Association for the Control of Emissions in Products for Flooring Installation, Adhesives and Building Materials (GEV)

GEV – Classification Criteria

Requirements for Emission Controlled Installation Products, Adhesives and Building Materials and Award of the EMICODE®

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1. Objective

This document specifies criteria for an evaluation of installation products, adhesives and building materials for classification with respect to long-term emissions.

2. Range of application and definitions

2.1 Installation products

Installation products are materials that are used in buildings for interior finishing mostly as plane products to prepare surfaces and to install or to glue floor, wall or ceiling coverings.

2.2 Other adhesives

Other adhesives are products that are used to glue materials and that are not specified under 2.1.

2.3 Other construction products

Other construction products are products referred to in point 2.8 that do not fall into the categories referred to in 2.1 and 2.2.

Classification criteria for products for floor surface treatments (surface coatings/lacquers for parquet, as well as lacquers, finishes and oils for mineral floorings, and lacquers for resilient floor coverings) are specified in a separate document.

2.4 Solvents

Solvents are volatile organic compounds and their mixtures with a boiling point ≤ 250 °C at standard pressure of 1013 hPa. They are liquid under normal conditions (20 °C and 1013 hPa) and are used to solve or dilute other substances without changing their chemical characteristics[1].

However, substances that meet this definition but react chemically during the curing process, thereby becoming components of the final product, are not covered by this definition of solvents.

2.5 Volatile organic compounds – terms for GEV

The definitions of EN 16516 apply to characterise volatile organic compounds that can be emitted into indoor air during normal use.

2.5.1 Volatile organic compounds - VOC

Organic compounds that are detected in the interval of *n*-hexane (*n*-C_6) to *n*-hexadecane (*n*-C_{16}) under the conditions specified in the “GEV Testing Method”.

2.5.2 Semi-volatile organic compounds - SVOC

Organic compounds that are detected after *n*-hexadecane (> *n*-C_{16}) and before *n*-docosane (*n*-C_{22}) under the conditions specified in the “GEV Testing Method”.

[1] Refer to TRGS 610 (www.baua.de/DE/Angebote/Regelwerk/TRGS/TRGS-610; document only available in German).

2.5.3 Very volatile organic compounds – VVOC

Organic compounds that are detected before *n*-hexane (< *n*-C_6) under the conditions specified in the "GEV Testing Method".

2.6 Emissions

Emissions are all volatile organic compounds that are released from installation products, adhesives and construction products into the surrounding indoor air under normal conditions. The emissions behaviour is monitored in emissions test chambers.

2.7 Emissions controlled products

Emissions controlled products fulfil the requirements as specified in clause 3.1 and 3.2.

2.8 EMICODE®

EMICODE® is a registered mark of the GEV to classify and label emissions controlled products.

The term EMICODE® is used to classify products with respect to their emissions always in combination with the applicable emissions class according to 3.2.3 as follows:

EMICODE® EC 1 PLUS:	„very low emission PLUS“
EMICODE® EC 1:	„very low emission“
EMICODE® EC 2:	„low emission“

The EMICODE® can be granted to installation products, adhesives and construction products included in the following groups:

- *Liquid products*
  Undercoats, primers, sealing primers or barrier primers, ready-to-use low-viscous tackifiers or adhesives, anti-slip coatings for self-laying floor coverings, roll-on tackifiers, spray adhesives, threadlocking adhesives, wood glues, dispersion-based additives for mineral tile mortars and levelling compounds, dispersion-based bonding courses (e. g. for bonded screeds), liquid sealants, liquid membranes, binders for synthetic resin screeds, casting resins, water-based conductive coatings, water-based synthetic resin roll-on coatings / top coats for floor coatings, reactive filler-free primers, binders for granule flooring (e.g. quartz pebble flooring)
- *Powdery products*
  Cement- and calcium sulfate-based levelling compounds, cement- or mineral-based tile mortars (Thin-bed, medium-bed or thick-bed mortars), cementitious grouts and cement-based masonry mortars, cement- and calcium sulfate-based screed mortars and screed binders, powdery and liquid screed admixtures or concrete admixtures, bonded levelling compounds/lightweight screeds, powdery adhesives (other than tile adhesives), cementitious waterproofing slurries / bonded waterproofing, powdery bonding courses (e. g. for bonded screeds), filling primers and filler primers, quick cements, repair fillers and mortars for concrete repair
- *Pasty products*
  Adhesives for flooring and parquet as well as ready-to-use adhesives for tile, assembly adhesives and other pasty adhesives, pasty tackifiers for floor coverings, dispersion-or reactive resin-based levelling compounds, waterproofing under tiles (dispersion- or

reactive resin-based products), grouts (based on dispersions or reactive resins), synthetic resin roll-on coatings / top coats for floor coatings (100 % solids content), reactive filled primers, self-levelling synthetic resin coatings for floors, liquid plastics for indoor applications

