**ENVIRONMENTAL PRODUCT DECLARATION**  
as per ISO 14025 and EN 15804

<table>
<thead>
<tr>
<th>Owner of the Declaration</th>
<th>BASF Construction Chemicals Europe AG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programme holder</td>
<td>Institut Bauen und Umwelt e.V. (IBU)</td>
</tr>
<tr>
<td>Publisher</td>
<td>Institut Bauen und Umwelt e.V. (IBU)</td>
</tr>
<tr>
<td>Declaration number</td>
<td>EPD-BAS-20130086-IBE1-EN</td>
</tr>
<tr>
<td>Issue date</td>
<td>22.07.2013</td>
</tr>
<tr>
<td>Valid to</td>
<td>21.07.2018</td>
</tr>
</tbody>
</table>

**Master Builders Solutions from BASF**  
**MasterTop TC 485W**

www.bau-umwelt.com / https://epd-online.com
1. General Information

BASF Construction Chemicals Europe AG

Programme holder
IBU - Institut Bauen und Umwelt e.V.
Panoramastr. 1
D-10178 Berlin

Declaration number
EPD-BAS-20130086-IBE1-EN

This Declaration is based on the Product Category Rules:
Reaction resin products, 10-2012
(PCR tested and approved by the independent expert committee)

Issue date
22.07.2013

Valid to
21.07.2018

Owner of the Declaration
BASF Construction Chemicals Europe AG
Hardmatt 434
CH-5082 Kaisten

Declared product / Declared unit
1 kg; Density 1,25 g/cm³

Scope:
This validated Declaration entitles the holder to use the symbol of Institut Bauen und Umwelt e.V. It exclusively covers the above-named product groups of manufacturing plants in Germany for a period of five years from the date of issue. It is an association EPD, where the product displaying the highest environmental impact in a group was selected for calculating the Life Cycle Assessment. The members of the associations are shown on the association websites. The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Verification
The CEN Norm EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025

Prof. Dr.-Ing. Horst J. Bossemayer
(President of Institut Bauen und Umwelt e.V.)

Prof. Dr.-Ing. Hans-Wolf Reinhardt
(Chairman of SVA)

Matthias Schulz
(Independent tester appointed by SVA)

2. Product

2.1 Product description
MasterTop TC 485W is an epoxy resin-based reactive resin, aqueous and filled. The reactive resins are manufactured as dual-components using reactive-diluent epoxy resins and polyamines. The aqueous systems can be formulated as aqueous dispersions on the resin or curing agent side. They fulfil manifold, often specific, tasks in the construction, furnishing and refurbishment of buildings. Using epoxy resin-based reactive resins, aqueous and filled, decisively improves the usability of buildings and significantly extends their service lives. The product displaying the most environmental impacts was applied as a representative product for calculating the Life Cycle Assessment results.

2.2 Application
Application module 4: Screed material and floor screeds
MasterTop TC 485W is an aqueous 2-component sealant based on epoxy liquid resin with a matt to semi-gloss surface for direct sealing of floor screeds and concrete floors and as a topcoat in diffusible thick-layer systems.

2.3 Technical Data
Screed material and floor screeds
The minimum requirements of the EN 13813 "Screed material and floor screeds – Screed materials – Properties and requirements" must be adhered to. For synthetic resin screed, these are:
- Adhesive tensile strength (EN 13892-8): >1.5 N/mm²
- Wear resistance (EN 13892-4): < AR1
- Impact strength (EN ISO 6272): > IR4
- Fire performance (EN 13501-1): min. Efl

Other characteristics in accordance with the BASF CC Europe AG technical documents / declaration of performance / declaration of conformity

Construction data
MasterTop TC 485W complies with the requirements of EN 13813 standard in the MasterTop 1785 system.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
</table>

### 2.4 Placing on the market / Application rules

**Screed material and floor screeds**

A prerequisite for placing the product on the market and use in Germany is represented by CE marking of the products confirming conformity with DIN EN 13813 “Screed material and floor screeds – Screed materials – Properties and Requirements”. The contents of CE marking based on DIN EN 13813 must comply with the corresponding application rules in Part II of the List of Technical Building Regulations.

