KELLY-MOORE® PAINTS

Environmental Product Declaration

AcryPlex®

Interior Paint & Enamels

ASTM INTERNATIONAL
Standards Worldwide

EPD IMPACT SUMMARY

Company name	Kelly-Moore Paint Co., Inc.
Product type	Interior paints
Product name	**Acryplex Interior Paints**
Product definition	AcryPlex is a family of premium quality interior paints and enamels designed to provide a luxurious, self-priming finish in a durable 100% acrylic, low VOC formulation. Excellent for use on walls, ceilings, and trim in residential and commercial applications. AcryPlex can be used on drywall, plaster, masonry, metal, wood and hardboard. Ideal for living rooms, bedrooms, offices, classrooms and much more. Available in flat, eggshell, satin and semi-gloss finishes with a full range of color options.
Product Category Rule (PCR)	PCR for Architectural Coatings: NAICS 325510
Certification Period	May, 2022
Functional Unit	1m^2 of covered and protected substrate for a period of 60 years (the assumed average lifetime of a building).
ASTM Declaration Number	313

In order to support comparative assertions, this EPD meets all comparability requirements stated in ISO 14025:2006. However, differences in certain assumptions, data quality, and variability between LCA data sets may still exist. As such, caution should be exercised when evaluating EPDs from different manufacturers, as the EPD results may not be entirely comparable. Any EPD comparison must be carried out at the building level per ISO 21930 guidelines. The results of this EPD reflect an average performance by the product and its actual impacts may vary on a case-to-case basis.

EPD Information	
Program Operator	ASTM International
Declaration Holder	Kelly-Moore Paint Co., Inc. 1390 El Camino Real 3rd Floor, San Carlos, CA 94070 +1 650-592-8337 TAlvarez@kellymoore.com www.kellymoore.com
Product	Acryplex Interior Paints
Date of Issue	May, 2022
Period of Validity	5 years
Declaration Number	313
Declaration Type	Cradle to grave EPD
Applicable Countries	North America
This EPD was independently verified by ASTM in accordance with ISO 14025: Internal External X	Signature of ASTM Representative  Name and contact information for representative Timothy S Brooke ASTM International 100 Barr Harbor Drive

	West Conshohocken, PA 19428 tbrooke@astm.org
This life cycle assessment was critically reviewed in accordance with ISO 14044 and the reference PCR	Signature of LCA Representative  Name and contact information for representative Thomas P. Gloria, Ph. D. Industrial Ecology Consultants 35 Bracebridge Rd. Newton, MA 02459-1728 t.gloria@industrial-ecology.com

LCA Information	
Basis LCA	Cradle to Grave of Latex Paints
LCA Preparer	Sphera Solutions 130 E Randolp St., Suite 2900 Chicago, IL 60601 USA +1 866-203-3791 www.spherasolutions.com
This life cycle assessment was critically reviewed in accordance with ISO 14044	Signature of LCA Representative  Name and contact information for representative Thomas P. Gloria, Ph. D. Industrial Ecology Consultants 35 Bracebridge Rd. Newton, MA 02459-1728 t.gloria@industrial-ecology.com

PCR Information	
Program operator	NSF International National Center for Sustainability Standards
Reference PCR	PCR for Architectural Coatings: NAICS 325510
Date of issue	June 23, 2017
PCR review was conducted by:	Thomas P. Gloria, Ph. D. Industrial Ecology Consultants 35 Bracebridge Rd. Newton, MA 02459-1728 t.gloria@industrial-ecology.com Mr. Bill Stough Sustainable Research Group PO Box 1684 Grand. Rapids, MI 49501-1684 bstough@sustainableresearchgroup.com Dr. Michael Overcash Environmental Clarity 2908 Chipmunk Lane. Raleigh, NC 27607-3117 mrovercash@earthlink.net

Acryplex Interior Paints EPD - Kelly-Moore

This document is a Type III environmental product declaration by Kelly-Moore that is certified by ASTM International (ASTM) as conforming to the requirements of ISO 14025. ASTM has assessed that the Life Cycle Assessment (LCA) information fulfills the requirements of ISO 14040 in accordance with the instructions listed in the product category rules cited above. The intent of this document is to further the development of environmentally compatible and sustainable construction methods by providing comprehensive environmental information related to potential impacts in accordance with international standards.

