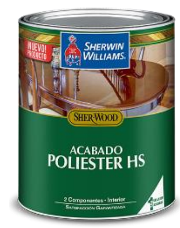
Environmental Product Declaration – Sher-Wood® Polyester HS Finish [1]

Certified Environmental Product Declaration
www.nsf.org

Sher-Wood® Polyester HS Finish is a two-component finish for interior use, with high solid polyester technology to achieve finishes that accomplish the highest standards of strength and durability, with outstanding hardness and mechanical properties. Available in gloss, satin and matte finish.



The product image to the right is an example of a Sher-Wood® Polyester HS Finish product. The relevant Sher-Wood® Polyester HS Finish formula is shown in Table 1 on page 2 of the EPD.

Program Operator	NSF Certification LLC
Declaration Holder	The Sherwin-Williams Company
Declaration Prepared by	Doug Mazeffa (douglas.p.mazeffa@sherwin.com)
Declaration Number	EPD10287
Declared Product	Sher-Wood® Polyester HS Finish
Product Category and Subcategory	Architectural Coatings – Interior Coatings
Program Operator	NSF Certification LLC ncss@nsf.org
Reference PCR	PCR for Architectural Coatings – 7-18-2015

Date of Issue	1/10/2020
Period of Validity	5 Years

Contents of the Declaration	– Product definition and material characteristics – Overview of manufacturing process – Information about in-use conditions – Life cycle assessment results – Testing verifications

The PCR review was conducted by	Thomas P. Gloria, Ph. D. t.gloria@industrial-ecology.com

This EPD was independently verified by NSF Certification LLC in accordance with ISO 21930 and ISO 14025. ☐ **Internal** ☒ **External**	Jenny Oorbeck joorbeck@nsf.org
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by	Jack Geibig - EcoForm jgeibig@ecoform.com

Functional Unit:	1m² of covered and protected substrate for a period of 60 years (the assumed average lifetime of a building)
Market-Based Lifetime Used in Assessment	5 years
Design Lifetime Used in Assessment	N/A
Test Methods Used to Calculate Design Life	ASTM D2805-11, ASTM D714-02, ASTM D662-93, ASTM D772-86, ASTM D3274
Estimated Amount of Colorant	Varies (see Table 2)
Data Quality Assessment Score	Good
Manufacturing Location(s)	United States and Central America
Software Program Used	GaBi (most recent version available at time of report)

[1] *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 perT 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.*

Product Definition:

Sher-Wood® Polyester HS Finish is an interior architectural coating manufactured by The Sherwin-Williams Company, headquartered in Cleveland, Ohio, or its authorized licensee Sherwin-Williams de Centro America ("SWCA"). Sher-Wood® Polyester HS Finish is manufactured in a number of Sherwin-Williams facilities and the data used by the LCA were representative of all facilities in which Sher-Wood® Polyester HS Finish was produced. This coating is designed to cover and protect architectural surfaces such as walls and ceilings. For information about specific products, please visit www.sherwin.com.
In the Central America region please visit the SWCA website at www.sherwinca.com.

Product Classification and Description:

The Sher-Wood® Polyester HS Finish products listed below are included within this assessment. For information on other attributes of Sher-Wood® Polyester HS Finish, please visit www.sherwin.com.

Table 1. List of Sher-Wood® Polyester HS Finish Formulas Assessed by LCA Model and Report.

Product Number	Sheen	Base Type as Defined by PCR
F64CSA1	Varnish	Primer
F64FSA1	Varnish	Primer

Under the Product Category Rule (PCR) for Architectural Coatings, Sher-Wood® Polyester HS Finish falls under the following heading:

- "a decorative or protective paint or coating that is formulated for interior or exterior architectural substrates including, but not limited to: drywall, stucco, wood, metal, concrete, and masonry."