### 2.5 Delivery status

Liquid in containers made of tinplate appropriately prepared in separate containers for the practical mixing ratio.

Typical container sizes (retail packs) contain 10 to 25 kg material.

One metal container was analysed for the LCA.

### 2.6 Base materials / Ancillary materials

**MasterTop TC 485W epoxy resin-based reactive resin, aqueous and filled, comprises resin and curing agent components.** Aqueous, filled systems can be formulated as aqueous dispersions on the resin or curing agent side.

The resin component contains low-molecular epoxy resins based on Bisphenol-A and Bisphenol-F diglycidylether. Reactive diluents Curing takes place after installation on site and using the curing component. Viscosity is set using reactive diluents (glycidic ether) based on aliphatic alcohols. Curing takes place after installation on site and using the amino component. Polyamines and polyamine adducts based on IPD, MXDA, TMD, TEPA, for example, are used for this. The components can contain auxiliaries such as accelerators, catalysts, wetting agents, foam regulators and inert diluents (no solvents) for fine-tuning the product features (application or marketing restrictions must be adhered to).

The resin and curing agent mixing ratio is adjusted according to the stoichiometric requirements. Product curing commences directly after the components are mixed.

On average, the products covered by this EPD contain the following ranges of base materials and auxiliaries referred to:

- **Resin component:** ~ 5-50%
- **Curing agent component:** ~ 5-15%
- **Reactive diluent:** ~ 0-20%
- **Fillers:** 20-35%
- **Water:** 0-35%
- **Other:** ~ <4%

These ranges are average values and the composition of products complying with the EPD can deviate from these concentration levels in individual cases. More detailed information is available in the respective manufacturer’s documentation (e.g. product data sheets).

In individual cases, it is possible that substances on the list of materials of particularly high concern for inclusion in Annex XIV of the REACH regulation are contained in concentrations exceeding 0.1%. If this is the case, this information can be found on the respective safety data sheet.

### 2.7 Manufacture

The product components formulated are usually mixed from the ingredients in batch mode and packaged for delivery, whereby quality standards in accordance with DIN EN ISO 9001 and DIN EN ISO 14001 as well as the provisions outlined in the relevant regulations such as the Industrial Safety Regulation and Federal Pollution Control Act are adhered to.

### 2.8 Environment and health during manufacturing

As a general rule, no other environmental protection measures other than those specified by law are necessary.

### 2.9 Product processing/Installation

**MasterTop TC 485W epoxy resin-based reactive resins, aqueous and filled, are processed by trowelling/knife-coating, rolling or pouring, whereby health and safety measures (ventilation, respiratory equipment) are to be taken and consistently adhered to in accordance with the information on the safety data sheet and conditions on site.**

On account of its composition, the MasterTop TC 485W epoxy-resin product, aqueous and filled, is generally allocated to the GISBAU product code RE 2.

### 2.10 Packaging

Empty containers and clean foils can be recycled. Wooden reusable pallets are taken back by the building material trade (reusable pallets remunerated in the German deposit system) which returns them to the building product manufacturer who in turn redirects them into the production process.

### 2.11 Condition of use

During the use phase, epoxy resin-based reactive resins, aqueous and filled, are cured and essentially comprise an inert three-dimensional network. They are long-lasting products which protect our buildings in the form of adhesives, coatings or sealants as well as making an essential contribution towards their function and conservation of value.

### 2.12 Environment and health during use

**Option 1 – Products for applications outside recreation areas**

During use, epoxy resin-based reactive resins, aqueous and filled, lose their reactive capacity and are inert.

No risks are known for water, air and soil if the products are used as designated.