PRODUCT DEFINITION

AcryPlex is a family of premium quality interior paints and enamels designed to provide a luxurious, self-priming finish in a durable 100% acrylic, low VOC formulation.

Declared Product Description

The Acryplex Interior Paints follows the description "A decorative or protective paint or coating that is formulated for interior or exterior architectural substances including, but not limited to: drywall, stucco, wood, metal, concrete, and masonry." It includes the following sheens: 1602 Flat, 1610 Eggshell, 1640 Satin, 1650 Semi-Gloss. Gallon and five-gallon containers available in a full range of colors. See www.KellyMoore.com for more information.

Table 1. List of Acryplex Interior Paints Formulas Assessed by LCA Model and Report

	1602	1610	1640	1650
Sheen	Flat	Eggshell	Satin	Semi-Gloss
%@60°	<5	10-20	20-35	40-55
VOC	<2 g/L	<2 g/L	<2 g/L	<2 g/L
Solids Weight	36-63%	46-53%	40-52%	44-50%
Solids Volume	29-45%	37-39%	35-39%	38-39%

Table 2. List of Acryplex Interior Paints Base Types Assessed by LCA Model and Report

AcryPlex Latex Interior Product Series

		Bases			
Product	**Sheen**	**Light & White**	**Medium**	**Deep**	**Neutral**
1602	Flat	121	222	333	555
1610	Eggshell	121	222	333	555
1640	Satin	121	222	333	555
1650	Semi-Gloss	121	222	333	555

PERFORMANCE ATTRIBUTES

Excellent for use on walls, ceilings, and trim in residential and commercial applications. AcryPlex can be used on drywall, plaster, masonry, metal, wood, and hardboard. Ideal for living rooms, bedrooms, offices, classrooms and much more.

Performance Selection

- Luxurious Appearance
- Low Spatter
- Very Low Odor & VOC
- Self-Priming
- Lifetime Warranty

PRODUCT COMPONENTS RELATED TO LIFE CYCLE ASSESSMENT

The material composition of the paints are in the following range:

Table 3: Material Composition Range in % by mass for Acryplex Interior Paints Product Line

	Minimum [%]	Maximum [%]
Water	50	66
Acrylic resin	19	33
Titanium dioxide	0	7.49
Nepheline syenite	0	10.2
Diatomaceous earth	0	2.9
Talc	0	2.07
Preservative	0.98	1.46
Rheology modifier	1.35	4.94
Coalescent	0.49	3.47
Surfactant	1.40	4.65

The functional unit for the study was covering and protecting 1m^2 of substrate for a period of 60 years (the assumed lifetime of a building). The functional unit and the reference flow required for the functional unit were calculated for both the market life and the design life as prescribed by the PCR. Market life for interior paints is 5 years and design life is based on quality determined by ASTM for scrubbability, burnish resistance, and washability and shown in the table below. If a product performs at different quality levels in the durability tests, then it should be classified using its lowest performance category. Results were calculated for all base and sheen formulations.

Table 4a: Design Life by Coating Type and Quality Designation

Test Type	Test	Substrate	Low Quality	Mid Quality	High Quality
Scrub Resistance	ASTM D2486-06 (2012) e1	Plastic	< 100 scrubs	100 – 400 scrubs	> 400 scrubs
Burnish – 20 cycles	ASTM D6736-08 (2013)	Plastic	Change in gloss ≥20	Change in gloss between 10 – 20	Change in gloss <10
Washability	ASTM D4828-94 (2012) e1	Plastic	Avg. score < 3	Avg. score between 3-7	Avg. score > 7

Table 4b: Design Life by Coating Type and Quality Designation

Coating Type	Low Quality	Mid Quality	High Quality
Interior Paint	3 years	7 years	15 years

Table 5: Design Life- Reference flow, quantity of paint, and lifetime

	Lifetime (years)	Quantity needed during lifetime (kg/Functional Unit)	Tint needed during lifetime (g/Functional Unit)
1602-121	15	0.833	34.8
1602-222	7		
1602-333	15		
1602-555	3		
1610-121	15	0.706	34.4
1610-222	15	0.689	65.9
1610-333	15	0.613	80.6
1610-555	15	0.544	119
1640-121	15	0.72	34.7
1640-222	15	0.648	64.7
1640-333	15	0.589	80
1650-121	15	0.692	34.5
1650-222	15	0.639	66.2
1650-333	15	0.573	80
1650-555	15	0.502	115

