Environmental Product Declaration

BREG EN EPD No.: 000046 Issue: 01

ECO EPD Ref. No.: 000155

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

PPG Architectural Coatings UK limited

Is in accordance with the requirements of:

EN 15804:2012+A1:2013

This declaration is for:

Johnstone's Acrylic Eggshell

Company Address

Huddersfield Road

Birstall, Batley
WF17 9XA

JOHNSTONE'S TRADE

PAINT TO BE PROUD OF

Signed for BRE Global Ltd	Derek Hughes Operator	27 March 2015 Date of this Issue
27 March 2015 Date of First Issue		26 March 2020 Expiry Date

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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 ☐ Internal ☑ External
Third party verifier[b]: **Dr Owen Abbe**
a: Product category rules 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 PPG Coatings BV Amsterdamseweg 14 Uithoorn 1422 AD, Netherlands	Dr Owen Abbe BRE Global Bucknalls Lane Watford WD25 9XX www.bre.co.uk

General Information

Summary

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

PPG Architectural Coatings UK limited
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	MND	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 Eggshell is a water-based, mid sheen finish formulated for interior use on walls, ceilings, wood and metal work. It provides a low odour, quick drying finish that is resistant to condensation and yellowing, making it ideal for use in kitchens, bathrooms, hospitals, hotels, foodstores, bakeries and public buildings.

Technical Information

Property	Value	Unit
Spreading rate	12	m^2/L
Time to touch dry	1 - 2	Hours
Time to recoat	3 - 4	Hours
VOC content	Low (0.3 - 7.99)	%

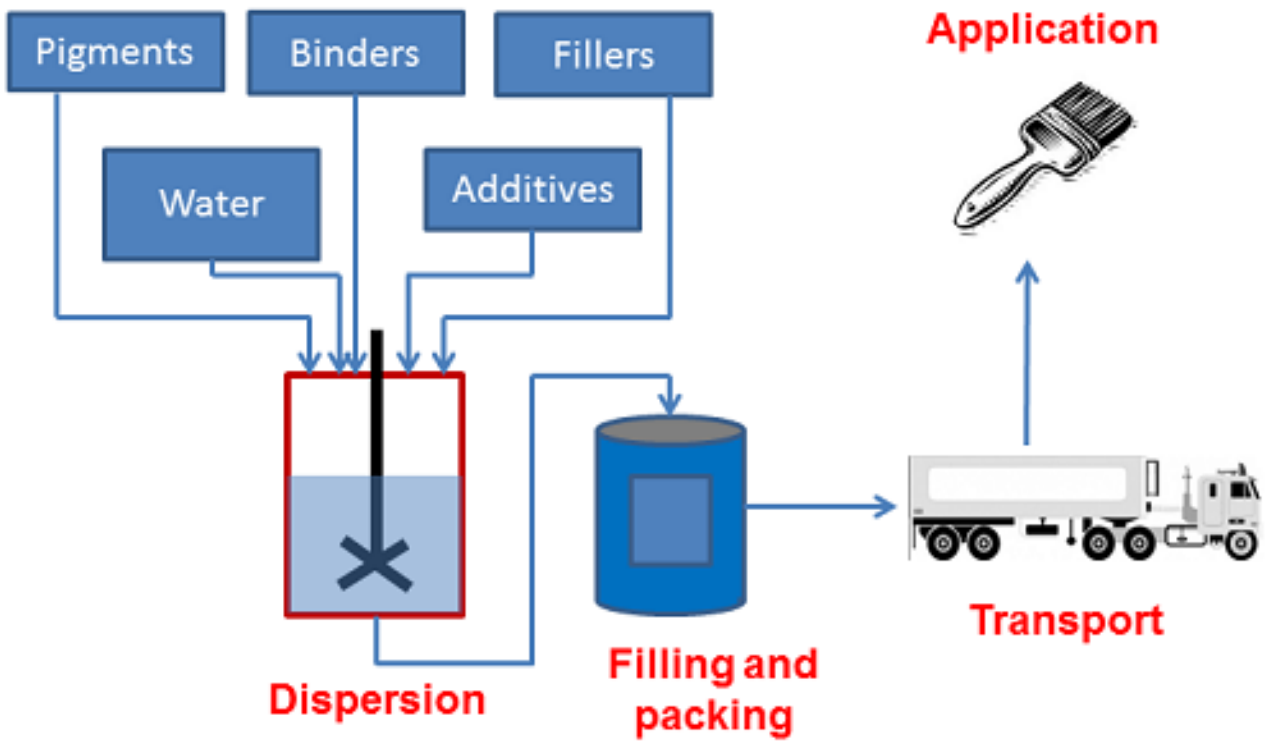
Product Contents

Material/Chemical Input	%
Additives	<2
Binder	20-25
Inorganic Minerals	25-30
Water	45-50
Glycols and esters	<2

