# Environmental Product Declaration

BREG EN EPD No.: 000006 Issue: 02

ECO EPD Ref. No.: 000099

This is to certify that this verified Environmental Product Declaration provided by:

**PPG Coatings**

Is in accordance with the requirements of:

**EN 15804:2012+A1:2013**

This declaration is for:

**Johnstone's Acrylic Satin**

## Company Address

Huddersfield Road

Birstall, Batley
WF17 9XA

JOHNSTONE'S TRADE

PAINT TO BE PROUD OF


| Signed for BRE Global Ltd | Derek Hughes<br>Operator | 22 January 2015<br>Date of this Issue |
|---|---|---|
| 12 December 2014<br>Date of First Issue | | 11 December 2019<br>Expiry Date |

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To check the validity of this EPD please visit www.greenbooklive.com/check or contact us.

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## EPD verification and LCA details

| Demonstration of Verification |
|---|
| CEN standard EN 15804 serves as the core PCR[a] |
| Independent verification of the declaration and data according to EN ISO 14025:2010<br>☐ Internal ☑ External |
| Third party verifier[b]:<br>**Dr Jo Mundy** |
| a: Product category rules<br>b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4) |

| LCA Consultant | Verifier |
|---|---|
| Matthew Percy<br>PPG coatings BV<br>Amsterdamseweg 14<br>Uithoorn, Netherlands<br>1422 AD | Dr Jo Mundy<br>BRE Global<br>Bucknalls Lane<br>Watford<br>WD25 9XX<br>www.bre.co.uk |

# General Information

## Summary

This environmental product declaration is for 1 square metre of Johnstone's Acrylic Satin produced by PPG Coatings at the following manufacturing facilities:

PPG Coatings
Huddersfield Road

Birstall, Batley
WF17 9XA
UK

This is a Cradle to gate with options EPD. The life cycle stages included are as shown below (X = included, MND = module not declared):

| Product | | | Construction | | Use stage | | | | | | | End-of-life | | | | | Benefits and loads beyond the system boundary |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Related to the building fabric | | | | | Related to the building | | | | | | | |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | | D |
| Raw materials supply | Transport | Manufacturing | Transport to site | Construction - Installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational Energy Use | Operational Water use | Deconstruction | Transport | Waste processing | Disposal | | Reuse, Recovery and/or Recycling potential |
| X | X | X | X | X | MND | MND | MND | MND | MND | MND | MND | MND | X | X | X | | MND |

## Programme Operator

BRE Global, Watford, Herts, WD25 9XX, United Kingdom.
This declaration is based on the BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013.

## Comparability

Environmental declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A1:2013. Comparability is further dependent on the product category rules used and the source of the data, e.g. the database. See EN 15804:2012+A1:2013 for further guidance.

# Construction Product

## Product Description

Johnstone's Acrylic Satin is a satin sheen finish that is suitable for interior and exterior use on wood and suitably primed metal surfaces. It provides a low odour, high opacity finish that is quick drying and non-yellowing.

## Technical Information

| Property | Value | Unit |
|---|---|---|
| Spreading Rate | 12 | $m^2/L$ |
| VOC Content | Medium (8 - 24.99) | % |
| Time until touch dry | 2 | hours |