Table 6: Market Life- Reference flow, quantity of paint, and lifetime

	Lifetime (years)	Quantity needed during lifetime (kg/Functional Unit)	Tint needed during lifetime (g/Functional Unit)
1602-121	5	2.5	104
1602-222	5		
1602-333	5		
1602-555	5		
1610-121	5	2.12	103
1610-222	5	2.07	198
1610-333	5	1.84	242
1610-555	5	1.63	357
1640-121	5	2.16	104
1640-222	5	1.94	194
1640-333	5	1.77	240
1650-121	5	2.08	104
1650-222	5	1.92	199
1650-333	5	1.72	240
1650-555	5	1.5	346

SCOPE AND BOUNDARIES OF THE LIFE CYCLE ASSESMENT

System Boundaries

The LCA was performed according to ISO 14040 standards. The system is a cradle to grave LCA and includes the following modules as defined in the PCR. The declaration covers the full range of Acryplex Interior Paints sold in the North American market for the reference year 2021.

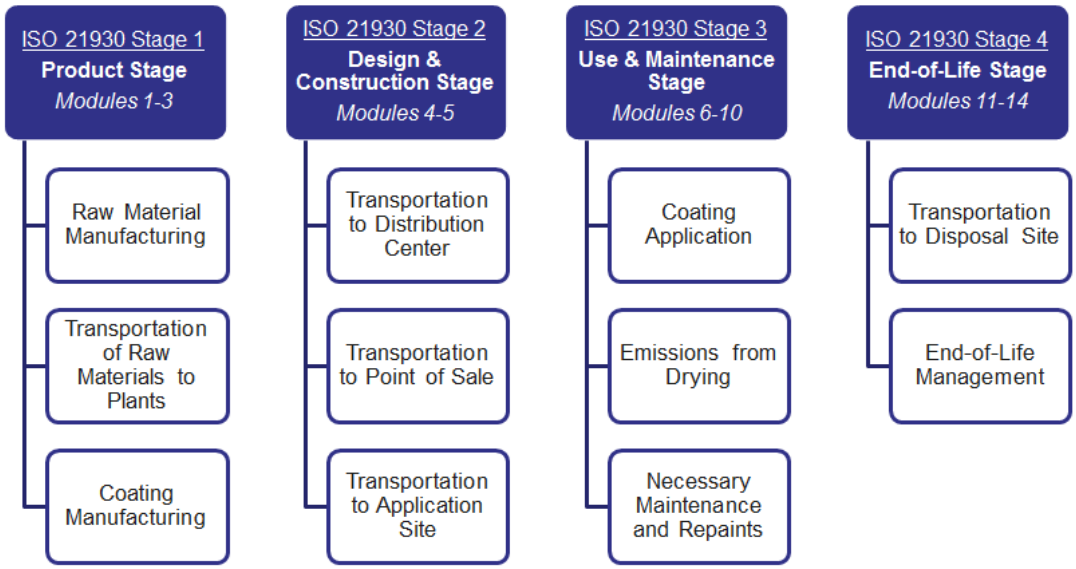

Figure 1: System Boundaries for Cradle to Grave LCA

Assumptions

The described modeling approach makes assumptions in order to represent cradle-to-grave environmental performance of Kelly-Moore latex paint products. These assumptions include those that are prescribed by the PCR, such as in packaging disposal and recovery treatment, as well as transport distances along the life cycle.

Cut-off Criteria

No cut-off criteria are defined by this study. For processes within the system boundary, all available energy and material flow data have been included in the model.

Data Quality

Primary data was obtained from Kelly-Moore's facility at Hurst, TX facility for the 2021 reference year. Background data was obtained from the GaBi 2021 database and are representative of the years 2010 - 2015. Overall, both primary and background data are representative of the product system and have been deemed high quality.

Allocation

Manufacturing inputs for Hurst, TX were allocated to each paint product by mass.

PRODUCT STAGE

Latex paints are produced at Kelly Moore's Hurst, TX production facility according to the following processing steps.