Architectural coatings are manufactured in a way similar to other paint and coating products. Raw materials are manually added in appropriate quantities into a high-speed disperser which are mixed. The product is then moved via compressed air or gravity and filled into containers and transported to the distribution center and finally to the point of sale. A customer travels to the store to purchase the product and transports the coating to the site where it is applied. The applied coating adheres to the substrate where it remains until the substrate is disposed. Any unused coating will be disposed by the user as well. Because the functional unit mandates a 60 years product life, multiple repaints were necessary and were accounted for by the LCA models.

The typical composition of Sher-Wood® Polyester HS Finish coating is shown by % weight below.

- Solvent (40%-60%)
- Resin (10%-20%)
- Extender Pigments (0%-30%)
- Methyl Isobutyl Ketone (0%-15%)
- Toluene (0%-20%)
- Xylene (0%-5%)

- Ethylbenzene (0%-2%)
- Light Aromatic Hydrocarbons (0%-2%)
- Acetone (0%-3%)
- Nitrocellulose (0%-3%)
- 1, 2,4-Trimethylbenzene (0%-1%)
- Ethanol (<2%)
- Methanol (<1%)
- Cumene (<0.1%)

Other than the ingredients listed above there are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting. For additional information about product hazards, please refer to the Safety Data Sheet for the Sher-Wood® Polyester HS Finish formula available on the SWCA website at www.sherwinca.com.

About Sherwin-Williams:

For 150 years, Sherwin-Williams has provided contractors, builders, property managers, architects and designers with the trusted products they need to build their business and satisfy customers. Sher-Wood® Polyester HS Finish is just one more way we bring you industry-leading paint technology — innovation you can pass on to your customers. Plus, with more than 4,000 stores and 2,400 sales representatives across North America, personal service and expert advice is always available near jobsites. Find out more about Sher-Wood® Polyester HS Finish at your nearest Sherwin-Williams store or to have a sales representative contact you, call 800-524-5979. For Service in Central America contact Sherwin-Williams' authorized licensee, Sherwin-Williams de Centro America at 503-2133-2300.

Definitions:

Acronyms & Abbreviated Terms:

- **ACA:** American Coating Association
- **ASTM**: A standards development organization that serves as an open forum for the development of international standards. ASTM methods are industry-recognized and approved test methodologies for demonstrating the durability of an architectural coating in the United States.
- **ecoinvent:** a life cycle database that contains international industrial life cycle inventory data on energy supply, resource extraction, material supply, chemicals, metals, agriculture, waste management services, and transport services.
- **EPA WARM model**: Unite States Environmental Protection Agency Waste Reduction Model.
- **EPD**: Environmental Product Declaration. EPDs are form of as Type III environmental declarations under ISO 14025. They are the summary document of data collected in the LCA as specified by a relevant PCR. EPDs can enable comparison between products if the underlying studies and assumptions are similar.
- **GaBi:** Created by PE INTERNATIONAL GaBi Databases are LCA databases that contain ready-to-use Life Cycle Inventory profiles.
- **LCA**: Life Cycle Assessment or Analysis. A technique to assess environmental impacts associated with all the stages of a product's life from cradle to grave (i.e., from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling).
- **NCSS**: NSF Certification LLC’s National Center for Sustainability Standards
- **PCR**: Product Category Rule. A PCR defines the rules and requirements for creating EPDs of a certain product category.
- **TRACI**: Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts.

Terminology:

- **Architectural coating:** a coating recommended for field application to stationary structures or their appurtenances at the site of installation, to portable buildings, to pavements, or to curbs. For purposes of this PCR an ‘architectural coating’ does not include adhesives and coatings for shop applications or original equipment manufacturing, nor does it include coatings solely for application to non-stationary structures, such as airplanes, ships, boats, and railcars. *Please see the product category requirements in Section 1.1 of the PCR.*
- **Biologic growth or bio deterioration:** any undesirable change in material properties brought about by the activities of microorganisms.
- **Blistering**: the formation of dome shaped hollow projections in paints or varnish films resulting from the local loss of adhesion and lifting of the film from the surface or coating.
- **Burnish resistance**: the resistance of a coating to an increase in gloss or sheen due to polishing or rubbing.
- **Design life**: The estimated lifetime of a coating based solely on its hiding and performance characteristics determined by results in certain ASTM durability tests.
- **Durability**: the degree to which coatings can withstand the destructive effect of the conditions to which they are subjected and how long they retain an acceptable appearance and continue to protect the substrate.

