3Statement of Verification

BREG EN EPD No.: 000162 Issue 01

ECO EPD Ref. No. 00000583

This is to verify that the

Environmental Product Declaration

provided by:

Crown Paints Ltd

is in accordance with the requirements of:

EN 15804:2012+A1:2013

and

BRE Global Scheme Document SD207

This declaration is for:

1m² Crown Paints Covermatt

Company Address

Crown House
Hollins Road
Darwen
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United Kingdom

Signed for BRE Global Ltd	Emma Baker Operator	02 November 2017 Date of this Issue
02 November 2017 Date of First Issue		01 November 2022 Expiry Date

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Environmental Product Declaration

EPD Number: 000162

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom www.bre.co.uk	BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013
Commissioner of LCA study	**LCA consultant/Tool**
Crown Paints Ltd Crown House Hollins Road Darwen BB3 0BG United Kingdom	Will Schreiber &Xana Villa Garcia 3Keel LLP Unit 11 Standingford House 26 Cave Street Oxford OX4 1BA United Kingdom www.3keel.com
Declared/Functional Unit	**Applicability/Coverage**
1 m^2 coverage of substrate for one coat of paint	Product Average
EPD Type	**Background database**
Cradle to Gate with options	Ecoinvent 3.3

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
(Where appropriate[b])Third party verifier: Dr. Fei Zhang
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Comparability
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A1:2013. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A1:2013 for further guidance

Information modules covered

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 demolition	Transport	Waste processing	Disposal		Reuse, Recovery and/or Recycling potential
☑	☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☑		☐

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Crown Paints Ltd
Sculcoates Lane
Hull
HU5 1RU
United Kingdom

Construction Product:

Product Description

Crown Trade Covermatt is a water-based emulsion specially formulated for the first time decoration of new built interior, allowing surfaces to dry out without compromising the paint surface.

Technical Information

Property	Value, Unit
Spreading rate	13 – 14 m^2 per litre
VOC content	1 g per litre
Time until touch dry	1 – 2 hours

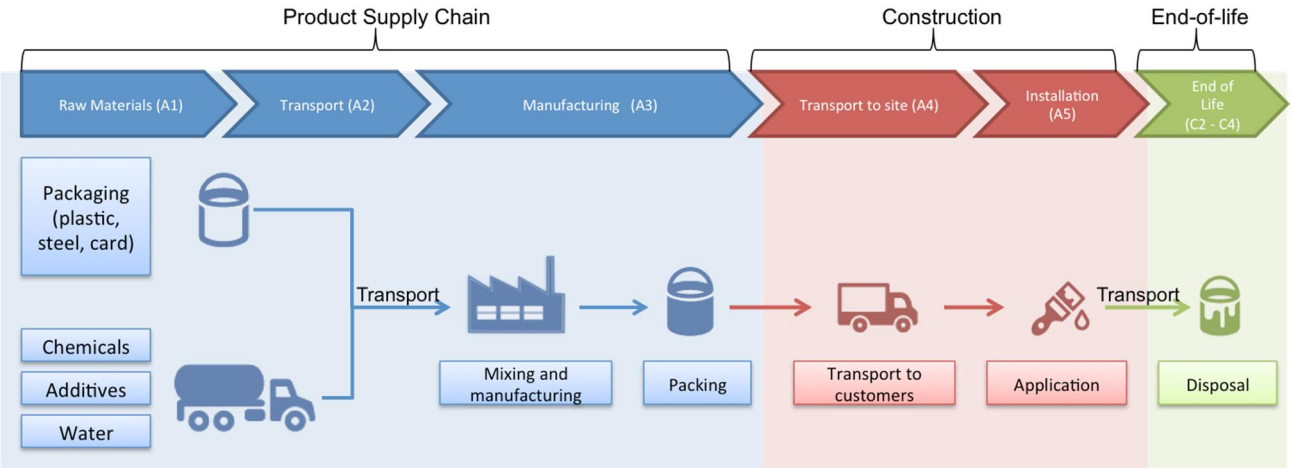
Main Product Contents

Material/Chemical Input	%
Water	55 - 58
Minerals	14 - 18
Clay	20 - 21
Organic chemicals	6 - 7

Manufacturing Process

The manufacturing process for paint involves combining and mixing multiple chemicals and materials into a single homogenous product. The product is them packaged and distributed to trade outlets.