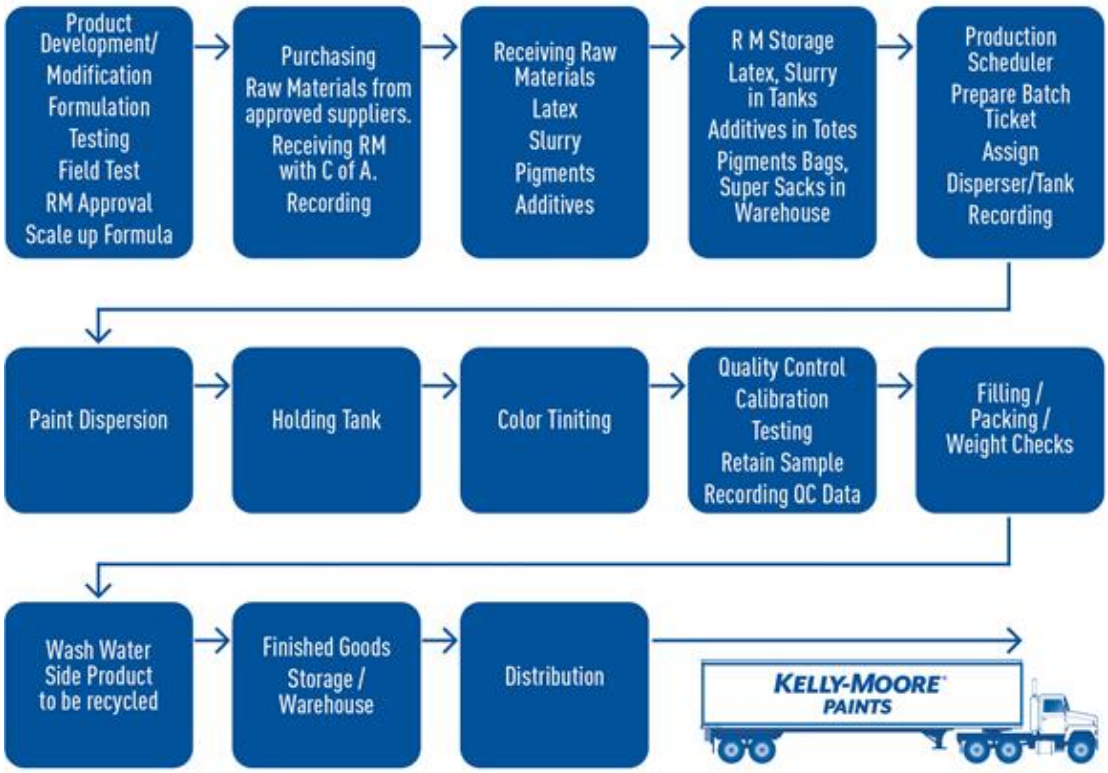

Figure 2: Kelly-Moore Process Flow Schematic

DESIGN AND CONSTRUCTION STAGE

The design and construction stage begins with the packaged paint product leaving the production site and ends with the coating being delivered to the point of application. Within this stage, the paint product is modeled as distributed to a warehouse and from there to point of sale. At point of sale, it is purchased and transported to the point of application. This stage also includes the addition of carbon black colorant at the point of sale, per the PCR.

USE AND MAINTENANCE STAGE

Application and Use

The use stage begins when the user applies the product to a substrate. This stage does not require any energy or additional cleaning inputs, but includes the VOCs emitted over the course of the paint's lifetime. Environmental burdens associated with repaints are attributed to the original stage in which they occurred (e.g. production of the coating for the repaint is attributed to Stage 1 - Product Stage).

Health, Safety and Environmental Aspects During Installation

Customers obtain material from a store or have the store deliver it. The customer or their contractor applies the coating to substrate(s) at customer site(s). The coating remains on the substrate material until the substrate is disposed of. This may include up to a 60-year lifetime, with additional /subsequent protective coatings. If the coating is handled and applied using the recommendations in the safety data sheet and technical data sheet, minimal health and environmental impacts should occur, and maximum product and substrate life should be expected.

Waste
Disposal of any leftover coating and discarded packaging is categorized under the end-of-life stage. A 10% loss rate during application was included per the PCR.

Packaging
Quart and gallon cans are manufactured from plastic and contain 65-70% recycled material. Kelly Moore's 5-gallon bucket requires 10% less resin by mass to produce than typical 5-gallon buckets on the market. This packaging is marked on the bottom for recycling.

END OF LIFE STAGE

Recycling or Reuse
Stores encourage customers to use PaintCare or local recycling programs, and 90 stores in California are PaintCare drop-off sites.

