

# ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	<b>BASF Construction Chemicals Europe AG</b>
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-BAS-20130093-IBE1-EN
Issue date	22.07.2013
Valid to	21.07.2018

Master Builders Solutions from BASF

**MasterTop BC 325N**

**MasterTop BC 325NFLR**

**MasterTop BC 327FLR**

**MasterTop BC 361N**

**MasterTop BC 375N**

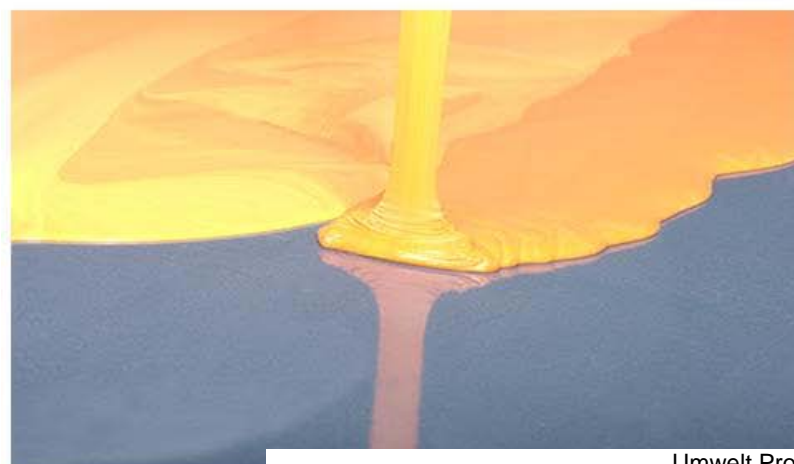
**MasterTop BC 375NAS**

[www.bau-umwelt.com](http://www.bau-umwelt.com) / <https://epd-online.com>



Institut Bauen  
und Umwelt e.V.

  
The Chemical Company



## 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-20130093-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



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



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

### MasterTop BC 325N MasterTop BC 325NFLR MasterTop BC 327FLR MasterTop BC 361N MasterTop BC 375N MasterTop BC 375NAS

#### Owner of the Declaration

BASF Construction Chemicals Europe AG  
Industriestrasse 26  
CH-8207 Schaffhausen

#### Declared product / Declared unit

1 kg filled, solvent-free polyurethane-based reactive resin;  
density: 1.00 -1.45 g/cm<sup>3</sup>

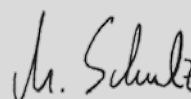
#### Scope:

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

internally  externally



Matthias Schulz  
(Independent tester appointed by SVA)

## 2. Product

### 2.1 Product description

*Polyurethane-based reactive resins, filled and solvent-free*

The MasterTop BC 325N, MasterTop BC 325NFLR, MasterTop BC 327FLR, MasterTop BC 361N, MasterTop BC 375N and MasterTop BC 375NAS reactive resins are manufactured as single or dual components using polyols (based on mineral oils or from renewable raw materials) and isocyanates. The products fulfil manifold, often specific, tasks in the construction, furnishing and refurbishment of buildings. Using filled and solvent-free polyurethane-based reactive resins decisively improves the usability of buildings and 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

These filled and solvent-free polyurethane-based reactive resins are used for the following applications:  
*Application module 4: Screed material and floor screeds.*

MasterTop BC 325N, MasterTop BC 325NFLR, MasterTop BC 361N, MasterTop BC 375N and MasterTop BC 375NAS are 2-component polyurethane flow coatings - pigmented, solvent-free, filled with high colour intensity, low-emission - for use in flooring constructions.

MasterTop BC 327FLR is a 2-component polyurethane solid underlayer – solvent-free and low-emission (AgBB-conformant), resilient, pigmented and impact sound-reduced – for use in flooring constructions.

## 2.3 Technical Data

### *Screed material and floor screeds*

The minimum requirements of EN 13813:2003-01 "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/mm<sup>2</sup>
- Wear resistance (EN 13892-4): < AR1
- Impact strength (EN ISO 6272): > IR4
- Fire performance (EN 13501-1): min. Efl

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

### Construction data

MasterTop BC 325N, MasterTop BC 325NFLR, MasterTop BC 327FLR, MasterTop BC 361N, MasterTop BC 375N and MasterTop BC 375NAS comply with the requirements of the EN 13813 standard in the corresponding MasterTop 1324, MasterTop 1325, MasterTop 1325REGFLR, MasterTop 1326, MasterTop 1327FLR and MasterTop 1328AS system designs.