- **Erosion:** the wearing away of the top coating of a painted surface e.g., by chalking, or by the abrasive action of windborne particles of grit, which may result in exposure of the underlying surface. The degree of resistance is dependent on the amount of coating retained.
- **Flaking/Peeling**: the phenomenon manifested in paint films by the actual detachment of pieces of the film itself either from its substrate or from paint previously applied. Peeling can be considered as an aggravated form of flaking. It is frequently due to the collection of moisture beneath the film.
- **Gloss:** a value of specular reflection which is often used to categorize certain types of paints.
- **Intermediate processing**: the conversion of raw materials to intermediates (e.g. titanium dioxide ore into titanium dioxide pigment, etc.).
- **Market-based life:** The estimated lifetime of a coating based off the actual use pattern of the product type. In this instance, a repaint may occur before the coating fails.
- **Pigment:** the material(s) that give a coating its color.
- **Primary materials**: resources extracted from nature. Examples include titanium dioxide ore, crude oil, etc. that are used to create basic materials used in the production of architectural coatings (e.g., titanium dioxide).
- **Resin/Binder:** acts as the glue or adhesive to adhere the coating to the substrate.
- **Scrubbability or scrub resistance:** the ability of a coating to resist being worn away or to maintain its original appearance when rubbed repetitively with an abrasive material.
- **Secondary materials**: recovered, reclaimed, or recycled content that is used to create basic materials to be used in the production of architectural coatings.
- **Washability:** the ease with which the dirt can be removed from a paint surface by washing; also refers to the ability of the coating to withstand washing without removal or substantial damage.

Underlying Life Cycle Assessment Methodology:

Functional Unit:

Per the reference PCR, 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 product has no additional functionalities beyond what is stated by the functional unit.

In the reference PCR, product life for interior architectural coatings was calculated both in terms of a typical market life (5 years) and a technical life (either 3,7, or 15 years depending on performance in certain durability tests/methodologies prescribed in the reference PCR). In order to determine the design life of the Harmony formulas, the following durability test methodologies (which were stated in the reference PCR) were utilized:

- ASTM D2805-11 – Opacity
- ASTM D2486-06(2012)e1 – Scrub Resistance
- ASTM D6736-08(2013) – Burnish
- ASTM D4828-94(2012)e1 - Washability

Based on the durability test results, the appropriate quality levels and coating quantities were derived for each Sher-Wood® Polyester HS Finish formula. If testing results were unavailable for a formula, then it was assumed to be of 'low' quality. This is consistent with the reference PCR.

Table 2. Formula Lifetimes and Quantity of Coating Needed to Satisfy Functional Unit

Product Formula	F64CSA1	F64FSA1
Quality Level[2]	**Primer**	**Primer**
Market-Based Lifetime (years)	5	5
Corresponding Design Life (years)	N/A	N/A
Total Quantity Needed using Market-Based Life (kg)[3]	1.17	1.20
Total Quantity Needed using Design Life (kg)[4]	N/A	N/A
Tint Needed - Market (grams)	0	0
Tint Needed - Design (grams)	N/A	N/A

Tinting:

As stated in the reference PCR, the tint/colorant inventory was taken from thinkstep carbon black pigment data in the appropriate quantity specified by the type of coating base for the Sher-Wood® Polyester HS Finish formula.

[2] See reference PCR for background on quality levels for technical performance.
[3] Value includes 10% over-purchase stipulated by reference PCR.
[4] Value includes 10% over-purchase stipulated by reference PCR.

Allocation Rules:

In accordance with the reference PCR, allocation was avoided whenever possible, however if allocation could not be avoided, the following hierarchy of allocation methods was utilized:

- Mass, or other biophysical relationship; and
- Economic value.

In the LCA models, mass allocation was ONLY used during packaging and end of life-stages.