**Option 2 – Products for applications in recreation areas**

Not applicable

### 2.13 Reference service life

Epoxy resin-based reactive resins, aqueous and filled, comply with a variety of often special tasks in the construction or refurbishment of building structures. They decisively improve the usability of building structures and significantly extend their original service lives. The anticipated reference service life depends on the specific installation situation and the exposure associated with the product. It can be influenced by weathering as well as mechanical or chemical loads.
2.14 Extraordinary effects

Fire

Even without any special fire safety features, epoxy resin-based reactive resins, aqueous and filled, comply with at least the requirements of DIN EN 13501-1 standard for fire classes E and Efl. In terms of the volumes applied, they only have a subordinate influence on the fire performance characteristics of the building structure in which they are installed. As networked epoxy resins involve a duroplastic plastic which does not melt or drip, the resins do not contribute towards spreading fire. On the other hand, the flammability of the networked epoxy resins is greater than that of other duroplastics. Formaldehyde and phenols, for example, can form in the event of a fire.

Fire protection
In accordance with the Commission Decision 2010/85/EU dated 09.02.2010, the product complies with fire class E/Efl without requiring any testing.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building material class</td>
<td>Efl</td>
</tr>
</tbody>
</table>

Water
Epoxy resin-based reactive resins, aqueous and filled, are chemically inert and insoluble in water. They are often used to protect building structures from harmful water ingress / the effects of flooding.

Mechanical destruction
The mechanical destruction of epoxy resin-based reactive resins does not lead to any decomposition products which are harmful for the environment or health.

2.15 Re-use phase
According to present knowledge, no environmentally-hazardous effects in terms of landfilling are to be generally anticipated through dismantling and recycling components to which hardened epoxy resin products adhere.

2.16 Disposal
Individual components which can no longer be recycled must be combined at a specified ratio and hardened.
Hardened product residue is not special waste.
Non-hardened product residue is special waste.
Empty, dried containers (free of drops and scraped clean) are directed to the recycling process.
Residue must be directed to proper waste disposal taking consideration of local guidelines.

The following EWC/AVV waste codes can apply:

Hardened product residue:
080112 Paint and varnish waste with the exception of those covered by 08 01 11
080410 Adhesive and sealant compound waste with the exception of those covered by 08 04 09

Used sheet metal packaging can be returned through one of the 300 KBS deposit points. For further information, please contact:
KBS GmbH Düsseldorf
+49 (0)211 239 228 10
www.kbs-recycling.de

2.17 Further information
More information is available in the product or safety data sheets of BASF CC Europe AG and is available on the www.master-builders-solutions.basf.co.uk website or on request. Valuable technical information is also available on the associations’ websites. Information on Deutsche Bauchemie, for example, is available at www.deutsche-bauchemie.de.

3. LCA: Calculation rules

3.1 Declared Unit
The association EPD refers to the declared unit of 1 kg reactive resin product in the mixing ratio required for processing both components. Consumption per unit area of MasterTop TC 485W to be applied extensively can range between 150 grams and 250 grams per square metre.
An LCA for solvent-free, highly-filled and aqueous reactive resin products was calculated in this EPD. The product with the highest environmental impact in the product group was declared.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declared unit</td>
<td>1</td>
<td>kg</td>
</tr>
<tr>
<td>Conversion factor to 1 kg</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

3.2 System boundary
The LCA takes consideration of Modules A1/A2/A3, A4, A5 and D:
- A4 Transport to the construction site
- A5 Installation (disposal of packaging and emissions during installation)
- D Credits from incineration of packaging materials and recycling the metal container
This therefore involves a Declaration from the “cradle to plant gate with options”.

3.3 Estimates and assumptions
Where no specific GaBi processes were available, the individual recipe ingredients of formulae were estimated on the basis of information provided by the manufacturer or literary sources.

3.4 Cut-off criteria
No cut-off criteria were applied for calculating the LCA. All raw materials submitted by the associations for the formulae were taken into consideration. The manufacture of machinery, plants and other infrastructure required for production of the products under review was not taken into consideration in the LCA.
3.5 Background data
Data from the GaBi 5 data base was used as background data. Where no background data was available, it was supplemented by manufacturer information and literary research.

3.6 Data quality
Representative products were applied for this sample EPD and the product in a group displaying the highest environmental impact was applied for calculating the LCA results. The data records are no more than 7 years old.