Name	Value	Unit
Density	1000 - 1450	kg/m <sup>3</sup>
Tensile bond strength nach DIN EN 14293	> 1,5	N/mm <sup>2</sup>
Wear resistance EN 13892-4	< AR1	
Impact strength EN ISO 6272	> IR4	
Fire behavior EN 13501-1	Bfl-s1	

## 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.

The legal basis for this is represented by Council Guideline 89/106/EEC until 30 June 2013 and the European Parliament and Council Directive (EU) No. 305/2011 (ABl. I 88/5 dated 4.4.2011) as of 1 July 2013 with the respective implementation specifications in national law. Building products placed on the market prior to 01.07.2013 which comply with Guideline 89/106/EEC are regarded as being conformant with Directive (EU) No. 305/2011.

CE marking in accordance with Guideline 89/106/EEC means that the manufacturer declares conformity of the product with the technical specification. This is DIN EN 13813 "Screed material and floor screeds – Screed materials – Properties and requirements".

CE marking in accordance with Directive (EU) No. 305/2011 means that the manufacturer declares conformity of the product with its declared performance.

As for the rest, the provisions outlined in Part II of the List of Technical Building Regulations shall apply.

## 2.5 Delivery status

Liquid or pasty in containers made of tinfoil appropriately prepared in separate containers for the practical mixing ratio.

MasterTop BC 325N, MasterTop BC 325NFLR, MasterTop BC 375N and MasterTop BC 375NAS are sold as 30-kg kits (Part A + Part B).

MasterTop BC 327FLR is sold as 25-kg kits (Part A + Part B).

MasterTop BC 361N is sold as 13-kg and 26-kg kits (Part A + Part B).

## 2.6 Base materials / Ancillary materials

MasterTop BC 325N, MasterTop BC 325NFLR, MasterTop BC 327FLR, MasterTop BC 361N, MasterTop BC 375N and MasterTop BC 375NAS dual-component polyurethane-based reactive resins, filled and solvent-free, comprise a resin component and a curing agent component. The resin component contains polyether and/or polyester polyols (based on mineral oils or from renewable raw materials) as well as inert mineral fillers (e.g. chalk). Curing takes place after installation on site and using the curing component. This involves the use of homologues, pre-polymers and polymers based on MDI, HDI or IPDI. The components may contain auxiliaries such as accelerators, catalysts, wetting agents, foam regulators and viscosity regulators for fine adjustment of the product characteristics (application or marketing restrictions must be observed).

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: up to approx. 80%

Curing agent component: up to approx. 40%

Plasticisers: ~ 0-25 %

Fillers: ~ 0-65 %

Additives/Pigments: ~ 0-30 %

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 from BASF Construction Chemicals Europe AG (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 filled into the container, whereby quality and environmental standards in accordance with DIN EN ISO 9001:2008-12 and DIN EN ISO 14001 as well as the provisions outlined in the relevant regulations such as the Industrial Safety Regulation or 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 BC 325N, MasterTop BC 325NFLR, MasterTop BC 327FLR, MasterTop BC 361N, MasterTop BC 375N and MasterTop BC 375NAS polyurethane-based reactive resins, filled and solvent-free, are processed by trowelling/knife-coating and/or de-aerating rollers, during which possible health and safety measures (ventilation, respiratory protection devices) are to be taken and consistently adhered to in accordance with the information on the safety data sheet and conditions on site.

MasterTop BC 325N, MasterTop BC 325NFLR, MasterTop BC 327FLR, MasterTop BC 361N, MasterTop BC 375N and MasterTop BC 375NASS solvent-free polyurethane products bear the PU 40 GISCODE/Gisbau product code on account of their composition.

## 2.10 Packaging

A detailed description of packaging is outlined in section 2.5. 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, filled and solvent-free polyurethane-based reactive resins are hardened and essentially comprise an inert three-dimensional network.

They are long-lasting products which are used in buildings in the form of adhesives, coatings or sealants as well as contributing towards their function and conservation of value.