Process flow diagram



Construction Installation

All surfaces must be sound, clean, suitably dry and free from anything that will interfere with the adhesion of the materials to be applied.

Apply all products in accordance with BS 6150: Code of practice for painting of buildlings and BS 8000: Part 12: Code of practice for decorative wall coverings and painting. Stir well before use. Apply by brush or medium roller.

End of Life

Coatings are typically disposed of with the substrate they are painted on. This can be through recycling, incineration or landfill, but the coating itself is unlikely to be separated from the substrate during the disposal process.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

The Declared Unit (DU) is one square metre (m^2) coverage of substrate for one coat of paint. The results are weighted averages of all shades and sizes of paint analysed.

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

Crown Paints primary data was used for all internal processes. Data provided directly by Crown were collated under EN 15084 guidelines to ensure cut-off criteria and other LCA requirements were met. Data were sense-checked against published data for similar products and other secondary sources. Data questions arising during the analysis were satisfactorily answered by technical experts at Crown.

Site wide, 2016 data were received for manufacturing and physically allocated to the paint produced during the period.

Secondary characterisation and resource use factors were obtained from the Ecoinvent 3.3 database for life cycle modelling up and down the supply chain. Where Ecoinvent data is not able to be separated out by the specific stages that are specified in the PCR, they have been allocated to the nearest stage; this is limited to waste processing. Additional data used were as follows:

- Data from published EPD to estimate amounts of plastic sheeting used during paint application;
- Data from Plastics Europe to determine the impacts from polypropylene primary packaging;
- End of life reuse and disposal stream rates are listed on the basis of Crown knowledge and recent data from reliable sources;
- Substrate disposal reuse and disposal streams are made on the basis of UK construction industry recycling statistics from Defra´s UK Statistics on Waste (2015) Table 3.1: Recovery rate from non-hazardous Construction and demolition waste 2010-2012.

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

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts									
			GWP	ODP	AP	EP	POCP	ADPE	ADPF
			kg CO_2 equiv.	kg CFC 11 equiv.	kg SO_2 equiv.	kg $(PO_4)^{3-}$ equiv.	kg C_2H_4 equiv.	kg Sb equiv.	MJ, net calorific value.
Product stage	Raw material supply	A1	0.0850	1.32E-08	0.00097	0.000148	6.34E-05	0.000735	1.65
	Transport	A2	0.00725	1.33E-09	3.46E-05	6.77E-06	1.23E-06	5.27E-05	0.112
	Manufacturing	A3	0.00418	3.68E-10	1.46E-05	3.71E-06	6.94E-07	3.07E-05	0.0483
	Total (of product stage)	A1-3	—	—	—	—	—	—	—
Construction process stage	Transport	A4	0.00515	9.49E-10	2.37E-05	4.64E-06	8.71E-07	3.75E-05	0.0795
	Construction	A5	0.0124	1.96E-10	2.57E-05	5.17E-06	3.95E-05	1.43E-06	0.153
Use stage	Use	B1	MND	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND	MND
End of life	Deconstruction, demolition	C1	MND	MND	MND	MND	MND	MND	MND
	Transport	C2	0.000639	1.18E-10	2.93E-06	5.73E-07	1.08E-07	4.66E-06	0.00987
	Waste processing	C3	MND	MND	MND	MND	MND	MND	MND
	Disposal	C4	0.00741	2.45E-10	6.18E-06	1.45E-06	1.46E-06	9.53E-06	0.0229
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND	MND	MND	MND

GWP = Global Warming Potential;
ODP = Ozone Depletion Potential;
AP = Acidification Potential for Soil and Water;
EP = Eutrophication Potential;
POCP = Formation potential of tropospheric Ozone;
ADPE = Abiotic Depletion Potential – Elements;
ADPF = Abiotic Depletion Potential – Fossil Fuels;