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 should be sound, clean, dry and free from grease. Remove any crazed or flaking paint.
Stir well before use and apply by brush, roller or paint pad. When using a roller, use a medium pile synthetic type. Apply liberally and evenly; avoid overspreading. Do not apply when air or surface temperature is less than 10°C or in damp conditions. If more than one can of colour is to be used in the same area, intermix before use.

Reference Service Life

The reference service life of the product is highly dependent 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 substrate. For interior wall paint on a mineral surface this is often landfill.

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) 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.

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.	0.26	0.0173	0.0271	INA	0.00358	0.0302	INA	INA	INA
ODP	kg CFC 11 eq.	2.69E-08	1.16E-09	1.42E-09	INA	2.39E-10	6.64E-10	INA	INA	INA
AP	kg SO_2 eq.	0.00124	9.47E-05	0.000108	INA	1.96E-05	8.35E-05	INA	INA	INA
EP	kg $(PO_4)^{3-}$ eq.	0.000558	2.22E-05	3.29E-05	INA	4.60E-06	5.65E-05	INA	INA	INA
POCP	kg C_2H_4 eq.	0.000209	9.60E-06	1.92E-05	INA	1.99E-06	0.00239	INA	INA	INA
ADPE	kg Sb eq.	1.46E-05	3.68E-08	6.52E-07	INA	7.61E-09	3.08E-07	INA	INA	INA
ADPF	MJ eq.	4.32	0.25	0.596	INA	0.0516	0.455	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	0.00624	0.00	5.84E-06	INA	0.00	6.24E-05	INA	INA	INA
PERM	MJ	0.00	0.00	0.205	INA	0.00	0.00238	INA	INA	INA
PERT	MJ	0.00624	0.00	0.205	INA	0.00	0.00244	INA	INA	INA
PENRE	MJ	3.86	0.251	0.473	INA	0.052	0.311	INA	INA	INA
PENRM	MJ	0.879	0.00	0.192	INA	0.00	0.195	INA	INA	INA
PENRT	MJ	4.74	0.251	0.665	INA	0.052	0.506	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	0.0026	9.65E-06	0.00016	INA	2.00E-06	0.000164	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	0.0647	1.89E-05	0.000624	INA	3.91E-06	0.00132	INA	INA	INA
NHWD	kg	0.0832	0.000394	0.00865	INA	8.15E-05	0.0119	INA	INA	INA
TRWD	kg	9.37E-06	1.47E-06	1.22E-06	INA	3.04E-07	4.56E-07	INA	INA	INA
RWDHL	kg	1.18E-06	5.38E-09	1.52E-07	INA	1.11E-09	5.65E-08	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	0.000326	INA	0.00	0.00536	INA	INA	INA
MER	kg	0.00	0.00	0.000406	INA	0.00	0.0055	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	0.000163	INA	0.000505	INA
ODP	kg CFC 11 eq.	INA	INA	INA	INA	INA	1.09E-11	INA	1.22E-11	INA
AP	kg SO_2 eq.	INA	INA	INA	INA	INA	8.94E-07	INA	8.50E-07	INA
EP	kg $(PO_4)^{3-}$ eq.	INA	INA	INA	INA	INA	2.10E-07	INA	1.89E-05	INA
POCP	kg C_2H_4 eq.	INA	INA	INA	INA	INA	9.06E-08	INA	1.94E-07	INA
ADPE	kg Sb eq.	INA	INA	INA	INA	INA	3.47E-10	INA	1.76E-09	INA
ADPF	MJ eq.	INA	INA	INA	INA	INA	0.00236	INA	0.00305	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	INA	0.00	INA
PERM	MJ	INA	INA	INA	INA	INA	0.00	INA	0.00	INA
PERT	MJ	INA	INA	INA	INA	INA	0.00	INA	0.00	INA
PENRE	MJ	INA	INA	INA	INA	INA	0.00237	INA	0.00314	INA
PENRM	MJ	INA	INA	INA	INA	INA	0.00	INA	0.00	INA
PENRT	MJ	INA	INA	INA	INA	INA	0.00237	INA	0.00314	INA
SM	kg	INA	INA	INA	INA	INA	0.00	INA	0.00	INA
RSF	MJ	INA	INA	INA	INA	INA	0.00	INA	0.00	INA
NRSF	MJ	INA	INA	INA	INA	INA	0.00	INA	0.00	INA
FW	m^3	INA	INA	INA	INA	INA	9.11E-08	INA	3.07E-06	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	1.79E-07	INA	4.39E-06	INA
NHWD	kg	INA	INA	INA	INA	INA	3.72E-06	INA	0.0115	INA
TRWD	kg	INA	INA	INA	INA	INA	1.39E-08	INA	1.51E-08	INA
RWDHL	kg	INA	INA	INA	INA	INA	5.08E-11	INA	2.50E-10	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	INA	0.00	INA
MFR	kg	INA	INA	INA	INA	INA	0.00	INA	0.00	INA
MER	kg	INA	INA	INA	INA	INA	0.00	INA	0.00	INA
EE	MJ	INA	INA	INA	INA	INA	0.00	INA	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 goods vehicle	0.320	300	50	1250

