KELLY-MOORE® PAINTS

Environmental Product Declaration

AcryShield®

Premium Exterior Paint & Enamels

100 Barr Harbor Drive
PO Box C700
West Conshohocken, PA
19428-2959
United States.

ASTM INTERNATIONAL
Standards Worldwide

EPD IMPACT SUMMARY

Company name	Kelly-Moore Paint Co., Inc.
Product type	Exterior paints
Product name	**AcryShield Exterior Paints**
Product definition	AcryShield is a family of premium quality exterior paints and enamels designed for excellent weathering and a lasting impression. Created with a 100% acrylic formula to provide outstanding color and gloss retention. Great for use on walls, trim, accents and doors in residential and commercial applications. AcryShield can be used on stucco, masonry, metal, wood and hardboard. Ideal for homes, businesses, schools and much more. Available in flat, low sheen, 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	318

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	AcryShield Exterior Paints
Date of Issue	May, 2022
Period of Validity	5 years
Declaration Number	318
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

AcryShield Exterior 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

AcryShield is a family of premium quality exterior paints and enamels designed for excellent weathering and a lasting impression. Created with a 100% acrylic formula to provide outstanding color and gloss retention.

Declared Product Description

The AcryShield Exterior 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: 1240 Flat, 1245 Low Sheen, 1247 Satin,1250 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 AcryShield Exterior Paints Formulas Assessed by LCA Model and Report

	1240	1245	1247	1250
Sheen	Flat	Low Sheen	Satin	Semi-Gloss
%@60°	<5	5-10	15-25	40-55
VOC	<50 g/L	<50 g/L	<50 g/L	<50 g/L
Solids Weigh	50-56%	47-57%	39-53%	40-47%
Solids Volum	37-42%	37-43%	33-42%	33-39%

Table 2. List of AcryShield Exterior Paints Base Types Assessed by LCA Model and Report

AcryShield 100% Acrylic Exterior Paint Product Series

		Bases			
Product	**Sheen**	**Light & White**	**Medium**	**Deep**	**Neutral**
1240	Flat	121	222	333	555
1245	Low Sheen	121	222	333	555
1247	Satin	121	222	333	555
1250	Semi-Gloss	121	222	333	555

PERFORMANCE ATTRIBUTES

Great for use on walls, trim, accents and doors in residential and commercial applications. AcryShield can be used on stucco, masonry, metal, wood and hardboard. Ideal for homes, businesses, schools and much more.

Performance Selection

- Lasting Impression – (or Long-Lasting Finish)
- Excellent Color & Gloss Retention
- Self Priming
- Dirt & Mildew Resistant
- 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 AcryShield Exterior Paints Product Line

	Minimum [%]	Maximum [%]
Water	52	63
Acrylic resin	13	35
Titanium dioxide	0	6.3
Nepheline syenite	1.11	14
Diatomaceous earth	0	4.2
Talc	0	0
Preservative	1.4	2.8
Rheology modifier	0.68	5.6
Coalescent	1.1	3.9
Surfactant	1.6	3.2

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 exterior paints is 10 years and design life is either based on quality determined by ASTM testing and shown in Table 4 or on the paint warranty. This EPD assumes 10 years based on the exterior paint warranty. Results were calculated for all base and sheen formulations.

Table 4: Design Life by Coating Type and Quality Designation

Coating Type	Low Quality	Mid Quality	High Quality	Alternative
Interior Paint	3 years	7 years	15 years	N/A
Exterior Paint	5 years	10 years	20 years	Warranty

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)
1240-121	50	0.231	10.5
1240-222	50	0.22	20.1
1240-333	50	0.211	24.8
1240-555	50	0.186	37
1245-121	50	0.229	10.5
1245-222	50	0.217	20.1
1245-333	50	0.193	24.6
1245-555	50	0.173	36.7
1247-121	50	0.215	10.5
1247-222	50	0.199	20
1247-333	50	0.18	24.4
1247-555	50	0.159	36.2
1250-121	50	0.206	10.5
1250-222	50	0.192	19.9
1250-333	50	0.173	24.3
1250-555	50	0.155	36.1

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)
1240-121	10	1.15	52.5
1240-222	10	1.1	100
1240-333	10	1.06	124
1240-555	10	0.931	185
1245-121	10	1.14	52.5
1245-222	10	1.08	101
1245-333	10	0.964	123
1245-555	10	0.864	184
1247-121	10	1.07	52.4
1247-222	10	0.994	100
1247-333	10	0.9	122
1247-555	10	0.793	181
1250-121	10	1.03	52.3
1250-222	10	0.959	99.6
1250-333	10	0.864	122
1250-555	10	0.776	181

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 AcryShield Exterior Paints sold in the North American market for the reference year 2021.