LCA Results (continued)

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	0.112	0.0420	0.154	1.71	INA	1.71
	Transport	A2	0.00141	0.000378	0.00178	0.112	INA	0.112
	Manufacturing	A3	0.00123	0.000268	0.0015	0.0495	INA	0.0495
	Total (of product stage)	A1-3	—	—	—	—	—	—
Construction process stage	Transport	A4	0.000988	0.00027	0.00126	0.0798	INA	0.0798
	Construction	A5	0.0146	0.00709	0.0217	0.153	INA	0.153
Use stage	Use	B1	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND
End of life	Deconstruction, demolition	C1	MND	MND	MND	MND	MND	MND
	Transport	C2	0.000122	3.35E-05	0.000156	0.00991	INA	0.00991
	Waste processing	C3	MND	MND	MND	MND	MND	MND
	Disposal	C4	0.000892	0.000224	0.00112	0.023	INA	0.023
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND	MND	MND

PERE = Use of renewable primary energy excluding renewable primary energy 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 resource

LCA Results (continued)

Parameters describing resource use, secondary materials and fuels, use of water						
			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m^3
Product stage	Raw material supply	A1	INA	INA	INA	0.00145
	Transport	A2	INA	INA	INA	2.12E-05
	Manufacturing	A3	INA	INA	INA	3.54E-05
	Total (of product stage)	A1-3	—	—	—	—
Construction process stage	Transport	A4	INA	INA	INA	1.50E-05
	Construction	A5	INA	INA	INA	2.37E-05
Use stage	Use	B1	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND
End of life	Deconstruction, demolition	C1	MND	MND	MND	MND
	Transport	C2	INA	INA	INA	1.86E-06
	Waste processing	C3	MND	MND	MND	MND
	Disposal	C4	INA	INA	INA	2.30E-05
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;
NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	1.61E-06	0.0449	6.09E-06
	Transport	A2	6.64E-08	0.00502	7.54E-07
	Manufacturing	A3	3.21E-08	0.0012	3.03E-07
	Total (of product stage)	A1-3	—	—	—
Construction process stage	Transport	A4	4.69E-08	0.00368	5.39E-07
	Construction	A5	4.41E-06	0.0047	1.24E-07
Use stage	Use	B1	MND	MND	MND
	Maintenance	B2	MND	MND	MND
	Repair	B3	MND	MND	MND
	Replacement	B4	MND	MND	MND
	Refurbishment	B5	MND	MND	MND
	Operational energy use	B6	MND	MND	MND
	Operational water use	B7	MND	MND	MND
End of life	Deconstruction, demolition	C1	MND	MND	MND
	Transport	C2	5.81E-09	0.000459	6.69E-08
	Waste processing	C3	MND	MND	MND
	Disposal	C4	9.29E-09	0.0837	1.65E-07
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND

HWD = Hazardous waste disposed;
NHWD = Non-hazardous waste disposed;
RWD = Radioactive waste disposed

LCA Results (continued)