Unused Materials
The manufacturing facility recycle off-spec products, materials and by-products for sale and use outside of Kelly-Moore's standard markets. California stores send off-spec products to be recycled into e-Coat branded paint, which contains 50% pre-consumer and 50% post-consumer recycled paint.

Disposal
Product end-of-life occurs with the disposal of the substrate material. 100% of the waste is disposed of in a landfill at end of life and cannot be separated from the substrate before disposal. Packaging is recovered at a rate of 1.4% for plastics and 70% for metals. Recovery rates represent the average fraction of generated packaging waste that is recovered in the US

LIFE CYCLE IMPACT ASSESSMENT

Key Environmental Parameters

Table 7: LCIA Results for Design Lifetime

	GWP - excl biogenic carbon [kg CO2-Equiv.]	GWP - incl biogenic carbon [kg CO2-Equiv.]	Acidification [kg SO2-Equiv.]	Eutrophication [kg N-Equiv.]	Ozone Depletion Air [kg CFC 11-Equiv.]	Smog formation [kg O3-Equiv.]
1602-121	2.88E00	2.90E00	1.99E-02	5.16E-04	8.77E-10	1.29E-01
1602-222	2.61E-01	2.50E-01	6.02E-04	6.84E-05	3.40E-12	1.83E-02
1602-333	1.15E-01	1.10E-01	2.66E-04	3.02E-05	1.50E-12	8.09E-03
1602-555	4.84E-01	4.64E-01	1.12E-03	1.27E-04	6.31E-12	4.19E-02
1610-121	2.72E00	2.75E00	1.74E-02	4.84E-04	8.61E-10	1.17E-01
1610-222	2.66E00	2.69E00	1.48E-02	4.62E-04	8.25E-10	1.12E-01
1610-333	2.40E00	2.42E00	7.82E-03	4.00E-04	7.85E-10	9.89E-02
1610-555	2.27E00	2.29E00	5.23E-03	3.65E-04	7.23E-10	9.06E-02
1640-121	2.77E00	2.80E00	1.84E-02	4.95E-04	8.71E-10	1.19E-01
1640-222	2.61E00	2.63E00	1.41E-02	4.51E-04	8.10E-10	1.09E-01
1640-333	2.52E00	2.54E00	2.87E-02	4.66E-04	8.20E-10	1.11E-01
1650-121	2.74E00	2.77E00	1.68E-02	4.85E-04	8.64E-10	1.17E-01
1650-222	2.63E00	2.65E00	1.31E-02	4.51E-04	8.24E-10	1.09E-01
1650-333	2.42E00	2.44E00	7.93E-03	4.02E-04	7.80E-10	9.83E-02
1650-555	2.23E00	2.24E00	5.18E-03	3.57E-04	7.02E-10	8.74E-02