Module A5 - Installation in the building			
Parameter	**Description**	**Unit**	**Value**
Ancillary materials for installation	Roller for application	g	2.13
Ancillary materials for installation	Polypropylene sheeting for spills protection	g	2.28
Waste materials from installation wastage	Disposal of paint lost during application	g	1.04
Waste materials sorted on site for recycling, energy recovery, disposal (specified by route)	Disposal of roller	g	2.13
Waste materials sorted on site for recycling, energy recovery, disposal (specified by route)	Disposal of polypropylene sheeting	g	2.28
Waste materials sorted on site for recycling, energy recovery, disposal (specified by route)	Disposal of primary packaging - polypropylene (Assume: 61% landfill, 31% incineration)	g	4.43
Waste materials sorted on site for recycling, energy recovery, disposal (specified by route)	Disposal of cardboard packaging (Assume: 86% recycling, 9% landfill, 5% incineration)	g	2.01
Waste materials sorted on site for recycling, energy recovery, disposal (specified by route)	Disposal of wooden pallet (Assume: 38% recycling, 26% landfill, 19% incineration)	g	10.18
Waste materials sorted on site for recycling, energy recovery, disposal (specified by route)	Disposal of polyethylene wrap (Assume: 61% landfill, 31% incineration)	g	0.0555
Direct emissions to air, soil and water	VOC emissions	g	0.0626

End-of-life modules – C1, C3, and C4			
Parameter	**Description**	**Unit**	**Value**
Waste for final disposal	Wall paint coating as part of demolition waste sent to landfill	g	55.1

Module C2 – Transport to waste processing				
Vehicle Type	**Fuel Consumption (L/km)**	**Distance (km)**	**Capacity Utilisation (%)**	**Density Of Product (kg/m³)**
Heavy transport vehicle	0.320	30	50	1720

Interpretation

Analysis of the relative contributions of each Module shows that most of the impact comes from the raw materials stage (A1) for most of the indicators (Figure 1). This high contribution of raw materials to the impact indicators is not unexpected. As paints are at the end of the chemical value chain 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.

A further breakdown of the contribution of the different raw material types to environmental indicators in Module A1 shows that 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.

Analysis of Module A3 shows the factors which contribute to this portion of the impact (Figure 3). As can be seen the majority

of the impact for this module comes from the packaging for the product (including raw materials, processing and transport to PPG production site), and not the production process itself. This is expected as paint 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. Hence the contribution from PPG the PPG factory to the environmental impact is low.