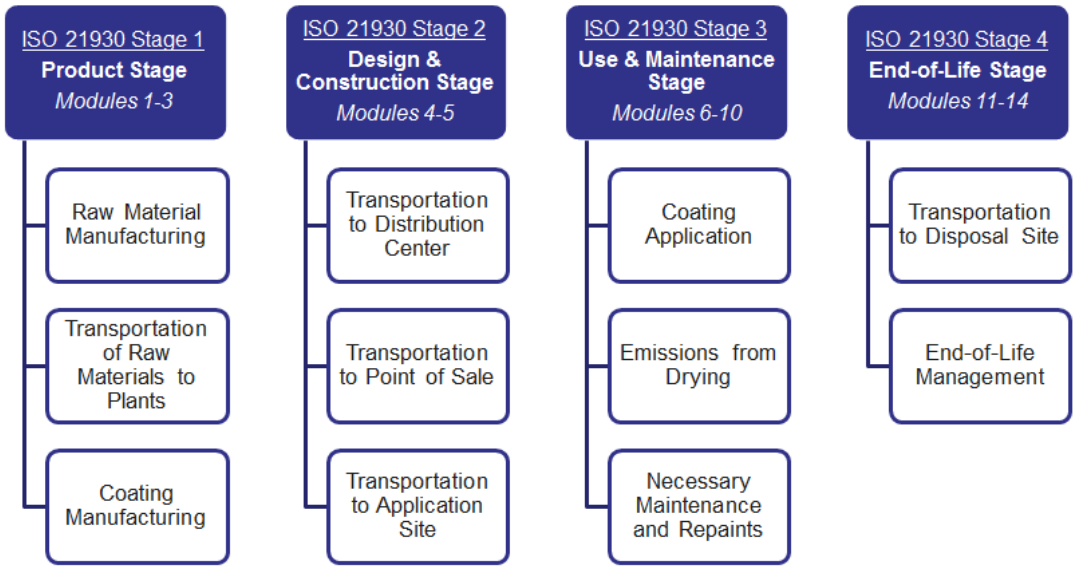

Figure 1: System Boundaries for Cradle to Grave LCA

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.