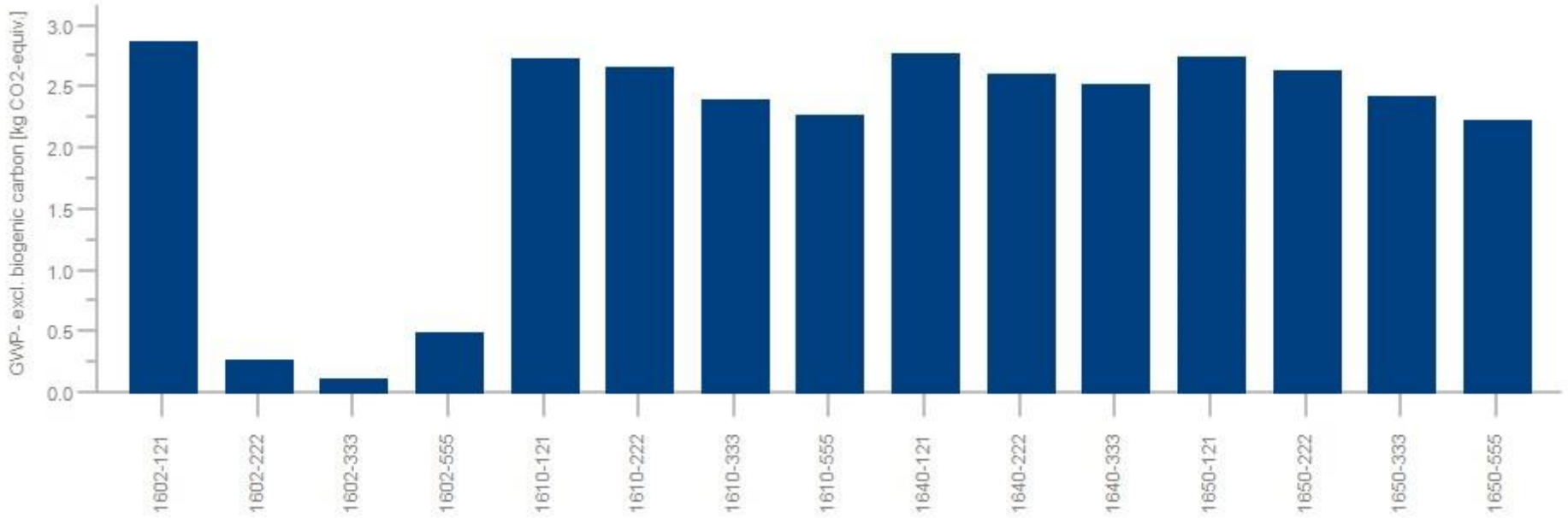

Figure 3: Global Warming Potential, Excluding Biogenic Carbon for Design Lifetime

Table 8: LCIA for Design Lifetime by PCR stages, (Representative Product, 1602-121)

	Stage 1	Stage 2	Stage 3	Stage 4
GWP - excl biogenic carbon [kg CO2-Equiv.]	2.63E00	2.28E-01		2.00E-02
GWP - incl biogenic carbon [kg CO2-Equiv.]	2.66E00	2.24E-01		1.95E-02
Acidification [kg SO2-Equiv.]	1.92E-02	5.91E-04		1.52E-04
Eutrophication [kg N-Equiv.]	4.55E-04	5.05E-05		1.06E-05
Ozone Depletion Air [kg CFC 11-Equiv.]	6.03E-10	7.60E-12		2.66E-10
Smog formation [kg O3-Equiv.]	1.11E-01	1.04E-02	4.49E-03	3.05E-03

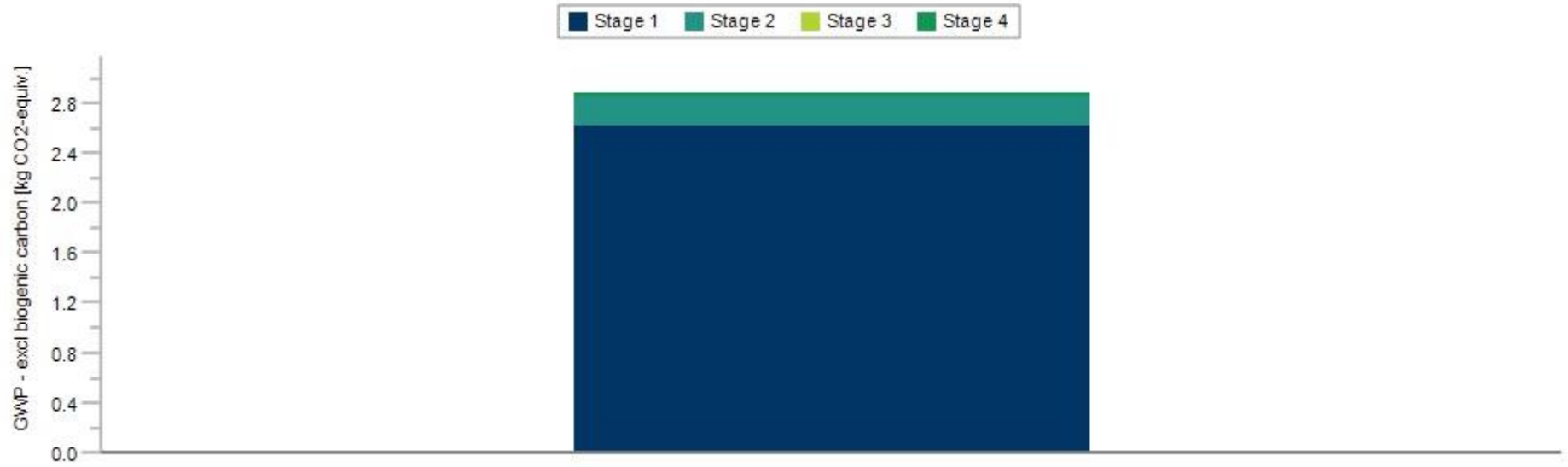

Figure 4: Global Warming Potential, Excluding Biogenic Carbon for Design Lifetime, (Representative Product, #Representative_ Product#

