 ENVIRONMENTAL PRODUCT DECLARATION  
as per ISO 14025 and EN 15804  

<table>
<thead>
<tr>
<th>Owner of the Declaration</th>
<th>PPG Coatings Deutschland GmbH</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-PPG-20130010-CAA1-EN</td>
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<tr>
<td>Issue date</td>
<td>7/18/2013</td>
</tr>
<tr>
<td>Valid to</td>
<td>7/17/2018</td>
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</table>

Polymatt  
Sigma Coatings
General Information

Sigma Coatings
Programme holder
IBU - Institut Bauen und Umwelt e.V.
Rheinufer 108
D-53639 Königswinter

Declarant number
EPD-PPG-20130010-CAA1-EN

Owner of the Declaration
PPG Coatings Deutschland GmbH
An der Halde 1
44805 Bochum

Declared product / Declared unit
1 kg of Sigma Polymatt.

Scope:
This EPD is applicable to the Sigma Coatings product Sigma Polymatt produced at the PPG production site in Uithoorn, The Netherlands. The owner of the declaration shall be liable for the underlying information and evidence.

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. Hoerst J. Bossenmayer
(Chairman of SVA)

Prof. Dr.-Ing. Hans-Wolf Reinhardt
(Independent tester appointed by SVA)

Product

Product description
Sigma Polymatt from Sigma Coatings Germany is a water based dispersion paint for interior wall coatings. As defined in the European norm EN13300, the product is classed as having a matt finish, and Category 1 for both opacity and wet scrub resistance. In the wet form the product should appear as a free flowing, viscous liquid and be uniform in appearance. After standing for long periods of time the product may exhibit the separation of a small quantity of surface liquid. This can be rectified by mixing the product until homogeneous and should in no way affect the performance of the product.

Sigma Polymatt is available in a range of tinted colours. The colour of the wet product gives an approximate indication of the colour of the final dried coating, although it may show slight deviations in the wet phase.

Application
Sigma Polymatt can be applied using a roller, brush, or by spray application techniques. It is suitable for application on all surfaces in interior living and working areas. These include (but are not limited to):

- Plaster board
- Gypsum plaster
- Ingrain wall paper (Rauhfaser)

- Wall Paper
- Structured wall paper (Strukturtapeten)
- Glass fibre wall coatings (Glasfasergewebe)

The product is suitable for both new uncoated substrates and renovation projects where coating of previously painted surfaces is required.

Sigma Polymatt is not recommended for exterior application, nor is it recommended for application in wet areas.

The substrate should be dry, solid and free of contaminants. Porous, crumbly, and absorbent surfaces should be pre-treated with a primer. Water soluble contaminants should be removed as much as possible. For best results surfaces contaminated with water soluble substances will benefit from the application of a stain isolating primer.

For best results the temperature of the surrounding environment and/or substrate should be above 5°C and less than 25°C.

Technical Data

<table>
<thead>
<tr>
<th>Constructional data</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solids content</td>
<td>52 - 57</td>
<td>%</td>
</tr>
<tr>
<td>Whiteness (CIE) (Measured for</td>
<td>86 - 88</td>
<td>-</td>
</tr>
</tbody>
</table>
Environmental Product Declaration Sigma Coatings – Polymatt

Curing time (time to recoat at 20 degrees and 65% RH) | 4 h
--- | ---
Theoretical spreading rate in accordance to the layer thickness (μm) (Dry layer thickness) | 10.1 - 11.6 m²/kg
Viscosity | 40-50 dPas
Opacity (EN 13300) | Class 1 (>99.5%) at 8m²/L
Abrasion Resistance (EN 13300) | Class 1 (<5µm)
Gloss 60 degrees | 2 - 3 %
Gloss 85 degrees | 1 - 3 %
Density | 1.3 - 1.6 kg.dm⁻³

Base materials / Ancillary materials
Polymatt comprises the following substances:

- Inorganic fillers 20-30%
- Titanium Dioxide 15-20%
- Polymer 5-10%
- Water 40-50%
- Biocide <1%
- Cellulosic thickener <1%
- Organic Additives <1%
- Inorganic Additives <1%

None of the raw materials is listed in the "Candidate list of substances of very high concern for authorisation".

Reference service life
The RSL is dependent on the application scenario which has not been defined in this EPD. Therefore, no RSL is declared.

LCA: Calculation rules

Declared Unit
The declared unit for the calculation is 1 kg of Sigma Coatings Polymatt.

System boundary
The basis of this declaration is the aspect of the life-cycle known as cradle-to-gate, as defined in EN 15804. The results for this are declared in three modules:

A1 - Raw materials. This module includes all operations immediately up to the point before the products leave the gate of the supplier. Included in this module are:
- Extraction of the raw materials
- Transport of the materials from the point of extraction to the site of processing, and any on site or intermediate transport
- Processing of the raw materials including the impact of the energy requirements and waste processing

A2 - Transport of raw materials from the suppliers site to the product manufacturing site. This includes:
- The fuel consumption for the operation of the vehicle
- An allocation for the construction, maintenance and disposal of the vehicle at the end of its life

A3 - This module includes all the activities involved in the production of Polymatt. This includes:
- Energy requirements for processing
- Disposal of any waste generated in the production process
- Emissions, both direct and indirect, during the production process
- The extraction of raw materials and processing into the final product for any packaging used

Impact indicators were calculated using SimaPro V. 7.3. Global warming Potentials were calculated using the characterization factors defined in the IPCC 2007 GWP 100 years. Other environmental impact indicators were calculated using the characterization factors of CML version 2.3 (2007).