Treatment of Biogenic Carbon:

In accordance with the reference PCR, global warming values were calculated and presented both including and excluding biogenic carbon.

System Boundary:

This LCA included all relevant steps in the coating manufacturing process as described by the reference PCR. The system boundary began with the extraction of raw materials to be used in the Sher-Wood® Polyester HS Finish coating and its formula is manufactured in a way similar to other architectural paint and coating products. The raw materials are manually added in appropriate quantities into a high-speed disperser which are mixed. The product is then moved via compressed air or gravity and filled into containers and shipped to a distribution center and then to the point of sale. A customer travels to the store to purchase the product and transports the coating to the site where it is applied. The applied coating adheres to the substrate where it remains until the substrate is disposed. Any unused coating will be disposed by the customer as well. Because the functional unit mandates a 60 years product life, multiple repaints were necessary and were accounted for by the LCA models. The system boundary ends with the end-of-life stage. This can be seen in Figure 1, below.

As described in the reference PCR, the following items were excluded from the assessment and they were expected to not substantially affect the results.

- personnel impacts;
- research and development activities;
- business travel;
- any secondary packaging (pallets, for example);
- all point of sale infrastructure; and
- the coating applicator.

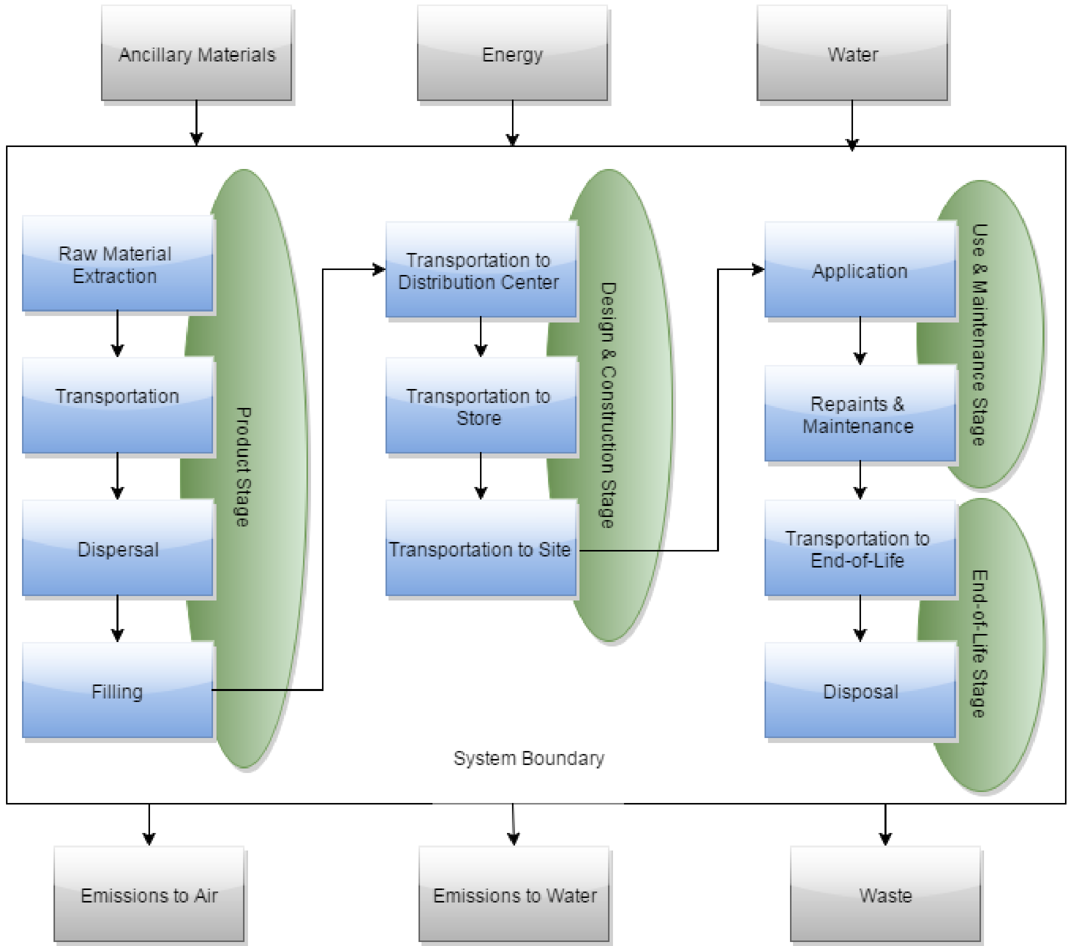


Figure 1. Diagram of System Boundary for the EPD.