Table 9: LCIA Results for Market Lifetime

	GWP - excl biogenic carbon [kg CO2-Equiv.]	GWP - incl biogenic carbon [kg CO2-Equiv.]	Acidification [kg SO2-Equiv.]	Eutrophication [kg N-Equiv.]	Ozone Depletion Air [kg CFC 11-Equiv.]	Smog formation [kg O3-Equiv.]
1602-121	8.63E00	8.71E00	5.97E-02	1.55E-03	2.63E-09	3.86E-01
1602-222	3.66E-01	3.50E-01	8.43E-04	9.57E-05	4.76E-12	2.56E-02
1602-333	3.46E-01	3.31E-01	7.98E-04	9.06E-05	4.51E-12	2.43E-02
1602-555	2.91E-01	2.78E-01	6.70E-04	7.61E-05	3.79E-12	2.51E-02
1610-121	8.17E00	8.26E00	5.23E-02	1.45E-03	2.58E-09	3.51E-01
1610-222	7.99E00	8.07E00	4.44E-02	1.39E-03	2.48E-09	3.37E-01
1610-333	7.19E00	7.26E00	2.34E-02	1.20E-03	2.35E-09	2.97E-01
1610-555	6.82E00	6.86E00	1.57E-02	1.10E-03	2.17E-09	2.72E-01
1640-121	8.32E00	8.40E00	5.51E-02	1.48E-03	2.61E-09	3.57E-01
1640-222	7.83E00	7.90E00	4.23E-02	1.35E-03	2.43E-09	3.28E-01
1640-333	7.56E00	7.63E00	8.62E-02	1.40E-03	2.46E-09	3.33E-01
1650-121	8.23E00	8.30E00	5.03E-02	1.45E-03	2.59E-09	3.50E-01
1650-222	7.88E00	7.95E00	3.92E-02	1.35E-03	2.47E-09	3.28E-01
1650-333	7.25E00	7.31E00	2.38E-02	1.21E-03	2.34E-09	2.95E-01
1650-555	6.68E00	6.72E00	1.55E-02	1.07E-03	2.11E-09	2.62E-01