## 2.12 Environment and health during use

### Option 1

#### **Products for applications outside recreation areas**

During use, filled and solvent-free polyurethane-based reactive resins have lost their reactive capacity making them 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**

When used in recreation areas, evidence emission performance of building products in contact with indoor air must be submitted. MasterTop BC 325N, MasterTop BC 325NFLR, MasterTop BC 327FLR, MasterTop BC 361N, MasterTop BC 375N and MasterTop BC 375NAS comply with the following test schemes in the MasterTop1324, MasterTop1325, MasterTop1325REGFLR, MasterTop 1326, MasterTop 1327FLR and MasterTop 1328AS system designs: AgBB VOC scheme, AFSSET VOC scheme and A+ VOC Directive. No further influences by emissions on the environment and health are known.

## 2.13 Reference service life

Filled and solvent-free polyurethane-based reactive resins fulfil 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, polyurethane-based reactive resins 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. Networked polyurethane resins do not melt or drip with the result that they do not contribute to the spreading of fire.

### Fire protection

MASTERTOP BC 325 N, MASTERTOP BC 325 N FL, MASTERTOP BC 327 FL, MASTERTOP BC 361 N, MASTERTOP BC 375 N and MASTERTOP BC 375 N AS have achieved fire classification Bfl-s1 in accordance with EN 13501-1 (incl. testing in the MASTERTOP 1324, MASTERTOP 1325, MASTERTOP 1325 REG FL, MASTERTOP 1326, MASTERTOP 1327 FL and MASTERTOP 1328 AS system build-ups).

Name	Value
Building material class	Bfl
Smoke gas development	s1

### Water

Filled and solvent-free polyurethane-based reactive resins 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 polyurethane-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 polyurethanes adhere. If polyurethane systems can be removed from the components at no great effort, thermal recycling on account of their energy content represents a practical re-use variant.

## 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](http://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 are available on the [www.master-builders-solutions.basf.co.uk](http://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](http://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.  
The unit area of MasterTop BC 325N, MasterTop BC 325NFLR and MasterTop BC 361N applied extensively is approx. 2.5 kg per m<sup>2</sup>.  
The unit area of MasterTop BC 327FLR applied comprehensively ranges between 3.2 kg and 3.7 kg per square metre.  
The unit area of MasterTop BC 375N ranges between 1.8 kg and 2.8 kg per square metre.  
The unit area of MasterTop BC 375NFLR ranges between 2.0 kg and 2.5 kg per square metre.  
An LCA for filled and solvent-free polyurethane-based reactive resin products was calculated in this EPD.  
The product with the highest environmental impact in the product groups was declared.

**Declared unit**

Name	Value	Unit
Declared unit	1	kg
Conversion factor to 1 kg	1	-

**3.2 System boundary**

The LCA takes consideration of Modules A1/A2/A3, A4, A5 and D:  
- A1 Manufacture of preliminary products  
- A2 Transport to the plant  
- A3 Production incl. provision of energy, manufacturing packaging as well as auxiliaries and consumables and waste treatment)  
- 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. The data was taken from GaBi 5:2010 data bases with the result that it is consistent.

**3.7 Period under review**

The review period concerns annual production in 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).

**Transport (A4)**

Name	Value	Unit
Litres of fuel	0.0016	l/100km

Transport distance	500	km
Capacity utilisation (including empty runs)	85	%
Gross density of products transported	1000 - 1450	kg/m <sup>3</sup>
Capacity utilisation volume factor	100	-

#### Construction installation process (A5)

Name	Value	Unit
Material loss	0.01	kg

#### Reference service life

Name	Value	Unit
Reference service life	40	a

## 5. LCA: Results

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

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement <sup>1)</sup>	Refurbishment <sup>1)</sup>	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	X

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 kg MasterTop BC 325N, MasterTop BC 325NFLR, MasterTop BC 327FLR, MasterTop BC 361N, MasterTop BC 375N, MasterTop BC 375NAS

Parameter	Unit	A1 - A3	A4	A5	D
Global warming potential	[kg CO <sub>2</sub> -Eq.]	4.66E+0	2.58E-2	1.25E-1	-1.25E-1
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	3.4E-8	1.38E-12	4.5E-12	-1.34E-10
Acidification potential of land and water	[kg SO <sub>2</sub> -Eq.]	1.43E-2	1.64E-4	1.45E-5	-3.15E-4
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3-</sup> -Eq.]	2.67E-3	4.06E-5	2.94E-6	-2.77E-5
Formation potential of tropospheric ozone photochemical oxidants	[kg Ethen Eq.]	2.5E-3	-7.03E-5	1.3E-6	-4.39E-5
Abiotic depletion potential for non fossil resources	[kg Sb Eq.]	2.55E-5	1.18E-9	1.82E-9	-6.35E-9
Abiotic depletion potential for fossil resources	[MJ]	8.7E+1	3.56E-1	2.96E-2	-1.66E+0