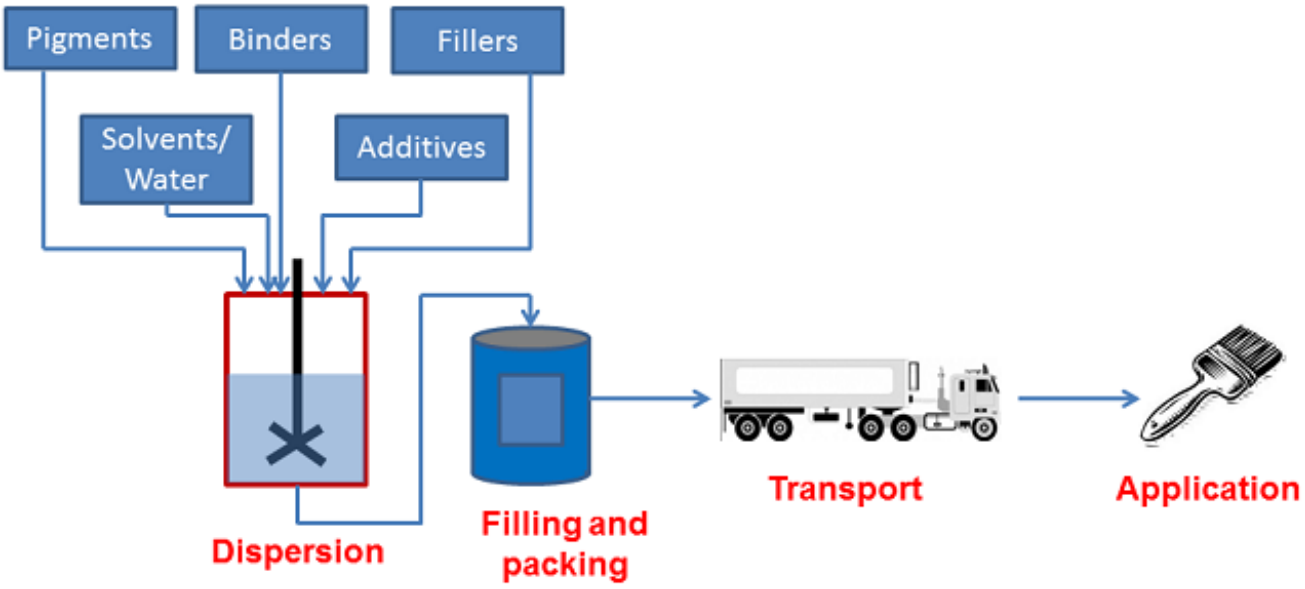
## Product Contents

| Material/Chemical Input | % |
|---|---|
| Additives | 1.00 |
| Film formers | 4.00 |
| Water | 45.00 |
| Inorganic Minerals | 25.00 |
| Polymer Binder | 25.00 |

## Manufacturing Process

The manufacturing process involves the mixing and dispersing of raw materials into a homogeneous mixture. The product is then packaged for distribution to the customer.

## The process flow diagram is shown below:



## Construction Installation

All surfaces to be painted should be clean, dry and free from loose and flaking material. For best results a suitable primer should be first applied.

Stir well before use and apply by brush or roller. Apply liberally and evenly for a smooth finish.

## Reference Service Life

The reference service life of the product is highly dependant on the conditions of use.

## End of Life

Coatings are often not removed, so the end of life the product is that of the end of life of the underlying wood substrate. This can be incineration, landfill or re-use of the wood.

# Life Cycle Assessment Calculation Rules

## Declared / Functional unit

Protecting and decorating 1m² of substrate, suitably prepared, on the basis of one layer of the product.

## System boundary

The system boundaries of the product LCA follow the modular design defined by /EN15804/. This cradle-to-gate with options study includes the Product stage (A1-A3), Transport stage (A4), Installation stage (A5), End-of-life transport (C2), Waste Processing (C3) and Disposal (C4).

## Data sources, quality and allocation

Data related to in-house PPG processes has been collected from PPG reporting systems and is of high quality.

For life cycle modelling of the process, SimaPro V.8.0.3 is used. All relevant background datasets are taken from Ecoinvent V3.01 database and are documented in supporting Ecoinvent documentation.

Many Ecoinvent processes, such as waste disposal, are multi-input and not just for the material specified. For these processes the allocation used for the material in question is the one specified in the Ecoinvent process.

Allocation of waste to reuse and waste disposal streams is made on the basis of recent data from reliable sources.

The allocation of product to different end of life scenarios is based on recent data from reliable sources for the disposal of the wood substrate.