Upstream data was modeled using the Ecoinvent LCI database version 2.2.

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.

LCA: Scenarios and additional technical information

The information declared in this EPD is for 1 kg of Polymatt with the scope cradle-to-gate. As such no additional scenarios are included.
## LCA: Results

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

<table>
<thead>
<tr>
<th>PRODUCT STAGE</th>
<th>CONSTRUCTION PROCESS 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>Transport</td>
<td>Maintenance</td>
<td>Repair</td>
<td>Replacement</td>
</tr>
<tr>
<td>Supply</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 kg Sigma Coatings Polymatt

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global warming potential</td>
<td>[kg CO₂eq.]</td>
<td>1.28E+0</td>
<td>1.73E-1</td>
<td>2.07E-1</td>
</tr>
<tr>
<td>Depletion potential of the stratospheric ozone layer</td>
<td>[kg CFC11-Aq.]</td>
<td>2.47E-7</td>
<td>2.78E-8</td>
<td>2.90E-8</td>
</tr>
<tr>
<td>Acidification potential of land and water</td>
<td>[kg SO₂eq.]</td>
<td>8.12E-3</td>
<td>9.40E-4</td>
<td>6.09E-4</td>
</tr>
<tr>
<td>Eutrophication potential</td>
<td>[kg P₂O₅eq.]</td>
<td>2.51E-3</td>
<td>2.95E-4</td>
<td>2.33E-4</td>
</tr>
<tr>
<td>Formation potential of tropospheric ozone photochemical oxidants</td>
<td>[kg C₂H₂O₂eq.]</td>
<td>4.81E-4</td>
<td>2.94E-4</td>
<td>3.73E-5</td>
</tr>
<tr>
<td>Abiotic depletion potential for non fossil resources</td>
<td>[kg Sb Aq.]</td>
<td>8.59E-5</td>
<td>4.95E-5</td>
<td>4.95E-5</td>
</tr>
<tr>
<td>Abiotic depletion potential for fossil resources</td>
<td>[MJ]</td>
<td>1.09E+0</td>
<td>2.39E+0</td>
<td>2.49E+0</td>
</tr>
</tbody>
</table>

### RESULTS OF THE LCA - RESOURCE USE: 1 kg Sigma Coatings Polymatt

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable primary energy as energy carrier</td>
<td>[MJ]</td>
<td>8.97E-1</td>
<td>3.62E-2</td>
<td>2.07E-1</td>
</tr>
<tr>
<td>Renewable primary energy resources as material utilization</td>
<td>[MJ]</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>8.09E-1</td>
</tr>
<tr>
<td>Total use of renewable primary energy resources</td>
<td>[MJ]</td>
<td>8.97E-1</td>
<td>3.62E-2</td>
<td>1.02E+0</td>
</tr>
<tr>
<td>Non renewable primary energy as energy carrier</td>
<td>[MJ]</td>
<td>2.51E+1</td>
<td>2.74E+0</td>
<td>4.66E+0</td>
</tr>
<tr>
<td>Non renewable primary energy as material utilization</td>
<td>[MJ]</td>
<td>2.81E+1</td>
<td>2.74E+0</td>
<td>6.29E+0</td>
</tr>
<tr>
<td>Total use of non renewable primary energy resources</td>
<td>[MJ]</td>
<td>2.51E+1</td>
<td>2.74E+0</td>
<td>6.29E+0</td>
</tr>
<tr>
<td>Use of secondary material</td>
<td>[kg]</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>3.91E-2</td>
</tr>
<tr>
<td>Use of non renewable secondary fuels</td>
<td>[MJ]</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
</tr>
<tr>
<td>Use of net fresh water</td>
<td>[m³]</td>
<td>8.84E-2</td>
<td>6.83E-4</td>
<td>8.76E-4</td>
</tr>
</tbody>
</table>

### RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 kg Sigma Coatings Polymatt

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous waste disposed</td>
<td>[kg]</td>
<td>2.26E-4</td>
<td>7.34E-5</td>
<td>6.61E-4</td>
</tr>
<tr>
<td>Non hazardous waste disposed</td>
<td>[kg]</td>
<td>2.27E-1</td>
<td>2.07E-3</td>
<td>5.48E-3</td>
</tr>
<tr>
<td>Radioactive waste disposed</td>
<td>[kg]</td>
<td>4.95E-5</td>
<td>2.16E-6</td>
<td>4.53E-6</td>
</tr>
<tr>
<td>Components for re-use</td>
<td>[kg]</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>7.58E-2</td>
</tr>
<tr>
<td>Materials for recycling</td>
<td>[kg]</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
</tr>
<tr>
<td>Materials for energy recovery</td>
<td>[kg]</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
</tr>
<tr>
<td>Exported electrical energy</td>
<td>[MJ]</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
</tr>
<tr>
<td>Exported thermal energy</td>
<td>[MJ]</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
<td>0.00E+0</td>
</tr>
</tbody>
</table>

### References

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

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SimaPro
SimaPro LCA software developed by PRé www.pre-sustainability.com

Ecoinvent Life Cycle Inventory Database
www.ecoinvent.org

IPCC
Intergovernmental panel on climate change http://www.ipcc.ch/

Institute of Environmental Science, Leiden (CML)
http://www.cml.leiden.edu/

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