Other environmental information describing output flows – at end of life						
			CRU	MFR	MER	EE
			kg	kg	kg	MJ per energy carrier
Product stage	Raw material supply	A1	INA	INA	INA	INA
	Transport	A2	INA	INA	INA	INA
	Manufacturing	A3	INA	INA	INA	INA
	Total (of product stage)	A1-3	—	—	—	—
Construction process stage	Transport	A4	INA	INA	INA	INA
	Construction	A5	INA	INA	INA	INA
Use stage	Use	B1	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND
End of life	Deconstruction, demolition	C1	MND	MND	MND	MND
	Transport	C2	INA	INA	INA	INA
	Waste processing	C3	MND	MND	MND	MND
	Disposal	C4	INA	INA	INA	INA
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	Transportation of product using an average weighted distance from the manufacturing site to all customers.		
	Fuel consumption / Vehicle type (heavy duty vehicle)	litres / km	0.488
	Distance	km	306
	Capacity utilisation (incl. empty returns)	%	65 - 86
	Bulk density of transported products	kg / m^3	1.28 – 1.33
A5 – Installation in the building	Application tools and residual paint and packaging waste during installation.		
	Ancillary materials for installation: Brush for application	g / litre	2.8
	Ancillary materials for installation: Roller for application	g / m^2	4
	Waste materials from installation: Brush disposal	g / litre	2.8
	Waste materials from installation: Dust sheet disposal	g / litre	22.6
	Waste materials from installation: Paint lost in spills and residue	%	1
	Waste materials from installation: Disposal of primary pacakaging	g / litre	42.5 – 65.6
	Waste materials from installation: Disposal of secondary packaging	g / litre	4.6 – 5.1
Reference service life	The service life of the product is linked to the use environment and decorative tastes of the end user and is highly variable.		
C2 – End of life, transport	Average distance from installed site to waste management facility.		
	Fuel consumption / Vehicle type (heavy duty vehicle)	litres / km	0.488
	Distance	km	40
	Capacity utilisation (incl. empty returns)	%	50 - 80
	Bulk density of transported products	kg / m^3	1.28 – 1.33
C4 – End of life, disposal	Waste to recycling	g / litre	83.75 – 83.97
	Waste to landfill	g / litre	13.07 – 13.11

Summary, comments and additional information

Interpretation

The majority of impacts associated with paint products relate to the materials that compose the paint itself (A1, Figure 3). This is expected and is consistent with other analyses of paint products whereby the actions of Crown Paints are the last of a supply chain of material production (i.e. energy inputs, raw materials use, processing). Crown Paints' use of these materials is relatively small by comparison as the production site for these products only mixes existing materials into the final product (Figure 1).

The single most significant environmental impacts of Crown Paints' products come from the use of titanium dioxide as a raw material ingredient (Figure 2). This material is used to create opacity and is used widely in all paint products. Depending on the colour of paint, the amount of titanium dioxide will vary and thus the impacts between shades can be significant (Figure 3). It Is typical of this material to be the highest impact component of paint throughout its lifecycle as it has high impact intensity and can make up a high proportion of the paint formulation.

All of the products assessed in this LCA are water-based and therefore have minimal impacts during the application stage of the product (A5, Figure 4). The majority of impacts occur in the application materials – such as drop sheets and rollers – and these impacts in reference to the functional unit of the study are quite small (Figure 1).