## Cut-off criteria

Cut off criteria are:

- 1% of the renewable and non-renewable energy usage
- 1% of the mass of the process under consideration

The total neglected flows shall be no more than

- 5% of the energy usage
- 5% of the total mass

## LCA Results

(INA = Indicator not assessed, AGG = Aggregated, NA = Not Applicable)

| Indicator | Unit | A1 | A2 | A3 | A1-A3 | A4 | A5 | B1 | B2 | B3 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Raw materials supply | Transport to factory | Manufacturing | Aggregateted | Transport to site | Construction - installation | Use | Maintenance | Repair |
| **Environmental impacts per declared/functional unit** | | | | | | | | | | |
| GWP | kg $CO_2$ eq. | 0.292 | 0.0153 | 0.0298 | INA | 0.00301 | 0.109 | INA | INA | INA |
| ODP | kg CFC 11 eq. | 3.47E-08 | 1.02E-09 | 1.70E-09 | INA | 2.01E-10 | 1.42E-09 | INA | INA | INA |
| AP | kg $SO_2$ eq. | 0.00148 | 8.38E-05 | 0.000122 | INA | 1.65E-05 | 0.000334 | INA | INA | INA |
| EP | kg $(PO_4)^{3-}$ eq. | 0.000645 | 1.97E-05 | 3.87E-05 | INA | 3.87E-06 | 0.000156 | INA | INA | INA |
| POCP | kg $C_2H_4$ eq. | 0.000238 | 8.50E-06 | 2.15E-05 | INA | 1.67E-06 | 6.55E-05 | INA | INA | INA |
| ADPE | kg Sb eq. | 1.82E-05 | 3.26E-08 | 7.97E-07 | INA | 6.40E-09 | 5.96E-07 | INA | INA | INA |
| ADPF | MJ eq. | 5.03 | 0.221 | 0.64 | INA | 0.0434 | 1.99 | INA | INA | INA |
| GWP = Global Warming Potential (Climate Change); ODP = Ozone Depletion Potential; AP = Acidification Potential for Soil and Water; EP = Eutrophication Potential; POCP = Photochemical Ozone Creation; ADPE = Abiotic Depletion Potential – Elements; ADPF = Abiotic Depletion Potential – Fossil Fuels | | | | | | | | | | |
| **Resource use** | | | | | | | | | | |
| PERE | MJ | 0.00671 | 0.00 | 5.10E-05 | INA | 0.00 | 6.76E-05 | INA | INA | INA |
| PERM | MJ | 0.00 | 0.00 | 0.222 | INA | 0.00 | 0.0103 | INA | INA | INA |
| PERT | MJ | 0.00671 | 0.00 | 0.222 | INA | 0.00 | 0.0104 | INA | INA | INA |
| PENRE | MJ | 4.64 | 0.222 | 0.517 | INA | 0.0437 | 1.18 | INA | INA | INA |
| PENRM | MJ | 0.89 | 0.00 | 0.196 | INA | 0.00 | 1.04 | INA | INA | INA |
| PENRT | MJ | 5.53 | 0.222 | 0.713 | INA | 0.0437 | 2.22 | INA | INA | INA |
| SM | kg | 0.00 | 0.00 | 0.00 | INA | 0.00 | 0.00 | INA | INA | INA |
| RSF | MJ | 0.00 | 0.00 | 0.00 | INA | 0.00 | 0.00 | INA | INA | INA |
| NRSF | MJ | 0.00 | 0.00 | 0.00 | INA | 0.00 | 0.00 | INA | INA | INA |
| FW | $m^3$ | 0.00311 | 8.54E-06 | 0.00019 | INA | 1.68E-06 | 0.000475 | INA | INA | INA |
| PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water | | | | | | | | | | |
| **Waste to disposal** | | | | | | | | | | |
| HWD | kg | 0.0691 | 1.67E-05 | 0.00111 | INA | 3.29E-06 | 0.0023 | INA | INA | INA |
| NHWD | kg | 0.103 | 0.000349 | 0.00974 | INA | 6.85E-05 | 0.0331 | INA | INA | INA |
| TRWD | kg | 1.16E-05 | 1.30E-06 | 1.33E-06 | INA | 2.56E-07 | 1.25E-06 | INA | INA | INA |
| RWDHL | kg | 1.42E-06 | 4.76E-09 | 1.64E-07 | INA | 9.36E-10 | 1.43E-07 | INA | INA | INA |
| HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; TRWD = Total Radioactive waste disposed; RWDHL = Radioactive waste disposed (high-level nuclear waste) | | | | | | | | | | |
| **Other output flows** | | | | | | | | | | |
| CRU | kg | 0.00 | 0.00 | 0.00 | INA | 0.00 | 0.00 | INA | INA | INA |
| MFR | kg | 0.00 | 0.00 | 0.000215 | INA | 0.00 | 0.00717 | INA | INA | INA |
| MER | kg | 0.00 | 0.00 | 0.00038 | INA | 0.00 | 0.0521 | INA | INA | INA |
| EE | MJ | 0.00 | 0.00 | 0.00 | INA | 0.00 | 0.00 | INA | INA | INA |
| CRU = Components for reuse; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Export energy | | | | | | | | | | |