3.7 Period under review
The review period concerns annual production for the year 2011.

3.8 Allocation
No allocations were applied for production. A multi-input allocation with a credit for electricity and thermal energy was used for incineration of packaging in accordance with the simple credit method. The credits achieved through packaging disposal are offset in Module D.

3.9 Comparability
Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to EN 15804 and the building context, respectively the product-specific characteristics of performance, are taken into account. In this case, 1 kg reactive resin was selected as the declared unit. Depending on the application, a corresponding conversion factor such as the specific unit area must be taken into consideration.

4. LCA: Scenarios and additional technical information
The following technical information forms the basis for the declared modules or can be used for developing specific scenarios in the context of a building evaluation if modules are not declared (MND).

<table>
<thead>
<tr>
<th>Transport to site (A4)</th>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Litres of fuel</td>
<td>0.00248</td>
<td>l/100km</td>
<td></td>
</tr>
<tr>
<td>Transport distance</td>
<td>500</td>
<td>km</td>
<td></td>
</tr>
<tr>
<td>Capacity utilisation (including empty runs)</td>
<td>85</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Gross density of products transported</td>
<td>1250</td>
<td>kg/m³</td>
<td></td>
</tr>
<tr>
<td>Capacity utilisation volume factor</td>
<td>100</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Construction installation process (A5)</th>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material loss</td>
<td>0.01</td>
<td>kg</td>
<td></td>
</tr>
<tr>
<td>VOC in the air</td>
<td>0.02</td>
<td>kg</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reference service life</th>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference service life</td>
<td>40</td>
<td>a</td>
<td></td>
</tr>
</tbody>
</table>
5. LCA: Results

**DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)**

<table>
<thead>
<tr>
<th>PRODUCT STAGE</th>
<th>CONSTRUCTION STAGE</th>
<th>USE STAGE</th>
<th>END OF LIFE STAGE</th>
<th>BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw material</td>
<td>A1</td>
<td>A2</td>
<td>A3</td>
<td>A4</td>
</tr>
<tr>
<td>Transport</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: MasterTop TC 485W, 1KG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A4</th>
<th>A5</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global warming potential</td>
<td>[kg CO₂-eq.]</td>
<td>2.66E+0</td>
<td>2.51E-2</td>
<td>9.06E-2</td>
<td>-1.57E-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depletion potential of the stratospheric ozone layer</td>
<td>[kg CFC11-eq.]</td>
<td>3.46E-6</td>
<td>1.35E-12</td>
<td>3.84E-12</td>
<td>-6.07E-11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acidification potential of land and water</td>
<td>[kg SO₂-eq.]</td>
<td>5.11E-3</td>
<td>1.56E-4</td>
<td>1.29E-5</td>
<td>-4.91E-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eutrophication potential</td>
<td>[kg POP²-eq.]</td>
<td>5.64E-4</td>
<td>3.98E-5</td>
<td>2.51E-6</td>
<td>-1.05E-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formation potential of tropospheric ozone photochemical oxidants</td>
<td>[kg Ethene-eq.]</td>
<td>1.26E-3</td>
<td>4.85E-5</td>
<td>7.22E-3</td>
<td>-7.92E-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abiotic depletion potential for non fossil resources</td>
<td>[kg Sb-eq.]</td>
<td>1.10E-6</td>
<td>1.15E-9</td>
<td>1.64E-9</td>
<td>-8.81E-9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abiotic depletion potential for fossil resources</td>
<td>[MJ]</td>
<td>6.78E+1</td>
<td>3.47E-1</td>
<td>2.55E-2</td>
<td>-1.93E+0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**RESULTS OF THE LCA - RESOURCE USE: MasterTop TC 485W, 1KG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A4</th>
<th>A5</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable primary energy as energy carrier</td>
<td>[MJ]</td>
<td>2.22E+0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Renewable primary energy resources as material utilization</td>
<td>[MJ]</td>
<td>7.30E-1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total use of renewable primary energy resources</td>
<td>[MJ]</td>
<td>2.93E+0</td>
<td>1.38E-2</td>
<td>1.87E-3</td>
<td>-3.41E-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non renewable primary energy as energy carrier</td>
<td>[MJ]</td>
<td>4.59E+1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Non renewable primary energy as material utilization</td>
<td>[MJ]</td>
<td>2.27E+1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total use of non renewable primary energy resources</td>
<td>[MJ]</td>
<td>6.85E+1</td>
<td>3.47E-1</td>
<td>2.55E-2</td>
<td>-1.93E+0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of secondary material</td>
<td>[kg]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Use of renewable secondary fuels</td>
<td>[MJ]</td>
<td>3.83E-4</td>
<td>2.94E-6</td>
<td>3.48E-7</td>
<td>1.44E-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of non renewable secondary fuels</td>
<td>[MJ]</td>
<td>4.90E-3</td>
<td>3.06E-6</td>
<td>3.64E-6</td>
<td>1.51E-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of net fresh water</td>
<td>[m³]</td>
<td>8.45E-4</td>
<td>1.29E-3</td>
<td>2.13E-3</td>
<td>-2.07E-2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: MasterTop TC 485W, 1KG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A4</th>
<th>A5</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous waste disposed</td>
<td>[kg]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Non-hazardous waste disposed</td>
<td>[kg]</td>
<td>2.87E+0</td>
<td>1.83E-3</td>
<td>7.73E-2</td>
<td>-9.63E-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radioactive waste disposed</td>
<td>[kg]</td>
<td>8.99E-4</td>
<td>4.90E-7</td>
<td>1.30E-6</td>
<td>-3.57E-6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Components for re-use</td>
<td>[kg]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Materials for recycling</td>
<td>[kg]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Materials for energy recovery</td>
<td>[kg]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Exported electrical energy</td>
<td>[MJ]</td>
<td>-</td>
<td>-</td>
<td>1.11E-1</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Exported thermal energy</td>
<td>[MJ]</td>
<td>-</td>
<td>-</td>
<td>2.69E-1</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