Cut-Off Rules:

The cut-off rules prescribed by the reference PCR required a minimum of 95% of the total mass, energy, and environmental relevance be captured by the LCA models. The formula was modeled to over 99.8% of its material content by weight. No significant flows were excluded from the LCA models and the 5% threshold prescribed by the PCR was not exceeded.

Data Sources & Quality:

When primary data was unavailable, data was taken from either thinkstep, ecoinvent, or CEPE's coating industry life cycle inventory. The data from thinkstep and ecoinvent are widely accepted by the LCA community and the CEPE database has been built using those databases as a foundation. A brief description of these databases is below:

Table 3. Overview of Databases used in LCA Models.

Database	Comments
Sherwin-Williams	Primary source data taken as an average monthly value over a 12-month average of 2018 relevant facilities operation metrics.
thinkstep/GaBi	DB Version 8.6.20
ecoinvent	Version 3.3 – Most recent version available in GaBi.
CEPE LCI	Most recent version of industry LCI. Last revised August, 2016. Made up of refined data from thinkstep and ecoinvent so that it is more representative of coating manufacturing. Primarily limited to EU data, although some processes are global.

Precision and Completeness:

Annual averages from the 2018 calendar year of primary data was used for all gate-to-gate processes and the most representative inventories were selected for all processes outside of Sherwin-Williams' direct operational control. Secondary data was primarily drawn from the most recent GaBi and ecoinvent databases and CEPE's 2016 coating life cycle inventory. All of these databases were assessed in terms of overall completeness.

Assumptions relating to application and disposal were conformant with the reference PCR. All data used in the LCA models was less than five years old. Pigment and resin data were taken from both ecoinvent v3.3 and GaBi databases.

Consistency and Reproducibility:

In order to ensure consistency, primary source data was used for all gate-to-gate processes in coating manufacturing. All other secondary data were applied consistently and any modifications to the databases were documented in the LCA Report.

This assessment was completed using an EPD calculator tool that has been externally verified by NSF Certification LLC. This tool was not altered in any way from its original and verified form to generate the LCA results described in this EPD, and the results from the calculator were translated into the EPD by hand. Reproducibility is possible using the verified EPD Calculator tool or by reproducing the LCIs documented in the LCA Report.

Temporal Coverage:

Primary data was collected from the manufacturing facilities from the 2018 calendar year. Secondary data reflected the most up-do-date versions of the LCA databases mentioned above.

Geographic Coverage:

The Sher-Wood® Polyester HS Finish formula is manufactured by the Sherwin-Williams Company, or its authorized licensee, SWCA. This product can be made in either the United States or by licensees in Central America. To provide conservative environmental impact estimates, the average US grid mix was used in the LCA models, as it typically has larger environmental impacts than those of Central America, as well as more comprehensive inventories. The overall data quality score was altered to reflect this. Sher-Wood® Polyester HS Finish products are purchased, used, and the unused portions are disposed by the customer throughout the US and/or Central America as well.

Life Cycle Impact Assessment:

The purpose of the Life Cycle Impact Assessment (LCIA) is to show the link between the life cycle inventory results and potential environmental impacts. As such, these results are classified and characterized into several impact categories which are listed and described below. The TRACI 2.1 method was used and the LCIA results are conformant with the PCR, which was based on ISO 21930. The TRACI method is widely accepted and was developed by the US EPA.