## LCA Results (continued)

(INA = Indicator not assessed, AGG = Aggregated, NA = Not Applicable)

| Indicator | Unit | B4 Replacement | B5 Refurbishment | B6 Operational energy use | B7 Operational water use | C1 Demolition | C2 Transport | C3 Waste processing | C4 Disposal | D Reuse/ Recovery/ Recycling potential |
|---|---|---|---|---|---|---|---|---|---|---|
| **Environmental impacts per declared/functional unit** | | | | | | | | | | |
| GWP | kg $CO_2$ eq. | INA | INA | INA | INA | INA | 0.000612 | 7.86E-07 | 0.0194 | INA |
| ODP | kg CFC 11 eq. | INA | INA | INA | INA | INA | 4.08E-11 | 3.53E-14 | 1.07E-09 | INA |
| AP | kg $SO_2$ eq. | INA | INA | INA | INA | INA | 3.34E-06 | 3.95E-09 | 2.03E-05 | INA |
| EP | kg $(PO_4)^{3-}$ eq. | INA | INA | INA | INA | INA | 7.85E-07 | 1.69E-09 | 3.62E-05 | INA |
| POCP | kg $C_2H_4$ eq. | INA | INA | INA | INA | INA | 3.39E-07 | 8.97E-10 | 1.87E-06 | INA |
| ADPE | kg Sb eq. | INA | INA | INA | INA | INA | 1.30E-09 | 8.72E-12 | 4.53E-08 | INA |
| ADPF | MJ eq. | INA | INA | INA | INA | INA | 0.00881 | 9.79E-06 | 0.0395 | INA |
| GWP = Global Warming Potential (Climate Change); ODP = Ozone Depletion Potential; AP = Acidification Potential for Soil and Water; EP = Eutrophication Potential; POCP = Photochemical Ozone Creation; ADPE = Abiotic Depletion Potential – Elements; ADPF = Abiotic Depletion Potential – Fossil Fuels | | | | | | | | | | |
| **Resource use** | | | | | | | | | | |
| PERE | MJ | INA | INA | INA | INA | INA | 0.00 | 0.00 | 0.00 | INA |
| PERM | MJ | INA | INA | INA | INA | INA | 0.00 | 0.00 | 0.00 | INA |
| PERT | MJ | INA | INA | INA | INA | INA | 0.00 | 0.00 | 0.00 | INA |
| PENRE | MJ | INA | INA | INA | INA | INA | 0.00887 | 1.01E-05 | 0.0446 | INA |
| PENRM | MJ | INA | INA | INA | INA | INA | 0.00 | 0.00 | 0.00 | INA |
| PENRT | MJ | INA | INA | INA | INA | INA | 0.00887 | 1.01E-05 | 0.0446 | INA |
| SM | kg | INA | INA | INA | INA | INA | 0.00 | 0.00 | 0.00 | INA |
| RSF | MJ | INA | INA | INA | INA | INA | 0.00 | 0.00 | 0.00 | INA |
| NRSF | MJ | INA | INA | INA | INA | INA | 0.00 | 0.00 | 0.00 | INA |
| FW | $m^3$ | INA | INA | INA | INA | INA | 3.41E-07 | 3.84E-09 | 4.03E-05 | INA |
| PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water | | | | | | | | | | |
| **Waste to disposal** | | | | | | | | | | |
| HWD | kg | INA | INA | INA | INA | INA | 6.68E-07 | 9.79E-08 | 0.0126 | INA |
| NHWD | kg | INA | INA | INA | INA | INA | 1.39E-05 | 8.64E-07 | 0.0191 | INA |
| TRWD | kg | INA | INA | INA | INA | INA | 5.19E-08 | 2.20E-11 | 1.53E-07 | INA |
| RWDHL | kg | INA | INA | INA | INA | INA | 1.90E-10 | 1.00E-12 | 1.54E-08 | INA |
| HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; TRWD = Total Radioactive waste disposed; RWDHL = Radioactive waste disposed (high-level nuclear waste) | | | | | | | | | | |
| **Other output flows** | | | | | | | | | | |
| CRU | kg | INA | INA | INA | INA | INA | 0.00 | 0.00 | 0.00 | INA |
| MFR | kg | INA | INA | INA | INA | INA | 0.00 | 0.00 | 0.00 | INA |
| MER | kg | INA | INA | INA | INA | INA | 0.00 | 0.00 | 0.0129 | INA |
| EE | MJ | INA | INA | INA | INA | INA | 0.00 | 0.00 | 0.00 | INA |
| CRU = Components for reuse; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Export energy | | | | | | | | | | |