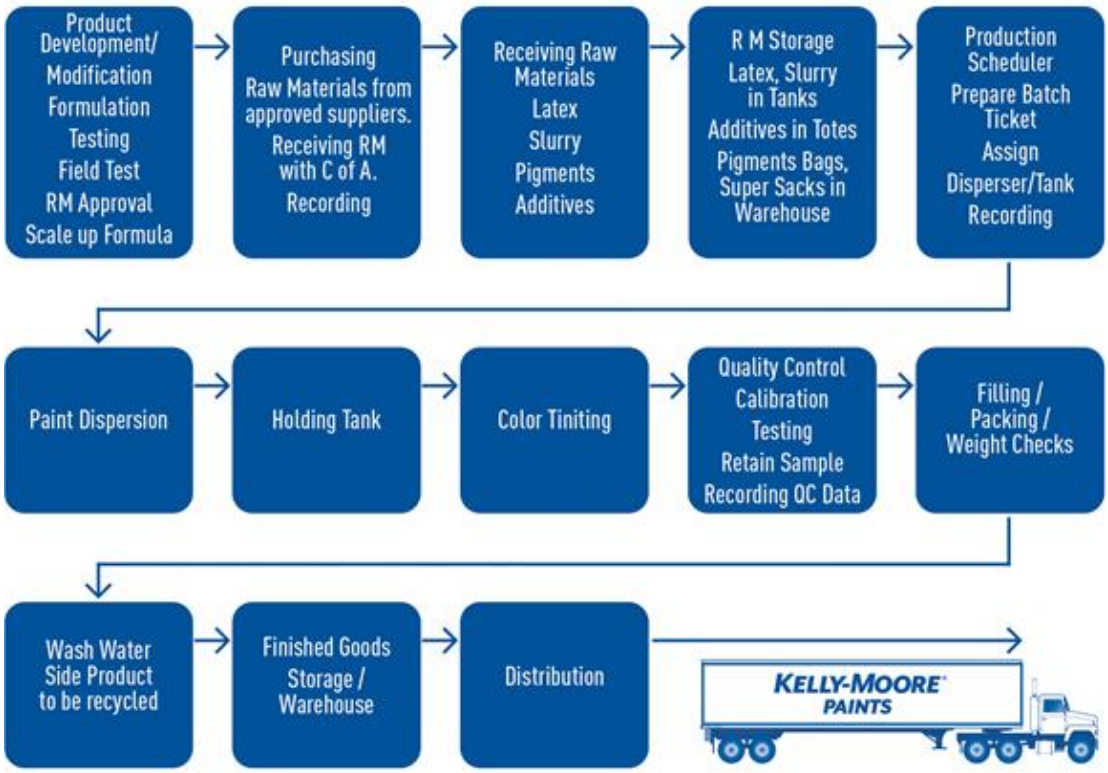

Figure 2: Kelly-Moore Process Flow Schematic

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.]
1240-121	7.82E-01	7.89E-01	4.61E-03	1.38E-04	2.59E-10	4.18E-02
1240-222	7.64E-01	7.71E-01	4.13E-03	1.32E-04	2.48E-10	4.03E-02
1240-333	7.16E-01	7.20E-01	2.34E-03	1.20E-04	2.39E-10	3.87E-02
1240-555	6.73E-01	6.77E-01	1.53E-03	1.08E-04	2.22E-10	3.66E-02
1245-121	8.11E-01	8.19E-01	5.08E-03	1.43E-04	2.61E-10	4.38E-02
1245-222	7.93E-01	7.99E-01	4.59E-03	1.37E-04	2.50E-10	4.27E-02
1245-333	7.05E-01	7.09E-01	2.35E-03	1.16E-04	2.37E-10	3.82E-02
1245-555	6.73E-01	6.77E-01	1.54E-03	1.07E-04	2.21E-10	3.62E-02
1247-121	8.07E-01	8.14E-01	4.87E-03	1.41E-04	2.60E-10	4.32E-02
1247-222	7.79E-01	7.85E-01	4.09E-03	1.34E-04	2.48E-10	4.13E-02
1247-333	6.93E-01	6.97E-01	2.38E-03	1.15E-04	2.35E-10	3.69E-02
1247-555	6.51E-01	6.55E-01	1.49E-03	1.04E-04	2.18E-10	3.44E-02
1250-121	8.20E-01	8.27E-01	4.65E-03	1.44E-04	2.60E-10	4.19E-02
1250-222	7.93E-01	7.99E-01	3.93E-03	1.36E-04	2.48E-10	4.01E-02
1250-333	7.21E-01	7.25E-01	2.47E-03	1.20E-04	2.36E-10	3.73E-02
1250-555	6.98E-01	7.02E-01	1.63E-03	1.11E-04	2.20E-10	3.65E-02