- *Ready-to-use products that do not require chemical curing or physical drying*
  Underlays (e. g. impact sound insulation underlays, insulation underlays), underlays with adhesive coating, adhesive tapes, floor installation boards, decoupling panels / insulation boards, full-surface sealing tapes and sealing collars for small surfaces (e. g. for windows and facades, in wet areas), sealing membranes for large surfaces (e.g. for walls and floors in wet areas), vapor retarders under the roof, self-adhesive window sealing strips and door seals
- *Joint sealants, joint insulations, joint sealing tapes*
  Joint sealants based on dispersions or reactive resins, assembly and insulation foams, pre-compressed joint sealing tapes according to DIN 18542 and joint sealing tapes made of foam, chemical anchors
- *Products for wall and ceiling application*
  Mineral- and gypsum-based base plasters for indoor applications, mineral- and gypsum-based finishing and top plasters for indoor applications, wall filler for thin-layer and partial applications, wall panels

3. Requirements for emissions controlled installation products, adhesives and construction products

Installation products, adhesives and construction products shall be safe in use. This includes that they must not, therefore, be hazardous to the health of installers or users and shall have the lowest possible impact on the environment by emissions. For these reasons the following requirements are specified for emissions controlled installation products, adhesives and construction products.

3.1 General requirements

3.1.1 Chemical laws

All legal regulations with regards to production, labelling and packaging must be observed during manufacture of emissions controlled installation products, adhesives and construction products.

A safety data sheet shall be prepared for emissions controlled products if required according to local law.

3.1.2 Restrictions of chemicals

3.1.2.1 Toxic products

Products (mixtures) which are classified according to European Hazardous Substances Regulation (EC) No. 1272/2008 (CLP Regulation) with regard to their toxic properties in categories 1, 2 or 3 (CLP: Part 3: 3.1 acute toxicity) are excluded from the EMICODE®.

3.1.2.2 CMR substances

CMR substances of categories 1A or 1B, shall not be actively used[2] in EMICODE® products unless

- they do not emit into indoor air[3] and
- the concentration of use does not lead to labelling of the product with the following H-phrases H340, H350, H350i, H360, H360D, H360F, H360FD, H360fd H360Df or H360Fd.

The legal limits of the CLP Regulation (Regulation (EC) No 1272/2008) apply.

3.1.2.3 SVHC substances

Substances included under the REACH Regulation (EC 1907/2006) in accordance with art. 57 in the list established under REACH art. 59(1) (the so-called "Candidate List") must not be actively used in EMICODE products[2,4], unless

- they do not emit into indoor air[3] and
- the concentration of use is below the labelling limit for hazardous substances.

At the time of application (initial application as well as licence renewal application), the current candidate list applies.

3.1.2.4 Oximes

Products (mixtures) which contain Methyl Ethyl Ketoxime (MEKO, Butanone oxime), Methyl Isobutyl Ketoxime (MIBKO) or Acetone oxime or which release them during curing are excluded from EMICODE®.

3.1.2.5 Solvents

Emission-controlled flooring installation materials, adhesives and construction products are manufactured without the additive of solvents (see point 2.4).

Solvent-free flooring installation materials, adhesives and construction products may contain a minimum solvent content (≤ 0.3 % w/w), which may result from contamination of the raw materials being used.

3.2 Requirements on emissions

Solvent-free products still may contain and release volatile organic compounds (VVOC, VOC or SVOC), parts of which are released into indoor air during application, but mainly during later occupancy.

To limit these so-called emissions, the following specifications apply to emissions controlled installation products, adhesives and construction products.

3.2.1 Volatile carcinogenic substances

A test shall show that emissions of the sum of all volatile carcinogenic organic compounds of category 1A and 1B is below 10 µg/m³ after 3 days and the emissions of any such individual VOC

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2 Due to the use of technical raw materials, however, impurities of up to 0.1 % may be detectable in each case.
3 This means they are not detectable in an emission test according to the GEV testing method.
4 So-called POP substances (persistent organic pollutants according to Regulation (EU) 2019/1021 (EU POP Regulation)) may also not be actively used in EMICODE® products. These include, for example, PBDE and DecaBDE.

are below 1 µg/m³ after 28 days. Testing shall be performed according to the separate document "GEV Testing Method".