### RESULTS OF THE LCA - RESOURCE USE: 1 kg MasterTop BC 325N, MasterTop BC 325NFLR, MasterTop BC 327FLR, MasterTop BC 361N, MasterTop BC 375N, MasterTop BC 375NAS

Parameter	Unit	A1 - A3	A4	A5	D
Renewable primary energy as energy carrier	[MJ]	3.18E+0	-	-	-
Renewable primary energy resources as material utilization	[MJ]	0.0E+0	-	-	-
Total use of renewable primary energy resources	[MJ]	3.18E+0	1.42E-2	2.19E-3	-6.74E-2
Non renewable primary energy as energy carrier	[MJ]	6.94E+1	-	-	-
Non renewable primary energy as material utilization	[MJ]	1.98E+1	-	-	-
Total use of non renewable primary energy resources	[MJ]	8.92E+1	3.56E-1	2.96E-2	-1.66E+0
Use of secondary material	[kg]	0.0E+0	-	-	-
Use of renewable secondary fuels	[MJ]	1.5E-3	3.01E-6	4.01E-7	7.66E-4
Use of non renewable secondary fuels	[MJ]	1.54E-2	3.16E-5	4.2E-6	8.07E-3
Use of net fresh water	[m <sup>3</sup> ]	2.65E+0	1.32E-3	2.53E-3	-6.09E-2

### RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

#### 1 kg MasterTop BC 325N, MasterTop BC 325NFLR, MasterTop BC 327FLR, MasterTop BC 361N, MasterTop BC 375N, MasterTop BC 375NAS

Parameter	Unit	A1 - A3	A4	A5	D
Hazardous waste disposed	[kg]	-	-	-	-
Non hazardous waste disposed	[kg]	5.88E+0	1.88E-3	5.94E-3	-6.31E-1
Radioactive waste disposed	[kg]	1.94E-3	5.03E-7	1.52E-6	-3.57E-5
Components for re-use	[kg]	-	-	-	-
Materials for recycling	[kg]	-	-	-	-
Materials for energy recovery	[kg]	-	-	-	-
Exported electrical energy	[MJ]	-	-	1.77E-1	-
Exported thermal energy	[MJ]	-	-	4.27E-1	-

"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 not 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

**Non-renewable primary energy requirements (PENRT)** are clearly dominated by the manufacture of

preliminary products (Module A1) (> 90%). This high percentage is dominated by the energy-intensive production of preliminary products based on crude oil,

whereby the curing agent component nevertheless makes a significant contribution towards the PENRT. In terms of kg, the contribution made by the resin component is somewhat lower compared to the curing agent component while fillers only make a minimum contribution towards the PENRT.

Accounting for approx. 3%, the share of **renewable primary energy** in the over all energy requirements is low. This low share is primarily caused by percentages of renewable energy in the German power mix as well as the wooden pallets used for packaging.

The primary influential factor for the **Global Warming Potential (GWP)** is accounted for by the provision of preliminary products (approx. 90%) As for the PENRT, the curing agent component has a greater influence on the GWP than the resin component. During manufacture (A3), approx. 5% of the greenhouse gases are emitted, whereby manufacture of the tinplate container for packaging plays the greatest role. At over 90%, carbon dioxide emissions are the primary cause of the GWP.

The manufacture of preliminary products accounts for more than 90% of the **Ozone Depletion Potential (ODP)**. Pigment (TiO<sub>2</sub>) and zeolite manufacture can however make a measurable contribution towards the ODP depending on their contents in the recipe while Module A3, i.e. the manufacture of reactive resins, also has a significant influence on the ODP. All other modules are irrelevant for the Ozone Depletion

Potential. In both cases, the main drivers are halogenated organic emissions from the German power mix (especially R114).