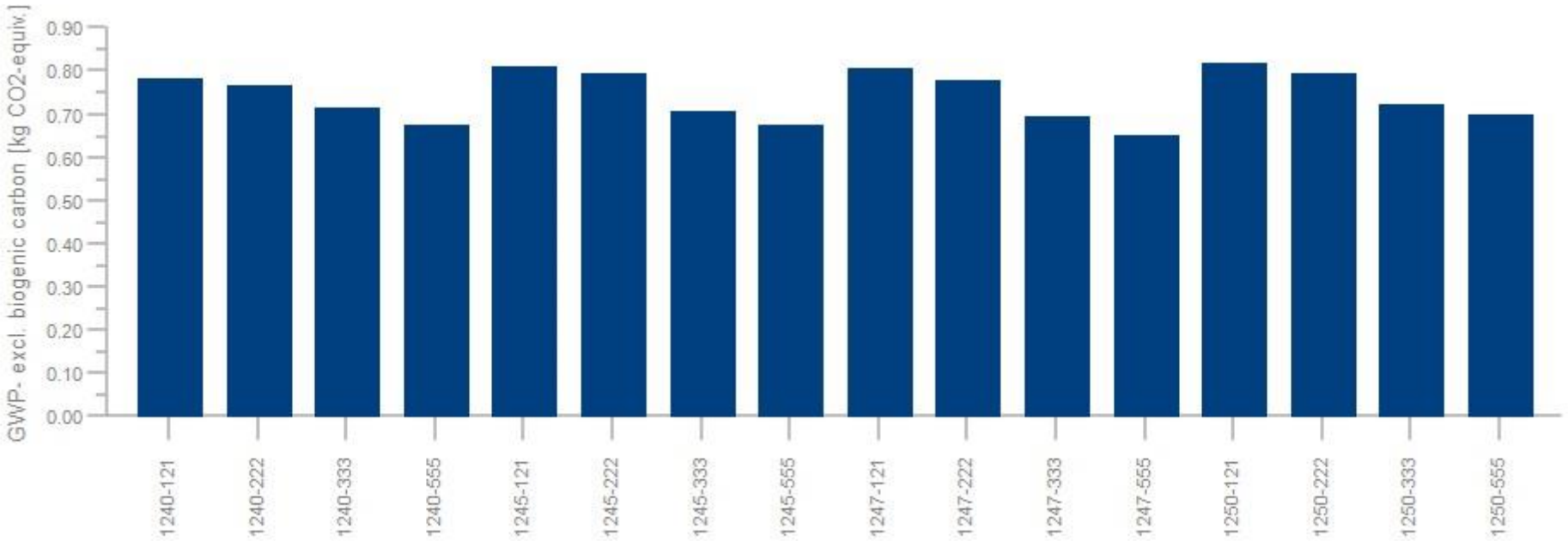

Figure 3: Global Warming Potential, Excluding Biogenic Carbon for Design Lifetime

Table 8: LCIA for Design Lifetime by PCR stages, (Representative Product, 1240-121)

	Stage 1	Stage 2	Stage 3	Stage 4
GWP - excl biogenic carbon [kg CO2-Equiv.]	7.11E-01	6.58E-02		4.97E-03
GWP - incl biogenic carbon [kg CO2-Equiv.]	7.20E-01	6.46E-02		4.84E-03
Acidification [kg SO2-Equiv.]	4.40E-03	1.71E-04		4.10E-05
Eutrophication [kg N-Equiv.]	1.21E-04	1.43E-05		2.93E-06
Ozone Depletion Air [kg CFC 11-Equiv.]	1.76E-10	2.26E-12		8.03E-11
Smog formation [kg O3-Equiv.]	2.97E-02	2.97E-03	8.38E-03	8.22E-04