Excluded from this requirement are defined substances classified as carcinogen 1A or 1B for which a limit value can be derived for the most sensitive endpoint at which a carcinogenic potential can no longer be assumed and for which a LCI value is derived on this basis. These substances are treated in the same way as other VOC substances with LCI values.

Deviating from the above, the following substance-specific requirements are placed on the emission behaviour of products:

- Formaldehyde (cat. 1B) and acetaldehyde (cat. 1B) after three days each not above 50 µg/m³,
- Formaldehyde (cat. 1B) after 28 days not above 10 µg/m³,
- Sum of formaldehyde and acetaldehyde after three days must not be above 0,05 ppm.

3.2.2 Volatile and semi-volatile organic compounds

Determination of volatile organic compounds that might be released from a product during a longer time period is performed as specified in the "GEV Testing Method".

Classification of a product is done on the basis of the results of that test.

Emissions are evaluated after 3 days and after 28 days.

Emissions controlled products must not exceed these maximum emissions levels:

EMICODE®	after 3 days TVOC [µg/m³]	after 28 days TVOC [µg/m³]	after 28 days TVOC / TSVOC [µg/m³]
EC 1 PLUS	≤ 750	≤ 60	≤ 40
EC 1	≤ 1000	≤ 100	≤ 50
EC 2	≤ 3000	≤ 300	≤ 100

In addition, products labelled with EMICODE® EC 1 PLUS must comply with the LCI-values and the R-value of the most recent AgBB evaluation scheme after 28 days, and with an upper limit value of 40 µg/m³ for the sum of non-assessable VOCs (VOCs without LCI-value and non-identified VOCs).

Products that are labelled with EMICODE® EC 1 must also comply with the LCI-values and the R-value of the current AgBB evaluation scheme after 28 days.

Results for acetic acid are not included in the calculation of TVOC and R value because acetic acid cannot be determined with the GEV testing method in a quantitative manner according to EN 16516[5].

[5] According to the experience of the GEV, the LCI-value of acetic acid always is respected clearly.

Compliance is given as well if all limit values for a 28 days test are respected at an earlier point in time than after 28 days, but not earlier than after 10 days, provided that there was not observed any increase of emissions compared with the results after 3 days.

4. Classification of products

4.1 Responsibility of the manufacturer

The manufacturer is responsible for determining whether and which of the above requirements a complies with. This applies in particular to changes to the labelling of components or the finished product under hazardous substances legislation and/or changes to the formulation that may lead to reclassification according to the EMICODE® system.

4.2 Testing

Testing to determine product emissions shall be carried out by a laboratory holding an accreditation in accordance with ISO 17025 that includes the "GEV Testing Method" or the EN 16516.

Documentation of the test results is performed according to the manufacturer's own internal system.

4.3 Licensing the EMICODE®

4.3.1 Application for a licence

A formal and justified application for a licence to use the EMICODE® label can be sent to the GEV if the relevant product meets the specifications of clause 3. A special form is available from the GEV and shall be used for application.

4.3.2 Awarding of the licence

After the licence is granted the product may be labelled with the EMICODE®. The word EMICODE® shall only be shown in combination with the correct emissions class. Only the GEV document "*Awarding of licence for the use of EMICODE®*" may be used for showing compliance of the product with the GEV Specifications and Classification Criteria.

4.4 Control checks

The GEV reserves the right to examine the correct classification of any licensed product. GEV follows advice from third parties on incorrect classifications and punishes these according to the sanctions that are specified in the GEV statutes.

For this purpose, GEV uses one or several independent experts who check compliance with the specifications in clause 3. An evaluation of substances as in 3.2.1 and 3.2.2 must be performed only using the analytical procedures described in the "GEV Testing Method" by an authorised laboratory.

4.5 Authorised testing laboratories

The Technical Council of the GEV decides on which testing laboratories are accepted for testing in cases of dispute and control for testing. The basic requirement is an accreditation of the chamber testing and of the involved analytical methods according to ISO 17025.

A participation in round robin tests that allow any interested laboratories to show their performance gives additional indication of qualification to the Technical Council. A current list of authorized laboratories is available at GEV's homepage www.emicode.com/en/laboratories.

5. Accompanying documents

- GEV Constitution
- GEV Testing Method
- Form Sheets: “Application for Licence” and “Awarding of Licence”

6. Changes and adaptations

The Technical Council of the GEV is responsible for setting specifications and classification criteria. Documentation and adaptation of changes is the responsibility of the GEV.