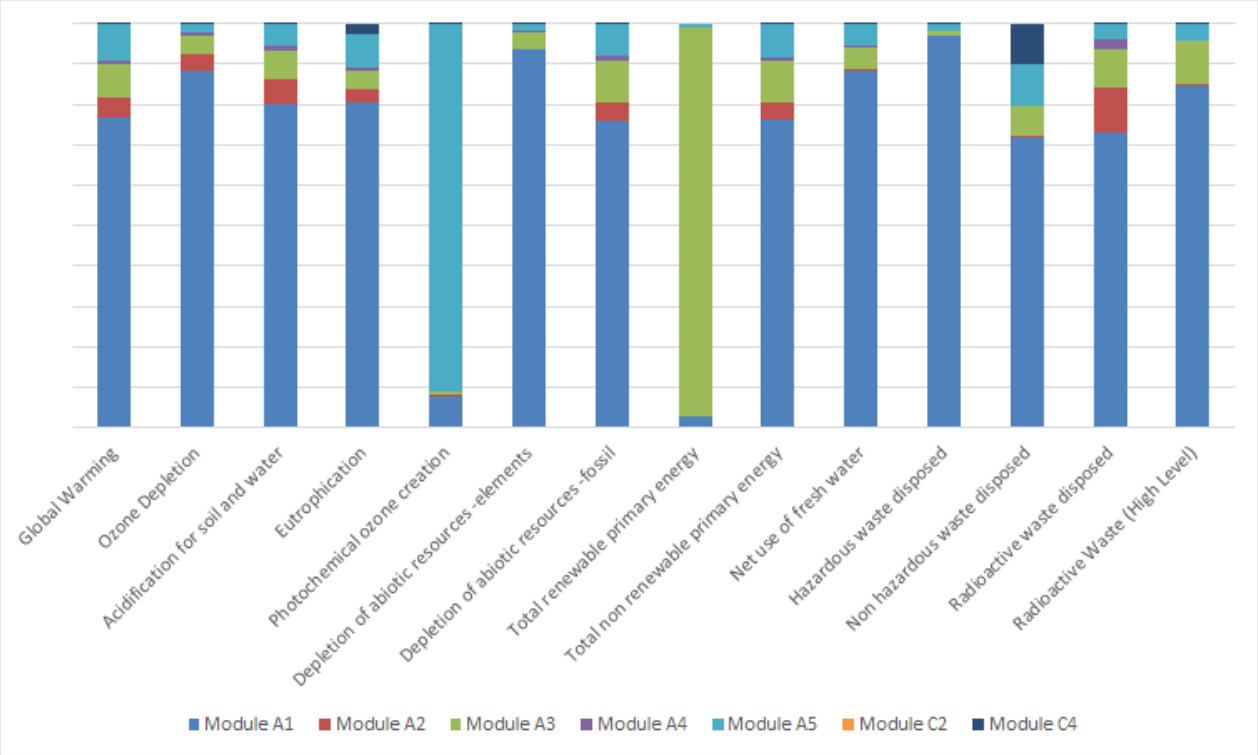


Figure 1

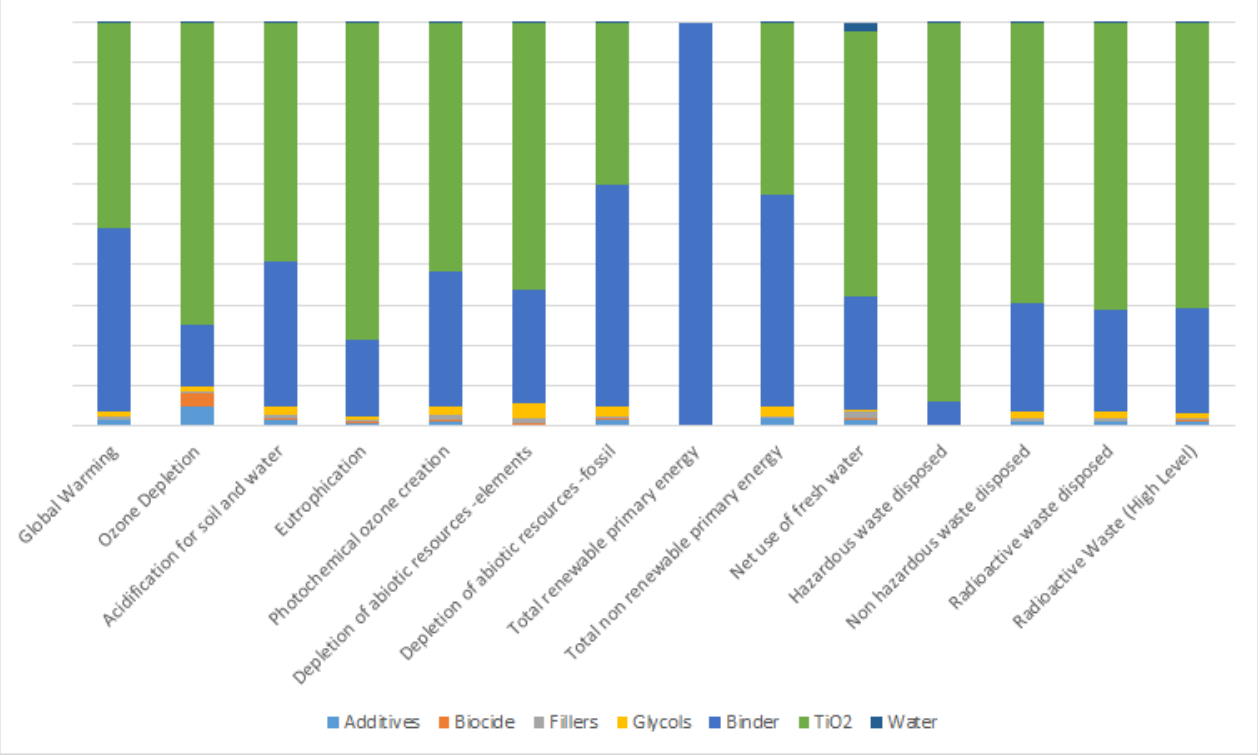


Figure 2