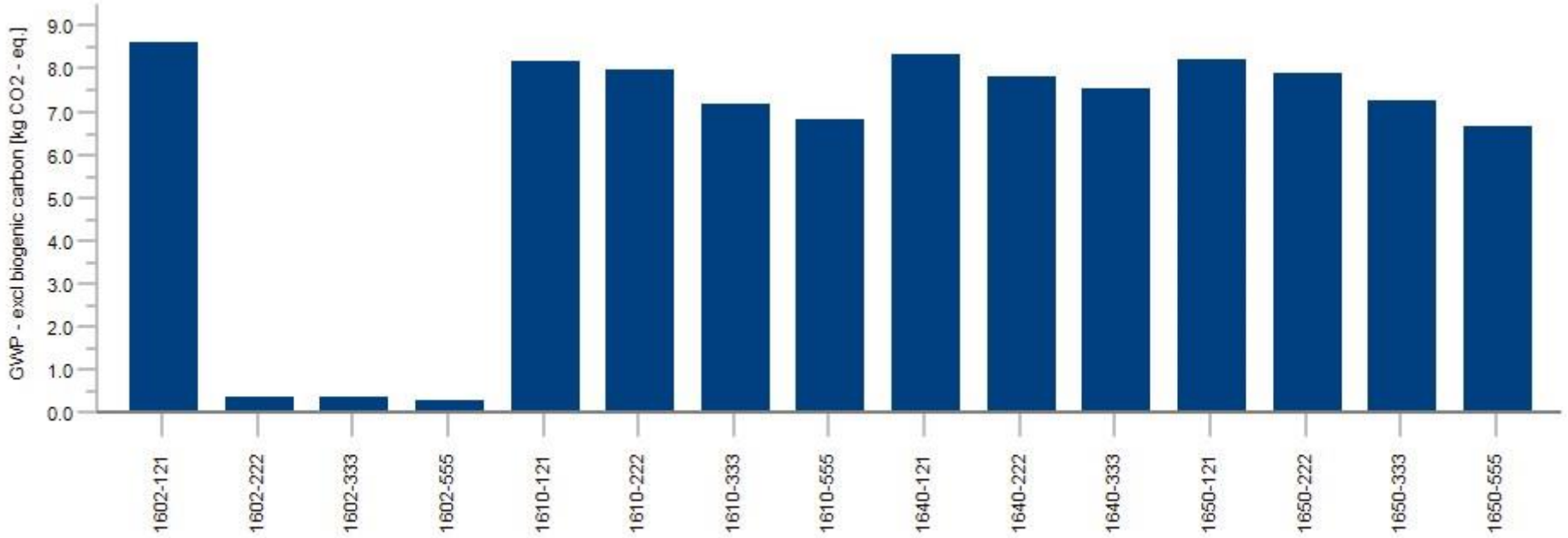

Figure 5: Global Warming Potential, Excluding Biogenic Carbon for Market Lifetime

Table 10: Life Cycle Inventory Data for Market Lifetime, (Representative Product, 1602-121)

	Stage 1	Stage 2	Stage 3	Stage 4
GWP - excl biogenic carbon [kg CO2-Equiv.]	7.89E00	6.84E-01		6.00E-02
GWP - incl biogenic carbon [kg CO2-Equiv.]	7.98E00	6.71E-01		5.86E-02
Acidification [kg SO2-Equiv.]	5.75E-02	1.77E-03		4.56E-04
Eutrophication [kg N-Equiv.]	1.36E-03	1.51E-04		3.19E-05
Ozone Depletion Air [kg CFC 11-Equiv.]	1.81E-09	2.28E-11		7.99E-10
Smog formation [kg O3-Equiv.]	3.32E-01	3.13E-02	1.35E-02	9.14E-03

Material and Energy Resources, Emissions, and Wastes

The additional inventory results required by the PCR for each product are shown in the tables below.

Table 11: Energy Resources for Design Lifetime, (Representative Product, 1602-121) [MJ, net heating value]

Fossil Energy [MJ]	2.44E02
Hydro/Wind Energy [MJ]	3.16E00
Nuclear Energy [MJ]	7.23E00
Other Energy [MJ]	4.14E00

Table 12: Other Environmental Information for Design Lifetime, (Representative Product, 1602-121)

	Stage 1	Stage 2	Stage 3	Stage 4
Consumption of fresh water [m3]	2.28E01	1.09E00		3.50E-02
Hazardous waste (deposited) [kg]	3.46E-08	7.52E-07		9.42E-10
Non-hazardous waste (deposited) [kg]	3.67E-02	4.06E-04		8.94E-01
Recycled materials [kg]				5.03E-03
Secondary raw material [kg]	2.31E-04			
Use of non-renewable material resources [MJ]	1.70E00			
Use of renewable material resources [kg]	2.88E-05			

Table 13: Energy Resources for Market Lifetime, (Representative Product, 1602-121) [MJ, net heating value]

Fossil Energy [MJ]	1.83E02
Hydro/Wind Energy [MJ]	2.37E00
Nuclear Energy [MJ]	5.42E00
Other Energy [MJ]	3.11E00

Table 14: Other Environmental Information for Market Lifetime, (Representative Product, 1602-121)

	Stage 1	Stage 2	Stage 3	Stage 4
Consumption of fresh water [m3]	6.83E01	3.26E00		1.05E-01
Hazardous waste (deposited) [kg]	1.04E-07	2.26E-06		2.82E-09
Non-hazardous waste (deposited) [kg]	1.10E-01	1.22E-03		2.68E00
Recycled materials [kg]				1.51E-02
Secondary raw material [kg]	6.93E-04			
Use of non-renewable material resources [MJ]	5.11E00			
Use of renewable material resources [kg]	8.64E-05			

LCIA Interpretation

For the Acryplex Interior Paints products, raw materials and manufacturing (Stage 1) are the highest contributors to all impact categories. The impact from the design and construction stage is small but not insignificant and can be mostly attributed to transportation. There is a significant portion of smog formation potential from emissions of VOCs during the use stage. Since the amount of repaints and the quality and lifetime of the paints has such a direct impact on the results, any work towards improving the warranty of the product would significantly reduce the impacts as calculated based on design life.

ADDITIONAL ENVIRONMENTAL INFORMATION

Certifications

MPI Approved Products
SCS Global Certification
CRGI Green Wise Certified
CPSCIA Certificate of Compliance

REFERENCES

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