The **Acidification Potential (AP)** is primarily attributable to nitric oxides and SO<sub>2</sub> which - like in all other modules - are largely incurred during the manufacture of preliminary products (A1) and the actual products (A3). The two main components, i.e. resin and curing agent, also make a considerable contribution to the AP. Module A3 also measurably influences the AP which is primarily attributable to the manufacture of packaging materials.

> 90% of the **Eutricification Potential (EP)** is dominated by the manufacture of preliminary products, whereby the resin component plays the main role. The curing agent component also makes a significant contribution towards the overall EP results. In Module A3, which only has a very low influence on the EP, most emissions are attributable to the manufacture of packaging as well as electricity consumption. The main cause of the EP is represented by various nitric oxide emissions into the air as well as acidification of water.

In terms of the **Summer Smog Potential (POCP)**, the manufacture of preliminary products dominates the result accounting for > 85%, whereby manufacture of the curing agent component makes a greater contribution to the overall POCP results than manufacture of the resin component.

## 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/m<sup>3</sup>]):

Classification / EMICODE	EC1 PLUS	EC1	EC2	RAL UZ 113 (*)	DIBt/AgBB
TVOC (C <sub>6</sub> -C <sub>16</sub> ) (after 3 / 28 d)	750 / 60	1000 / 100	3000 / 300	1000 / 100	10000 / 1000
TSVOC (C <sub>16</sub> -C <sub>22</sub> ) (after 28 d)	40	50	100	50	100
C1, C2 substances * Total after 3 d, ** per substance after 28 d	10* / 1**	10* / 1**	10* / 1**	10/1**	10 / 1**
Total formaldehyde / acetaldehyde [ppb] (after 3 d)	50/50	50/50	50/50	50/50	-/-
Total VOC without NIK and unidentified substances (after 28 d)	40	-	-	40	100
R-value (after 28d)	1	-	-	1	1

(\*) 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. AgBB test and DIBt approval) shall apply as **evidence**. If necessary, the results are to be provided in the form of the emission class.

### VOC emissions acc. to AgBB scheme

The results outlined above Results were communicated for the MasterTop BC 375N coating in MasterTop 1324 system design (AgBB overview of results **after 7 days**).

Name	Value	Unit
TVOC (C <sub>6</sub> - C <sub>16</sub> )	87	µg/m <sup>3</sup>
Sum SVOC (C <sub>16</sub> - C <sub>22</sub> )	0	µg/m <sup>3</sup>
R (dimensionless)	0.03	-
VOC without NIK	0	µg/m <sup>3</sup>
Carcinogenic Substances	0	µg/m <sup>3</sup>



## 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](http://www.bau-umwelt.de)

#### **PCR 2011, Part A**

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Institut Bauen  
und Umwelt e.V.

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Institut Bauen und Umwelt e.V.  
Panoramastr. 1  
10178 Berlin  
Germany

Tel +49 (0)30 3087748- 0  
Fax +49 (0)30 3087748- 29  
Mail [info@bau-umwelt.com](mailto:info@bau-umwelt.com)  
Web [www.bau-umwelt.com](http://www.bau-umwelt.com)



Institut Bauen  
und Umwelt e.V.

**Programme holder**

Institut Bauen und Umwelt e.V.  
Panoramastr 1  
10178 Berlin  
Germany

Tel +49 (0)30 - 3087748- 0  
Fax +49 (0)30 - 3087748 - 29  
Mail [info@bau-umwelt.com](mailto:info@bau-umwelt.com)  
Web [www.bau-umwelt.com](http://www.bau-umwelt.com)



**PE INTERNATIONAL**  
EXPERTS IN SUSTAINABILITY

**Author of the Life Cycle Assessment**

PE INTERNATIONAL AG  
Hauptstraße 111  
70771 Leinfelden-Echterdingen  
Germany

Tel +49 (0)711 341817-0  
Fax +49 (0)711 341817-25  
Mail [info@pe-international.com](mailto:info@pe-international.com)  
Web [www.pe-international.com](http://www.pe-international.com)



**Owner of the Declaration**

BASF Construction Chemicals Europe  
AG  
Industriestrasse 26  
8207 Schaffhausen  
Switzerland

Tel +41 58 958 29 11  
Fax +41 58 958 35 87  
Mail [gwenael.jan@basf.com](mailto:gwenael.jan@basf.com)  
Web [www.master-builders-solutions.basf.co.uk](http://www.master-builders-solutions.basf.co.uk)