"Hazardous waste for disposal" indicator: No Declaration in accordance with the Expert Committee (SVA) decision of 4.10.2012

**Use of fresh water resources (FW)**

Evidence of the use of fresh water resources indicator (FW) is provided on the basis of a standard definition in accordance with DIN EN 15804. The IBU Expert Committee (SVA) amended the definition of FW at its last meeting on 4 October 2012. FW can however be fully evaluated at this point in time and in accordance with this new definition.

**Hazardous waste for disposal (HWD)**

The IBU Expert Committee (SVA) clearly defined the calculation rules for declaring waste at its last meeting on 4 October 2012. The data on which the background data is based must therefore be revised. This Environmental Product Declaration complies with the interim solution approved by the SVA and is drawn up without a declaration of hazardous and non-hazardous waste.

6. LCA: Interpretation

Most of the non-renewable primary energy requirements are necessitated by manufacture of the preliminary products as they almost exclusively involve preliminary products from fossil raw materials which generally incur energy-intensive manufacturing. The most prevalent energy carriers used are therefore natural gas and crude oil, whereby more than 95% of the non-renewable primary energy is required for manufacturing the preliminary products (A1).
Amine components in particular are associated with very energy-intensive manufacturing while the resin components have fewer effects on primary energy requirements. The percentage of renewable primary energy is disproportionately low. A1 indicates the renewable share of the power mix, whereby the use of wooden pallets in packaging has the main impact in A3. Solar energy is required for photosynthesis during wood growth which is therefore noted here as a renewable source of primary energy.

The Global Warming Potential (GWP) is dominated by preliminary product manufacturing (A1). Production of the actual epoxy resin product also has a visible influence which is attributable to the energy required. Packaging is incinerated during installation with the result that the ensuing emissions also have an influence on the GWP. The credits in Module D are primarily necessitated by the credit for redirecting sheet metal containers to the recycling process and less by the electricity and thermal energy incurred while incinerating the packaging. The GWP is dominated by carbon dioxide emissions (85-90%).