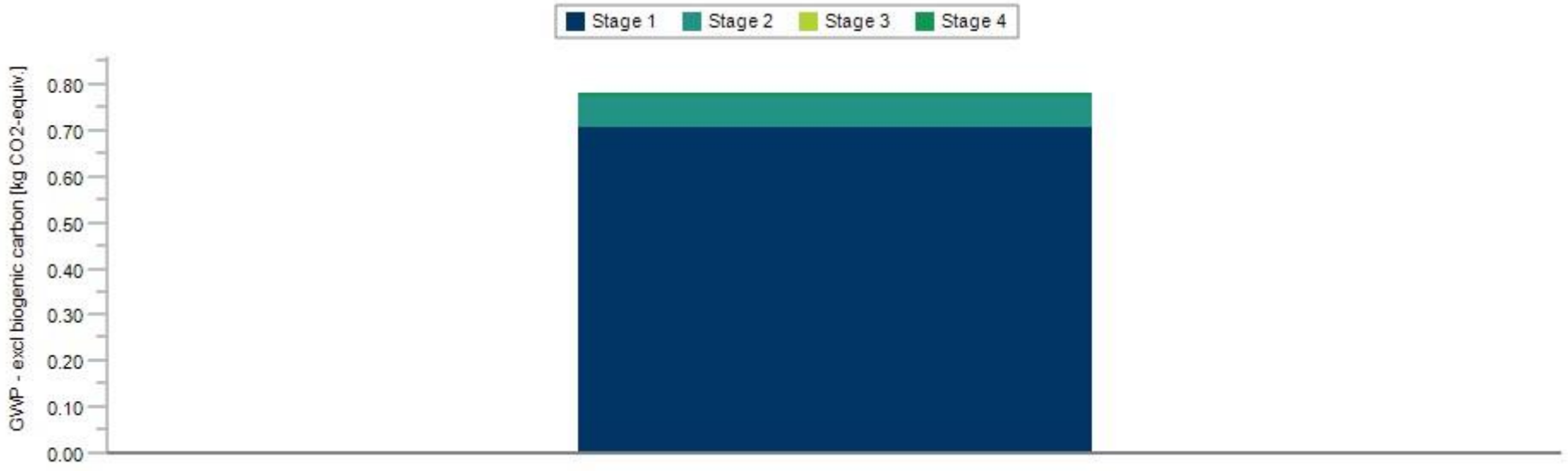

Figure 4: Global Warming Potential, Excluding Biogenic Carbon for Design Lifetime, (Representative Product, #Representative_ Product#)

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.]
1240-121	3.91E00	3.95E00	2.30E-02	6.90E-04	1.29E-09	2.09E-01
1240-222	3.82E00	3.85E00	2.06E-02	6.60E-04	1.24E-09	2.01E-01
1240-333	3.58E00	3.60E00	1.17E-02	5.99E-04	1.20E-09	1.94E-01
1240-555	3.36E00	3.39E00	7.65E-03	5.41E-04	1.11E-09	1.83E-01
1245-121	4.06E00	4.09E00	2.54E-02	7.14E-04	1.31E-09	2.19E-01
1245-222	3.96E00	4.00E00	2.30E-02	6.84E-04	1.25E-09	2.13E-01
1245-333	3.52E00	3.55E00	1.17E-02	5.82E-04	1.19E-09	1.91E-01
1245-555	3.36E00	3.38E00	7.69E-03	5.34E-04	1.11E-09	1.81E-01
1247-121	4.04E00	4.07E00	2.44E-02	7.07E-04	1.30E-09	2.16E-01
1247-222	3.89E00	3.92E00	2.05E-02	6.68E-04	1.24E-09	2.06E-01
1247-333	3.46E00	3.48E00	1.19E-02	5.75E-04	1.18E-09	1.84E-01
1247-555	3.26E00	3.27E00	7.45E-03	5.19E-04	1.09E-09	1.72E-01
1250-121	4.10E00	4.13E00	2.32E-02	7.20E-04	1.30E-09	2.09E-01
1250-222	3.96E00	4.00E00	1.97E-02	6.81E-04	1.24E-09	2.01E-01
1250-333	3.60E00	3.63E00	1.23E-02	5.99E-04	1.18E-09	1.86E-01
1250-555	3.49E00	3.51E00	8.14E-03	5.57E-04	1.10E-09	1.82E-01