Table 4. Overview of Impact Categories[5]

Overview of LCA Impact Categories	
Impact Category Name	**Description of Impact Category**
Global Warming Potential 	"Global warming is an average increase in the temperature of the atmosphere near the Earth's surface and in the troposphere, which can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human induced. In common usage, "global warming" often refers to the warming that can occur as a result of increased emissions of greenhouse gases from human activities" (US Environmental Protection Agency 2008b). Biogenic carbon was both included and excluded in the analysis as stipulated by the PCR.
Ozone Depletion Potential 	Ozone within the stratosphere provides protection from radiation, which can lead to increased frequency of skin cancers and cataracts in the human populations. Additionally, ozone has been documented to have effects on crops, other plants, marine life, and human-built materials. Substances which have been reported and linked to decreasing S-10637-OP-1-0 REVISION: 0 DATE: 6/22/2012 Page 13 | 24 Document ID: S-10637-OP-1-0 Date: 7/24/2012 the stratospheric ozone level are chlorofluorocarbons (CFCs) which are used as refrigerants, foam blowing agents, solvents, and halons which are used as fire extinguishing agents (US Environmental Protection Agency 2008j).
Acidification Potential 	Acidification is the increasing concentration of hydrogen ion (H+) within a local environment. This can be the result of the addition of acids (e.g., nitric acid and sulfuric acid) into the environment, or by the addition of other substances (e.g., ammonia) which increase the acidity of the environment due to various chemical reactions and/or biological activity, or by natural circumstances such as the change in soil concentrations because of the growth of local plant species n (US Environmental Protection Agency 2008q).
Smog Formation Potential 	Ground level ozone is created by various chemical reactions, which occur between nitrogen oxides (NOx) and volatile organic compounds (VOCs) in sunlight. Human health effects can result in a variety of respiratory issues including increasing symptoms of bronchitis, asthma, and emphysema. Permanent lung damage may result from prolonged exposure to ozone. Ecological impacts include damage to various ecosystems and crop damage. The primary sources of ozone precursors are motor vehicles, electric power utilities and industrial facilities (US Environmental Protection Agency 2008e).
Eutrophication Potential 	Eutrophication is the "enrichment of an aquatic ecosystem with nutrients (nitrates, phosphates) that accelerate biological productivity (growth of algae and weeds) and an undesirable accumulation of algal biomass" (US Environmental Protection Agency 2008d).

[5] See EPA TRACI References for Additional Detail

Life Cycle Impact Assessment Results:

The LCA results are documented and grouped separately below into the following stages as defined by ISO 21930.

- Total Impact (across the entire cradle-grave lifecycle including tinting)
- Product Stage (Stage 1)
- Construction & Design Stage (Stage 2)
- Use & Maintenance Stage (Stage 3)
- End-Of-Life Stage (Stage 4)

No weighting or normalization was done to the results. At this time, it is not recommended to weight the results of the LCA or the subsequent EPD. It is important to remember that LCA results show potential and expected impacts and these should not be used as firm thresholds/indicators of safety and/or risk. As with all scientific processes, there is uncertainty within the calculation and measurement of all impact categories and care should be taken when interpreting the results.

Results:

The results of the LCA are shown in the tables below. LCIA results for each life cycle stage as defined by ISO 21930 are shown graphically in Figure 2.

Table 5. LCA Results for Market Life Scenario.

	F64CSA1	F64FSA1
GWP Inc Bio Carb (kg CO2e)	8.20	9.64
GWP Exc Bio Carb (kg CO2e)	8.20	9.64
Acidification (kg SO2e)	1.25	1.95
Eutrophication (kg N e)	5.64E-03	1.02E-02
Ozone Depletion (kg CFC-11e)	5.70E-06	9.12E-07
Smog Formation (kg o3e)	1.67	1.78