In terms of the Ozone Depletion Potential (ODP), it is apparent that the influences are almost exclusively necessitated by A1 and A3 primarily originating from halogenated organic emissions from the power mix used.

7. Requisite evidence

7.1 VOC
Special tests and evidence have not been carried out or provided within the framework of drawing up this sample Environmental Product Declaration. Where the products are used in an area of application (e.g. recreation area) demanding testing/provision of VOC emissions in the recreation area, such evidence should always be submitted in the individual EPDs. Evidence pertaining to VOC can be listed for selected products or applications (e.g. recreation area). The following limit values apply (maximum values in [µg/m³]):

<table>
<thead>
<tr>
<th>Classification / EMICODE</th>
<th>EC1 PLUS</th>
<th>EC1</th>
<th>EC2</th>
<th>RAL UZ 113</th>
<th>DBT/AgBB</th>
</tr>
</thead>
<tbody>
<tr>
<td>TVOC (C6-C16) (after 3/28 d)</td>
<td>750/60</td>
<td>1000/100</td>
<td>3000/300</td>
<td>1000/100</td>
<td>10000/1000</td>
</tr>
<tr>
<td>TSVOC (C18-C22) (after 28 d)</td>
<td>40</td>
<td>50</td>
<td>100</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>C1, C2 substances * Total after 3 d ** per substance after 28 d</td>
<td>10/1</td>
<td>10/1</td>
<td>10/1</td>
<td>10/1</td>
<td>10/1</td>
</tr>
<tr>
<td>Total formaldehyde / acetaldehyde [ppb] (after 3 d)</td>
<td>50/50</td>
<td>50/50</td>
<td>50/50</td>
<td>50/50</td>
<td>/</td>
</tr>
<tr>
<td>Total VOC without NIK and unidentified substances (after 28 d)</td>
<td>40</td>
<td>-</td>
<td>-</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>R-value (after 28d)</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

(* e.g. for flooring adhesives or for other dispersion-based products, other RAL UZ can be of relevance.

Measuring process: GEV test method for determining the emissions of volatile organic compounds from building products in accordance with DIN EN ISO 16000 Parts 3, 6, 9 and 11 in a test chamber. Testing for CMR substances and TVOC/TSVOC after 3 and 28 days.

The corresponding test certificate (e.g. EMICODE licence, Blue Angel as per RAL 113) shall apply as evidence. If necessary, the results are to be provided in the form of the emission class.

VOC emissions
MasterTop TC 485W is not intended for use in public buildings but, on the basis of the French regulation governing emissions applicable as of September 2013, has been tested and awarded A+ classification.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>TVOC (C6 - C16)</td>
<td>&lt; 10</td>
<td>µg/m³</td>
</tr>
</tbody>
</table>

8. References

Institut Bauen und Umwelt 2011

Institut Bauen und Umwelt e.V., Königswinter (pub.):
Generation of Environmental Product Declarations (EPDs):

**General principles**
for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2011-09
www.bau-umwelt.de

**PCR 2011, Part A**
Institut Bauen und Umwelt e.V., Königswinter (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. September 2012
www.bau-umwelt.de

**ISO 14025**
DIN EN ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

**EN 15804**
EN 15804:2012-04: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

**PCR 2011, Part B:** Product Category Rules for Building Products, Part B: Requirements on the EPD for reactive resin products, 2011-06
https://epd-online.com

**DIN EN ISO 9001:**2008-12, Quality management systems - Requirements (ISO 9001:2008); trilingual version EN ISO 9001:2008

**DIN EN 1504-2:** 2005-01 Products and systems for the protection and repair of concrete structures — Definitions, requirements, quality monitoring and evaluation of conformity — Part 2: Surface protection systems for concrete; German version EN 1504-2:2004

**DIN EN 1504-3:** 2006-03 Products and systems for the protection and repair of concrete structures — Definitions, requirements, quality monitoring and evaluation of conformity — Part 3: Structural and non-structural repair; German version EN 1504-3:2005

**DIN EN 13813:** 2003-01 Screed material and floor screeds — Screed materials — Properties and requirements

**ETAG 005:** 2005-02 Guideline for European Technical Approval of liquid-applied roof waterproofing kits, Part 1: General (ETAG 005); edition 2000-03; revision 2004-03