## Scenarios and Additional Technical Information

| Module A4 – Transport to the building site | | | | |
|---|---|---|---|---|
| **Vehicle Type** | **Fuel Consumption (L/km)** | **Distance (km)** | **Capacity Utilisation (%)** | **Density Of Product (kg/m³)** |
| Heavy duty vehicle | 0.32 | 300 | 50 | 1247 |

| Module A5 - Installation in the building | | | |
|---|---|---|---|
| **Parameter** | **Description** | **Unit** | **Value** |
| Ancillary materials for installation | Plastic sheeting to protect from spills | g | 22.8 |
| Ancillary materials for installation | Brush for application | g | 0.937 |
| Waste materials from installation wastage | Disposal secondary packaging | g | 12.13 |
| Waste materials from installation wastage | Disposal primary packaging | g | 4.39 |
| Waste materials from installation wastage | Disposal paint lost in spills and residue | g | 1.04 |
| Waste materials from installation wastage | Disposal of plastic sheeting for installation | g | 22.8 |
| Waste materials from installation wastage | Disposal of brush used for installation | g | 0.937 |

| End-of-life modules – C1, C3, and C4 | | | |
|---|---|---|---|
| **Parameter** | **Description** | **Unit** | **Value** |
| Waste for recycling | Waste for recycling | g | 26.2 |
| Waste for energy recovery | Waste to incineration | g | 13.7 |
| Waste for final disposal | Waste to landfill | g | 12.9 |

| Module C2 – Transport to waste processing | | | | |
|---|---|---|---|---|
| **Vehicle Type** | **Fuel Consumption (L/km)** | **Distance (km)** | **Capacity Utilisation (%)** | **Density Of Product (kg/m³)** |
| Heavy duty vehicle (for reused material to sorting station) | 0.32 | 250 | 50 | 1247 |
| Heavy duty vehicle (to disposal site for disposed waste) | 0.32 | 30 | 50 | 1247 |

## Interpretation

The raw materials stage (A1) tends to contribute highly to the impact of many indicators (Figure 1). This high contribution of raw materials to the impact indicators is not unexpected. As paints are a business to consumer product, they are at the end of the chemical value chain, and as such much of the expenditure of energy, raw materials, processing, waste processing, etc. in bringing the product to existence has occurred prior to the entry of the raw materials onto the PPG production site.

Of the raw materials the majority of each impact comes from the titanium dioxide and the binder (Figure 2). This is typical for coatings products and not unexpected given these two raw materials are often present in high proportions and have a relatively high environmental impact.

The majority of the impact for module A3 comes from the packaging for the product (including raw materials, processing and transport to PPG production site), and not the production process itself (Figure 3). This is expected of paint, as since it is a formulated product. The production process is mixing, dispersing, and some grinding, and does not comprise energy intensive processes such as heating or cooling that would be required for chemical reaction processes.

There is also some noticeable impact from the application stage (A5). When this is examined in detail, it can be seen that the application tools are the major contributors to this module. When the application tools impact is further broken down, it can be seen that the major contribution is from the plastic sheeting (Figure 4). The use of this item is difficult to quantify, for example,

the model is based on a particular scenario of 5m2, and using the plastic sheeting over for a larger area, or for separate jobs would result in a reduction in environmental impact.