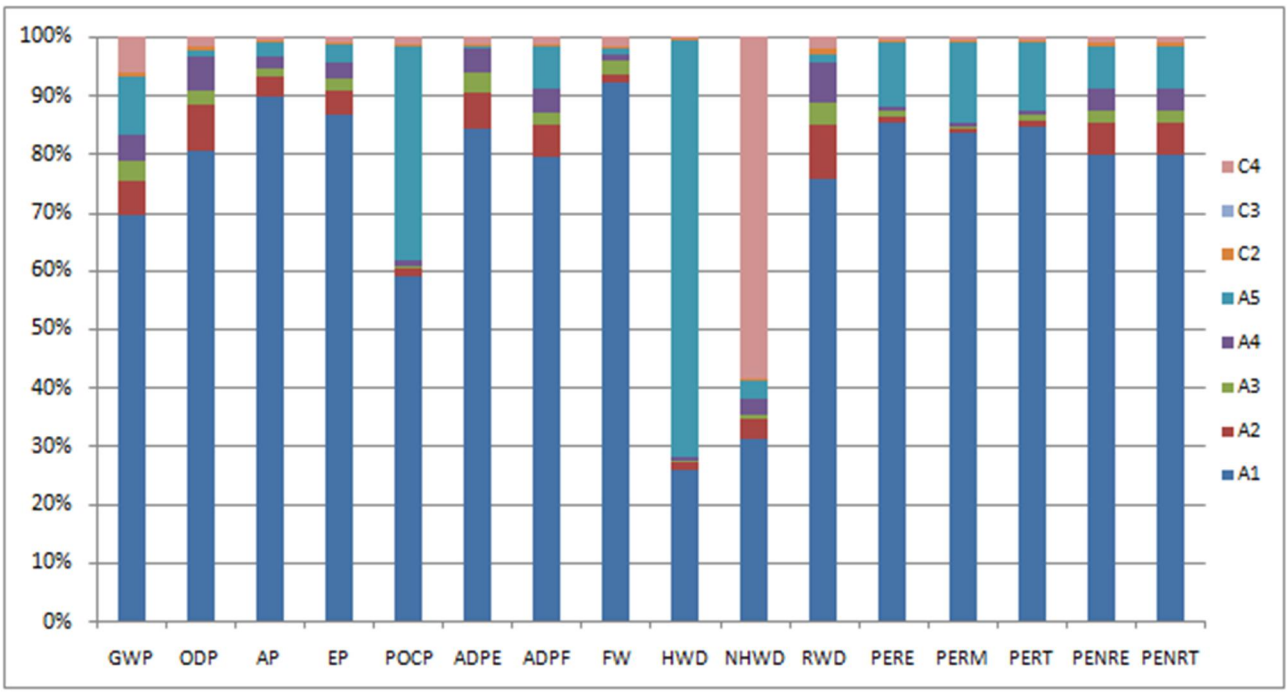


Figure 1

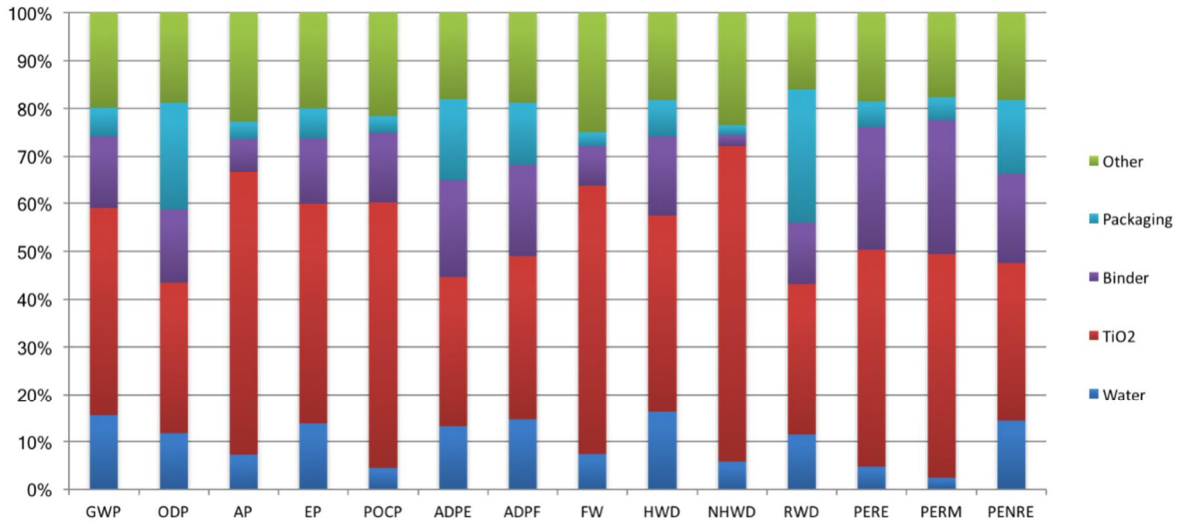


Figure 2

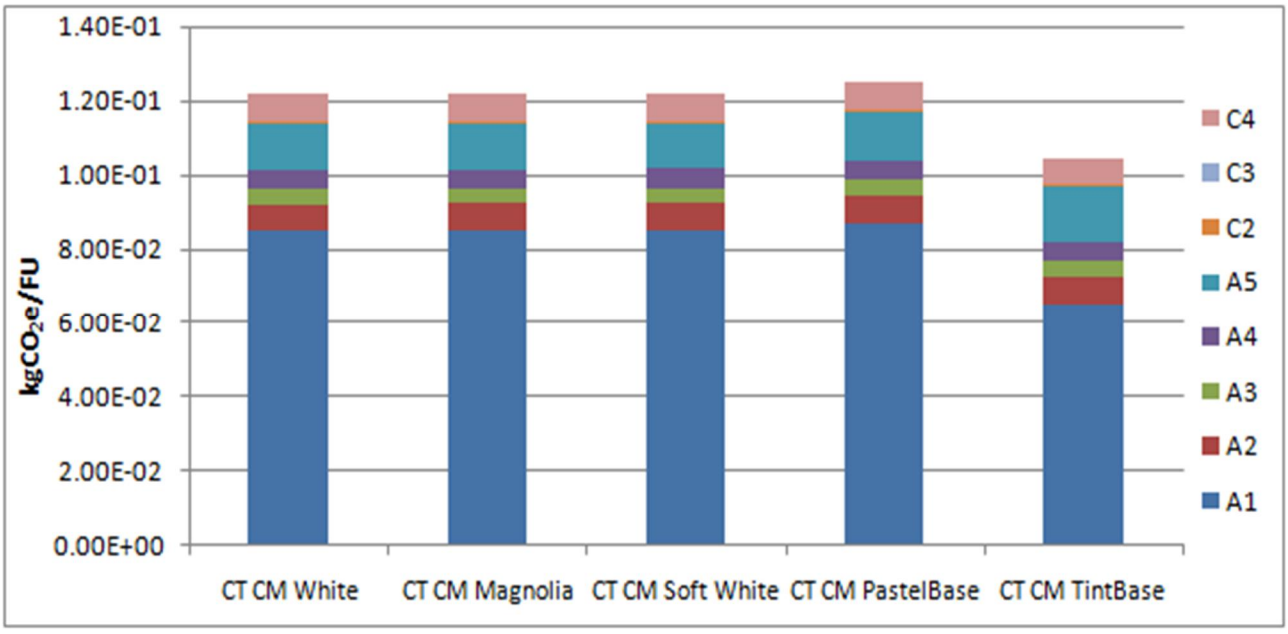