**ETAG 022:** 2007-07 Waterproofing for wet room walls and floors — Part 1: Liquid-applied coverings with or without wearing surface

**ETAG 033:** 2010-09 Liquid-applied coverings for concrete bridges


**DIN CEN/TS 15717:** 2008-07 Parquet flooring — General guideline for installation; German version CEN/TS 15717:2008

**DIN EN 1062-3:** 2008-04 Paints and varnishes — Coating materials and coating systems for exterior masonry and concrete — Part 3: Determination of water permeability; German version EN 1062-3:2008

**DIN EN 1062-6:** 2002-10 Paints and varnishes — Coating materials and coating systems for exterior masonry and concrete — Part 6: Determination of carbon dioxide permeability; German version EN 1062-6:2002

**DIN EN ISO 7783:** 2012-02 Paints and varnishes — Determination of water-vapour transmission properties — Cup method (ISO 7783:2011); German version EN ISO 7783:2011

**DIN EN 1542:** 1999-07 Products and systems for the protection and repair of concrete structures — Test methods — Measurement of bond strength by pull-off; German version EN 1542:1999

**DIN EN 1771:** 2004-11 Products and systems for the protection and repair of concrete structures — Test methods — Determination of injectability and splitting test; German version EN 1771:2004

**DIN EN ISO 3219:** 1994-10 Plastics — Polymers/Resins in liquid state or as emulsions or dispersions — Determination of viscosity using a rotational viscometer with defined shear rate (ISO 3219:1993); German version EN ISO 3219:1994

**DIN EN ISO 9514:** 2005-07 Paints and varnishes — Determination of the pot life of multi-component coating systems — Preparation and conditioning of samples and guidelines for testing (ISO 9514:2005); German version EN ISO 9514:2005

**DIN EN 13892-8:** 2003-02 Test methods for screed materials — Part 8: Determination of bond strength; German version EN 13892-8:2002

**DIN EN 13501-1:** 2010-01 Classification of Building Products and Types by Fire Performance — Part 1: Classification with the results of tests on fire performance by building products; German version EN 13501-1:2007+A1:2009


**DIN EN ISO 1522:** 2007-04 Paints and varnishes — Pendulum damping test (ISO 1522:2006); German version EN ISO 1522:2006
DIN EN 12190: 1998-12
Products and systems for the protection and repair of concrete structures – Test methods – Determination of compressive strength of repair mortar; German version EN 12190:1998

DIN EN 1015-17: 2005-01
Test methods for mortar for masonry – Part 17: Determination of water-soluble chloride content of fresh mortars; German version EN 1015-17:2000 + A1:2004

DIN EN 12004: 2012-09

DIN EN 12003: 2009-01
Adhesive for tiles – Determination of shear adhesion strength of reactive resin adhesives; German version EN 12003:2008

DIN EN 1346: 2007-11
Adhesive for tiles – Determination of open time; German version EN 1346:2007

AgBB
German Committee for Health-Related Evaluation of Building Products Health-related evaluation of emissions by volatile organic compounds (VOC and SVOC) from building products; status: June 2012
www.umweltbundesamt.de/produkte/bauprodukte/agb.html

EMICODE

GEV – Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e. V. (pub.)
www.emicode.de

GaBi 5 software & documentation
Data base for comprehensive analysis LBP, University of Stuttgart and PE International, Documentation of the GaBi data, 2012
http://documentation.gabi-software.com/

GISBAU
Hazardous Substances Information System of the employers’ liability insurance associations for the building trade
www.gisbau.de

REACH

ZTV ING Part 7
Bundesanstalt für Straßenwesen (pub.): Additional technical terms of contract and guidelines for civil engineering works (ZTV-ING) – Part 7 Bridge surfaces, section 3: Bridge surfaces on concrete with a sealing layer made of liquid plastic; status: 01/03
<table>
<thead>
<tr>
<th>Role</th>
<th>Details</th>
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</table>
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