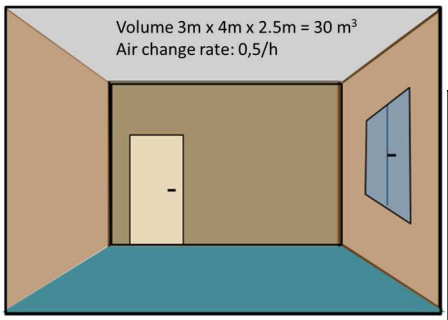


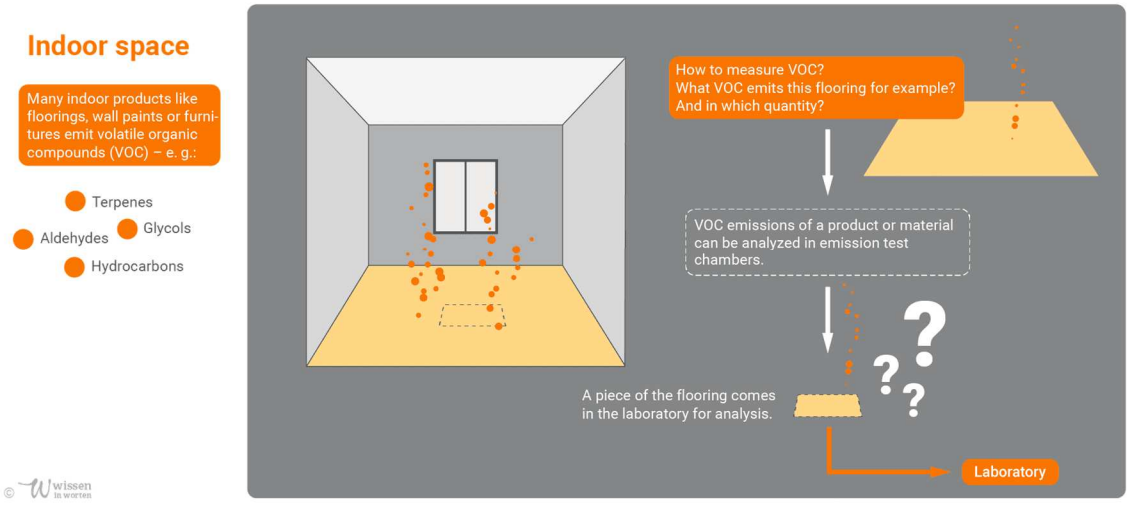
Flooring / Ceiling ~12 m²	(0,4m²/m³)
Wall ~30m²	(1m²/m³)
Joints: ~0,2 m²	(0,007m²/m³)
Door/ Window ~1,6 m²	(0,05m²/m³)

Figure 2: Dimension and loading factors in the reference room acc. to EN 16516

Using the reference room dimensions and ratios, the technical committees shall specify for harmonized product standards (like wood flooring acc. to EN 14342) depending on the product type one of the following loading factors to be used:

1,0 m²/m³ – walls;
0,4 m²/m² – floor, ceiling;
0,05 m²/m² – small surfaces, e.g. door, window, heating system;
0,007 m²/m² – very small surfaces, e.g. sealants.

Hence the reference room conditions shall be taken and adopted for product emission testing in test chambers (see Figures 3). Test chamber volume shall be at least 20 litres.



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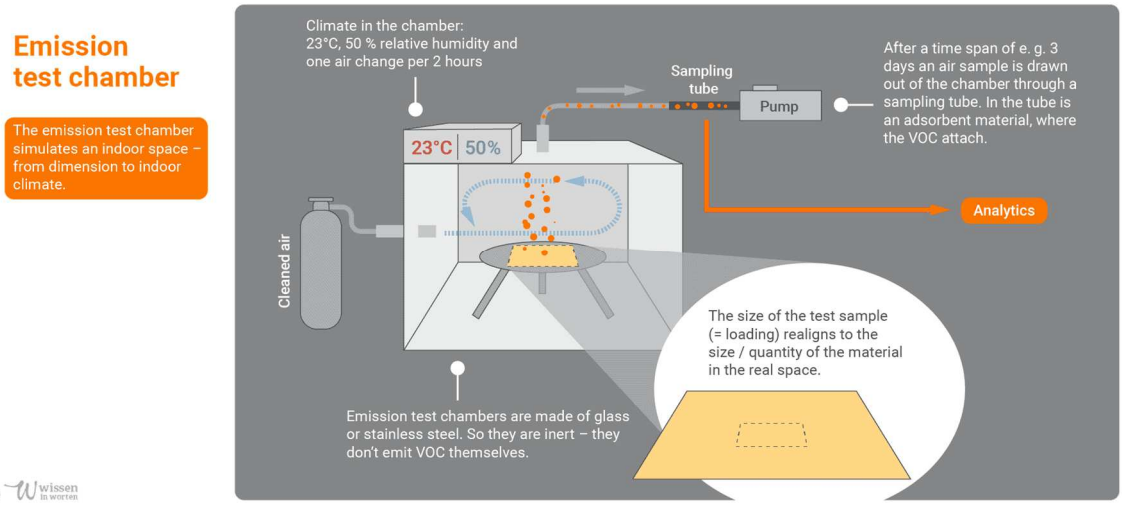

Figures 3: Principle of product emission testing acc. to EN 16516

Assessment of analytical results

VOC product emissions tested according EN 16516 procedure can be evaluated with different approaches. As Germany, France and Belgium set different evaluation schemes for regulations into account also voluntary certifications and quality marks like natureplus, Blue Angel, M1 Finland, GEV emicode or eco-INSTITUT-Label set their evaluation criteria on the EN 16516 testing basis. Currently a European VOC class concept is under development for CE-marking and integration in harmonized standards. Target for the VOC class concept is to harmonize the emissions performance declarations for products in Europe but also to simplify the information in declarations of performance for building planers and consumer.

Conclusion:

The EN 16516 published in January 2018 provides a detailed horizontal European method based on a reference room scenario concept for emissions testing of construction products in laboratory test chambers. To adopt this method in harmonized standards for the CE marking of construction products and to make meaningful declarations possible a European class concept for the assessment of VOC emissions is necessary. The EN 16516 can be and is also already specified by relevant private voluntary certification criteria like for eco-INSTITUT-label as the basis for VOC product emission testing.

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