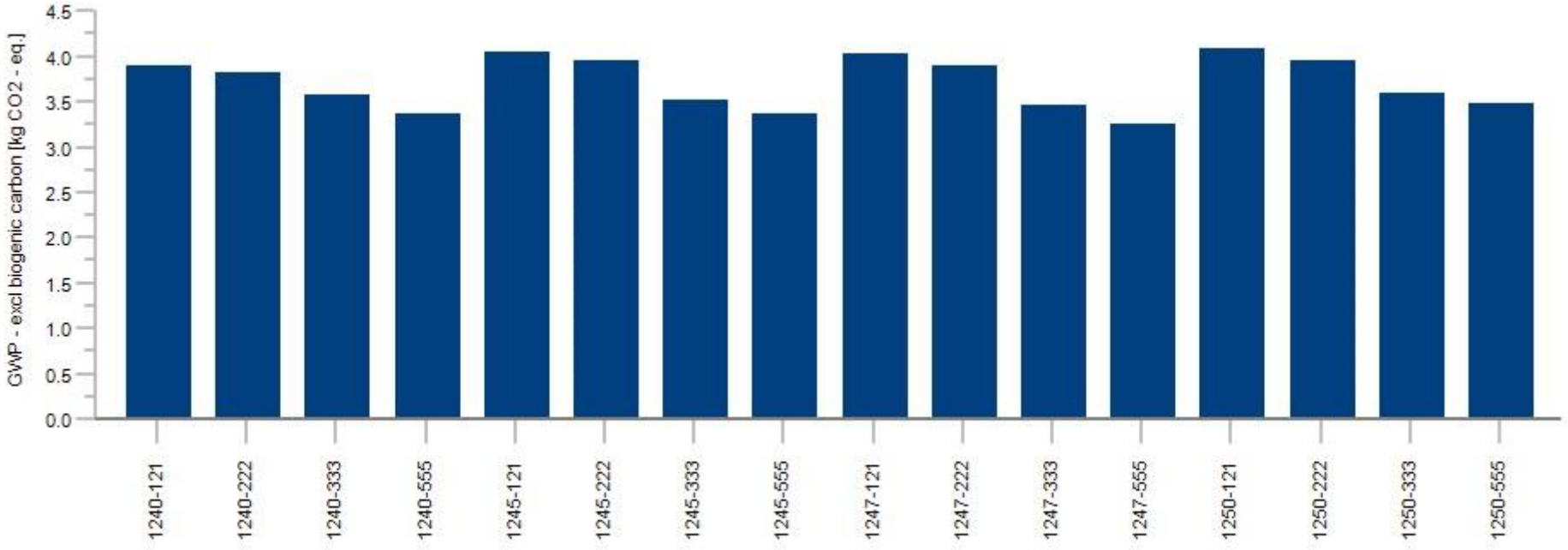

Figure 5: Global Warming Potential, Excluding Biogenic Carbon for Market Lifetime

Table 10: Life Cycle Inventory Data for Market Lifetime, (Representative Product, 1240-121)

	Stage 1	Stage 2	Stage 3	Stage 4
GWP - excl biogenic carbon [kg CO2-Equiv.]	3.56E00	3.29E-01		2.48E-02
GWP - incl biogenic carbon [kg CO2-Equiv.]	3.60E00	3.23E-01		2.42E-02
Acidification [kg SO2-Equiv.]	2.20E-02	8.56E-04		2.05E-04
Eutrophication [kg N-Equiv.]	6.04E-04	7.14E-05		1.46E-05
Ozone Depletion Air [kg CFC 11-Equiv.]	8.80E-10	1.13E-11		4.02E-10
Smog formation [kg O3-Equiv.]	1.48E-01	1.48E-02	4.19E-02	4.11E-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, 1240-121) [MJ, net heating value]

Fossil Energy [MJ]	1.01E02
Hydro/Wind Energy [MJ]	1.27E00
Nuclear Energy [MJ]	2.90E00
Other Energy [MJ]	1.73E00

Table 12: Other Environmental Information for Design Lifetime, (Representative Product, 1240-121)

	Stage 1	Stage 2	Stage 3	Stage 4
Consumption of fresh water [m3]	6.44E00	3.15E-01		8.03E-03
Hazardous waste (deposited) [kg]	9.39E-09	2.10E-07		2.53E-10
Non-hazardous waste (deposited) [kg]	1.06E-02	1.17E-04		2.47E-01
Recycled materials [kg]				1.52E-03
Secondary raw material [kg]	6.97E-05			
Use of non-renewable material resources [MJ]	3.37E-01			
Use of renewable material resources [kg]	8.69E-06			

Table 13: Energy Resources for Market Lifetime, (Representative Product, 1240-121) [MJ, net heating value]

Fossil Energy [MJ]	8.44E01
Hydro/Wind Energy [MJ]	1.06E00
Nuclear Energy [MJ]	2.42E00
Other Energy [MJ]	1.45E00

Table 14: Other Environmental Information for Market Lifetime, (Representative Product, 1240-121)

	Stage 1	Stage 2	Stage 3	Stage 4
Consumption of fresh water [m3]	3.22E01	1.58E00		4.02E-02
Hazardous waste (deposited) [kg]	4.69E-08	1.05E-06		1.26E-09
Non-hazardous waste (deposited) [kg]	5.29E-02	5.85E-04		1.23E00
Recycled materials [kg]				7.59E-03
Secondary raw material [kg]	3.48E-04			
Use of non-renewable material resources [MJ]	1.68E00			
Use of renewable material resources [kg]	4.34E-05			

LCIA Interpretation

For the AcryShield Exterior 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
CPSCIA Certificate of Compliance

REFERENCES

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