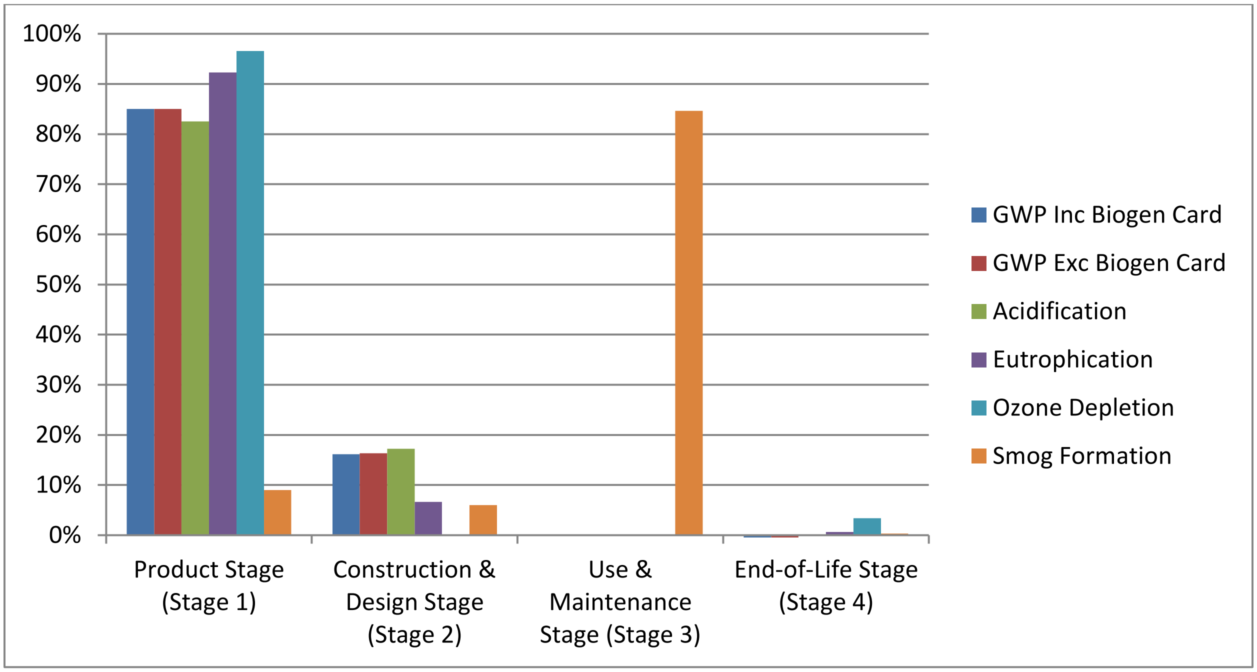


Figure 2. Impact Category Result Breakdown by ISO 21930 Stage.

Table 6. Energy, Resource, and Waste Results for Market Life Scenario.

(MARKET LIFE)	TOTAL	Stage 1	Stage 2	Stage 3	Stage 4
Non-Renew. Energy (MJ)	**271.44**	226.62	43.31	0.01	1.50
Use of Renewable Primary Energy (MJ)	**7.10**	5.93	1.13	0.00	0.04
Use of Non-Renew Mat. Resources (kg)	**7.90**	6.59	1.26	0.00	0.04
Use of Renewable Mat. Resources (kg)	**6.41E+03**	5352.83	1022.91	0.35	35.51
Consumption of Freshwater (m3)	**4.67**	3.90	0.74	0.00	0.03
Hydro Power (MJ)	**0**	0.00	0.00	0.00	0.00
Bio Energy (MJ)	**0**	0.00	0.00	0.00	0.00
Fossil Energy (MJ)	**263.02**	219.58	41.96	0.01	1.46
Nuclear Energy (MJ)	**8.42**	7.03	1.34	0.00	0.05
Other Energy (MJ)	**0**	0.00	0.00	0.00	0.00
Secondary Fuels (MJ)	0	0.00	0.00	0.00	0.00
Recycled Materials (kg)	0	0.00	0.00	0.00	0.00
Secondary Raw Materials (kg)	0	0.00	0.00	0.00	0.00
Non-Hazardous Waste	68.75%	N/A	N/A	N/A	N/A
Hazardous Waste	31.25%	N/A	N/A	N/A	N/A

Interpretation:

For Sher-Wood® Polyester HS Finish, the raw materials were responsible for the largest environmental impact across all impact categories, except smog formation potential. Specifically, the pigments and resins were the most impactful raw materials. Manufacturing, packaging, use, and disposal were only responsible for a small percent of overall impact. Transportation impacts were significant for several impact categories, but still much smaller than those of the raw materials. Because this product contains some VOC content, this led to a spike in smog formation during the use phase.