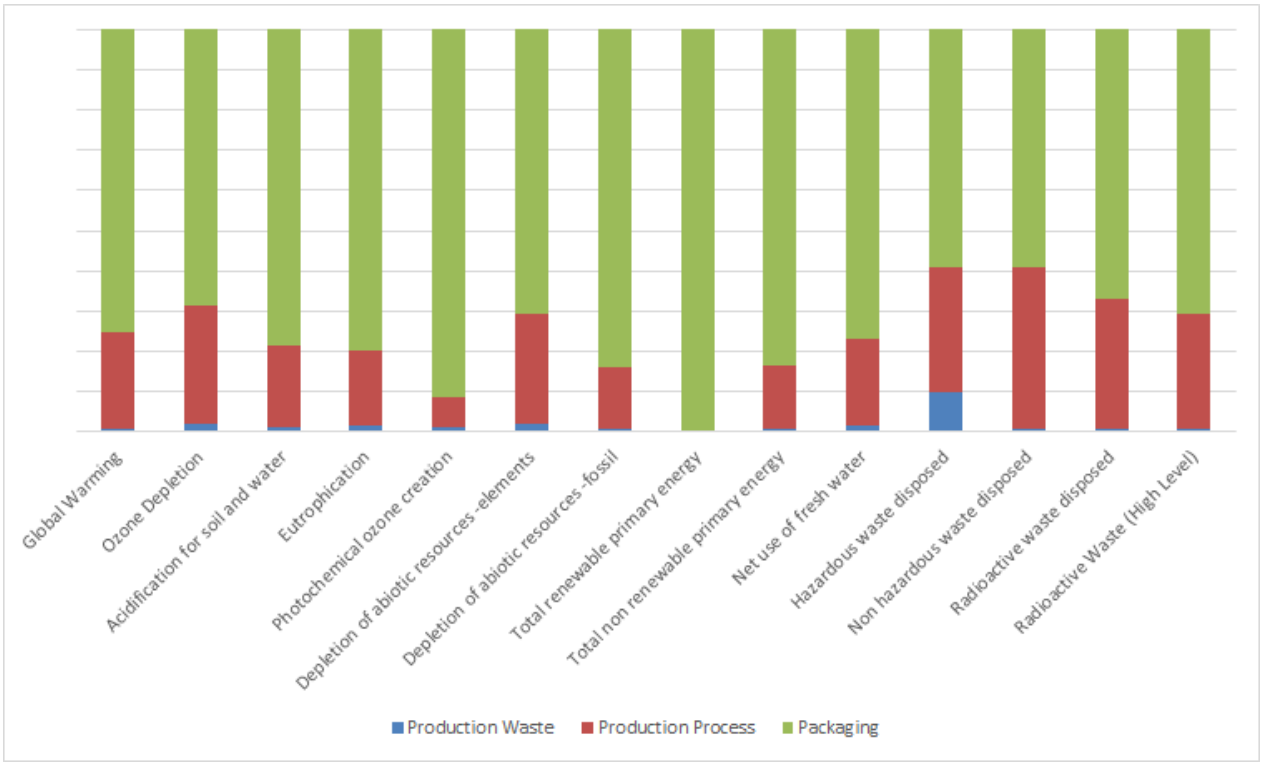


Figure 3

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.