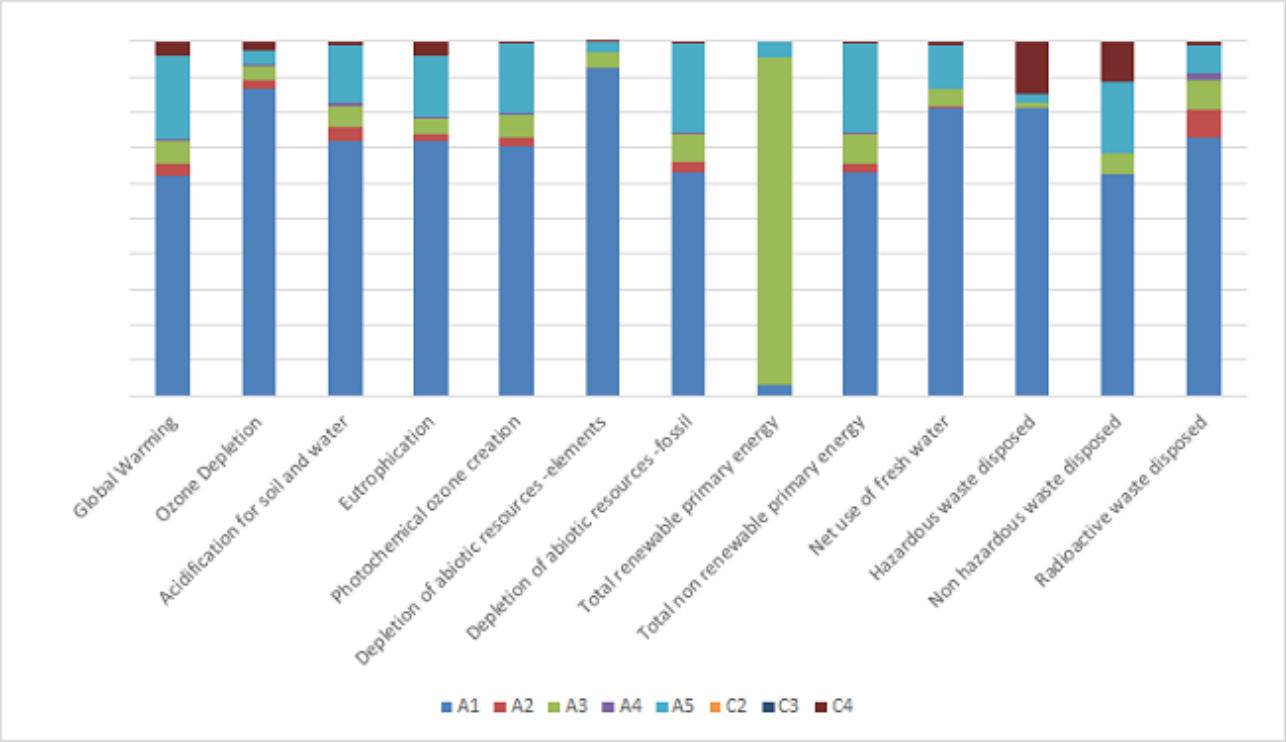



Figure 1

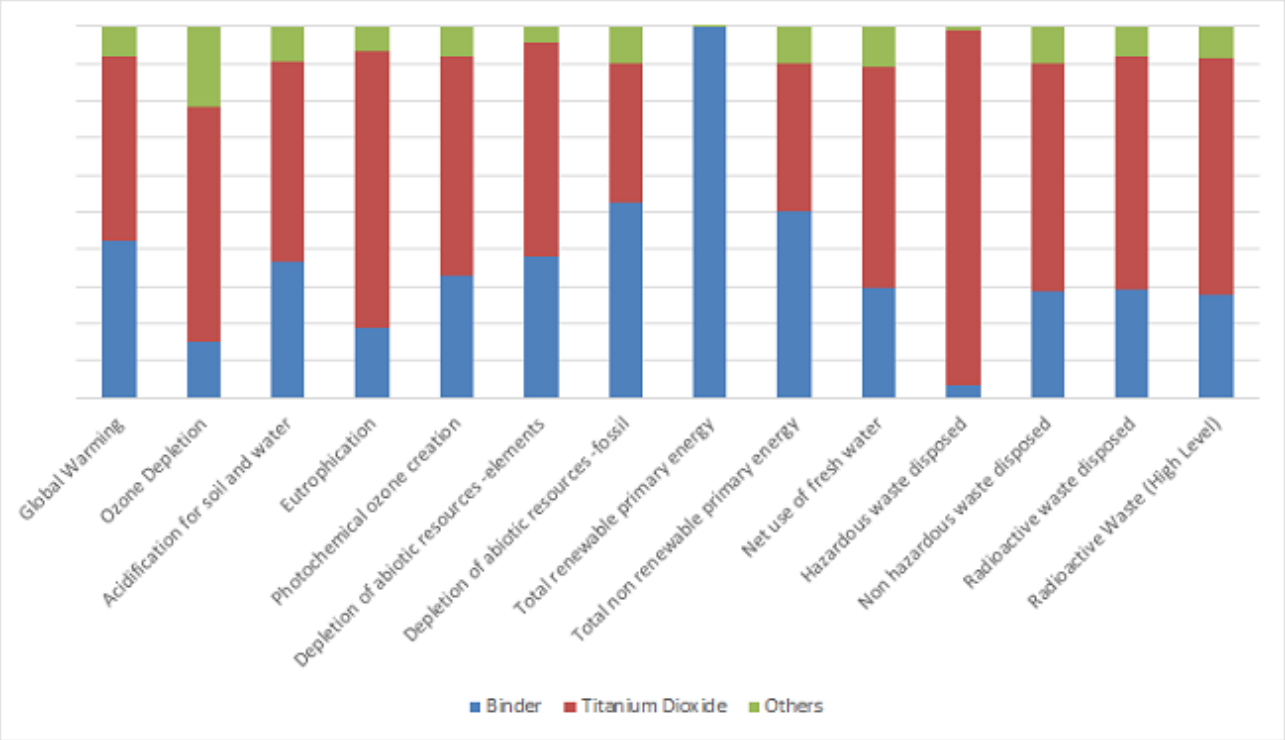



Figure 2

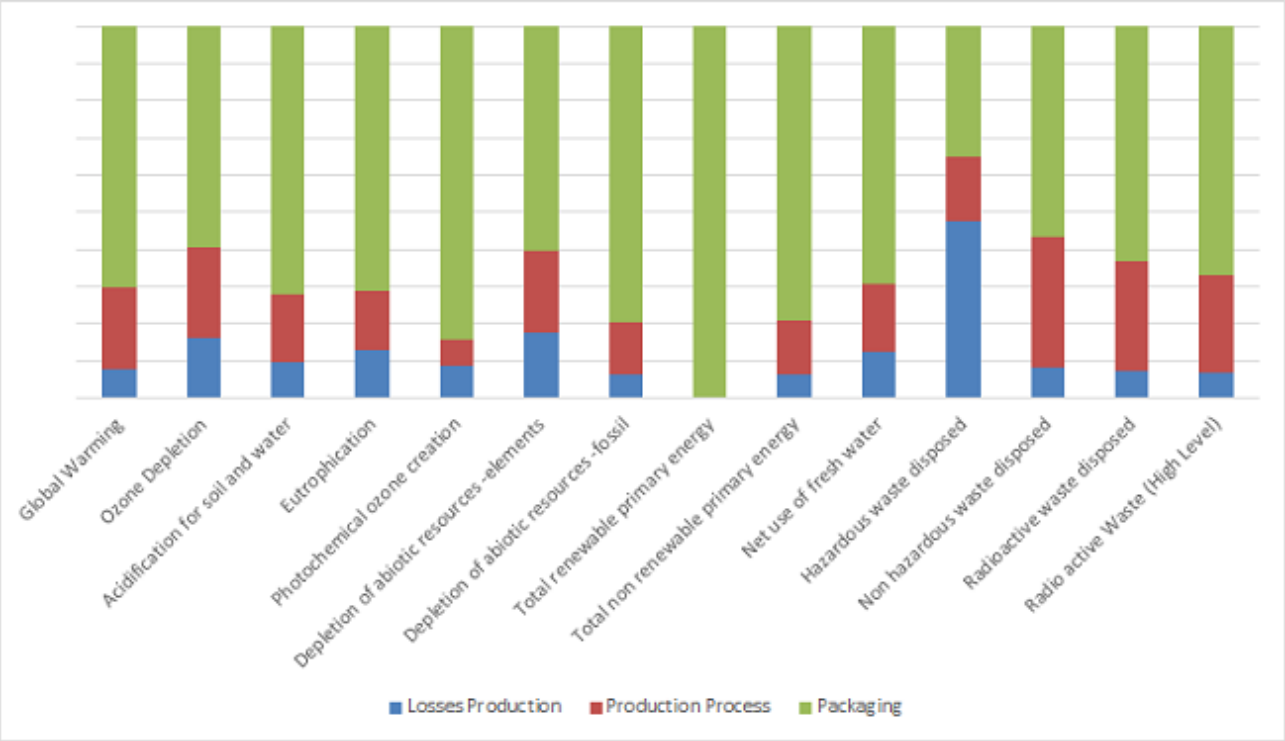



Figure 3

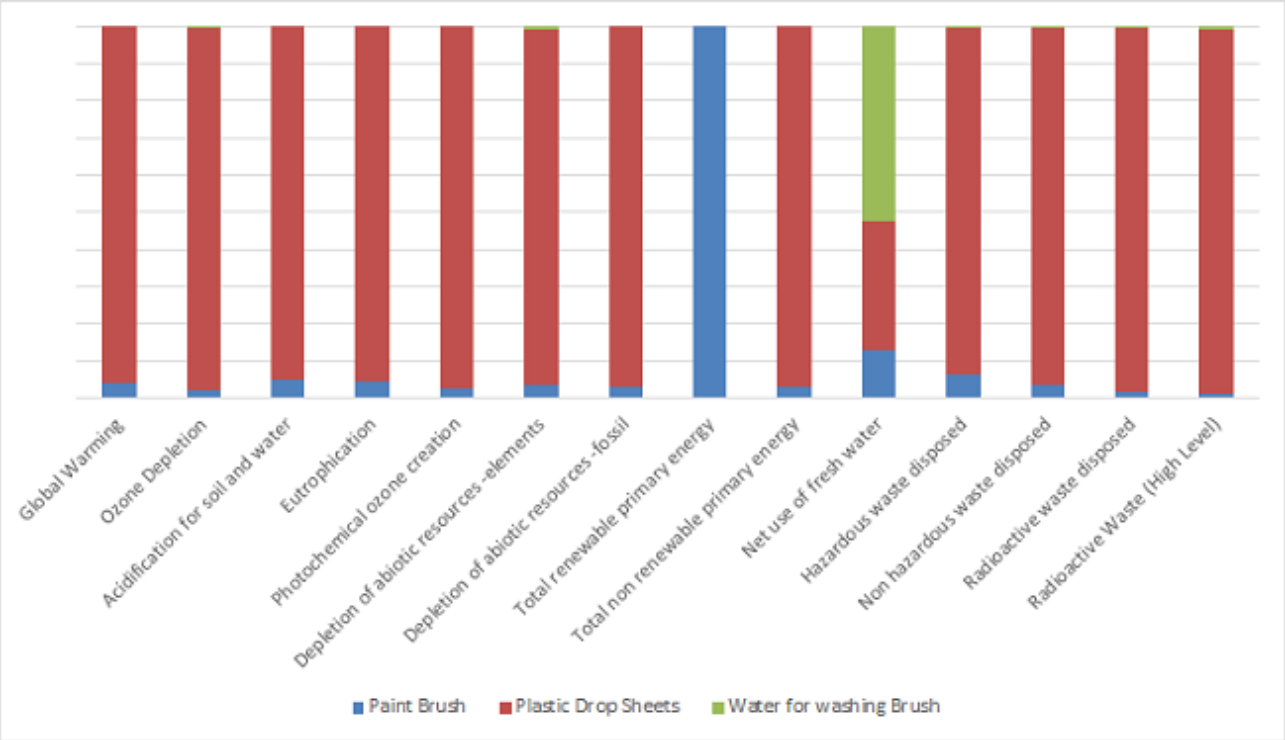



Figure 4

## Sources of additional information

BRE Global. BRE Environmental Profiles 2013: Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013. PN 514. Watford, BRE, 2014.

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A1:2013. London, BSI, 2013.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.

BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.