Generally speaking, the longer a coating lasts, the better its environmental performance will be. Ultimately, the end-user should decide which lifetime is more appropriate for their decision-making.

Study Completeness:

Completeness estimates are somewhat subjective as it is impossible for any LCA or inventory to be 100% complete. However, based on expert judgment, it is believed that given the overall data quality that the study is at least 95% complete. As such, at least 95% of system mass, energy, and environmental relevance were covered.

Uncertainty:

Because a large number of data sets are linked together in the LCA models, it is unknown how many of the data sets have goals that are dissimilar to this LCA. As such, it is difficult to estimate overall uncertainty of the LCA models. However, primary source data was used whenever possible and the most appropriate secondary data sources were used throughout the models. The thinkstep and ecoinvent databases are widely accepted by the LCA community and CEPE's LCI Database is based off thinkstep and ecoinvent data, just optimized/corrected for coating manufacturing processes.

Since the reference PCR stipulated the majority of the crucial LCA assumptions, Sherwin-Williams is comfortable with the methodology of the LCA and feel they reflect best-practices.

Limitations:

LCA is not a perfect tool for comparisons and impact values are constantly changing due to shifts in the grid mix, transportation, fuels, etc. Because of this, care should be taken when applying or interpreting these results. This being said, the relative impacts between products should be more reliable and less sensitive versus the specific impact category and metric values.

As stated in the LCA report, there were cases where analogue chemicals had to be used in the LCA models. This occurred when no LCI data was available for an intermediate chemical/material. This was typically limited to additives representing a very small amount of the overall formula (less than a percent), but still may impact the results. Likewise, there were cases where data had to be used from a different region or technology. These instances were uncommon and noted in the Data Quality section of the LCA Report and were not expected to have a serious effect on the results, but still may limit the study.

Finally, as mentioned in the geographic scope, US inventories were often used as ones for Central America were often unavailable or incomplete. This has been taken into account in the data quality store and is expected to cause the LCIA results to be conservative overestimates.

Emissions to Water, Soil, and to Indoor Air:

VOC determination was done using the federally-accepted methods outlined by the EPA in the Federal Register. Additional information can be found for the Sher-Wood® Polyester HS Finish formulas on the SWCA website at www.sherwinca.com.

Critical Review:

Since the goal of the LCA was to generate an EPD, it was submitted for review by NSF Certification LLC. NSF commissioned Mr. Jack Geibig of EcoForm to conduct the formal review of the LCA report.

Additional Environmental Information:

VOC Content	
<*500* g/L	**Determined by *EPA VOC Regulatory Calculation***

Preferred End-of Life Options for Sher-Wood® Polyester HS Finish:

Unused paint should be taken to an appropriate waste disposal center. See product label for details. Never place unused product down any indoor or outdoor drain.

SHERWIN-WILLIAMS.

References:

ASTM International, West Conshohocken, PA, 2014, www.astm.org.

American Coating Association Product Category Rule for Architectural Coatings. Available at http://standards.nsf.org/apps/group_public/download.php/28098/ACA%20PCR%20%2006-17-15%20-%20Final.pdf. Published June, 2015.

EPA VOC Calculation Rules. http://www3.epa.gov/ttn/atw/183e/aim/fr1191.pdf

ISO 14025:2006 *Environmental labels and declarations – Type III environmental declarations – Principles and procedures.*

ISO 14040:2006 *Environmental management - Life cycle assessment – Principles and framework.*

ISO 14044:2006 *Environmental management - Life cycle assessment – Requirements and guidelines.*

ISO 21930:2007 *Sustainability in building construction – Environmental declaration of building products.*

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Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI) TRACI version 2.1. The Environmental Protection Agency. August 2012.

Sherwin-Williams Central America Website. http://www.sherwinca.com.