Figure 3

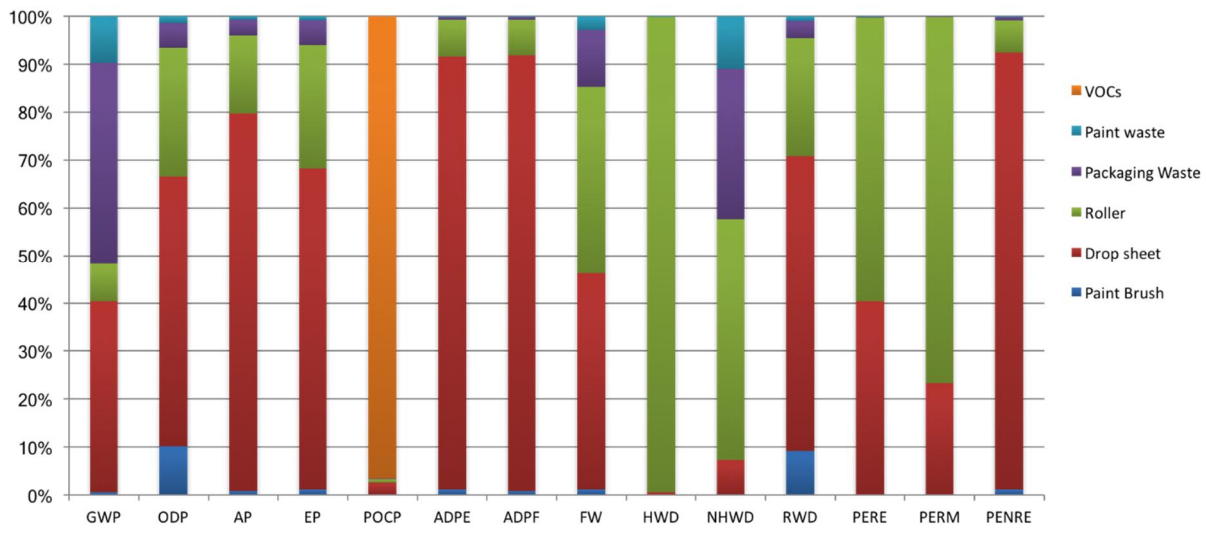


Figure 4

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