

## Environmental Product Declaration – Natura® Interior Waterborne



Natura® Interior Waterborne paint is a premium quality, zero VOC\* and zero emissions after 4 hours\*\* paint that provides a durable, washable and fade-resistant finish. Natura® is ideally suited for residential applications.

Visit [www.benjaminmoore.com](http://www.benjaminmoore.com) for more information.



The product image to the right is an example of one of the formulas covered by the EPD. A list of all relevant formulas is shown in Table 2 in this EPD.



\*Zero VOC according to EPA Method 24.

\*\* Zero Emissions (measured at 4 hours after application) according to ASTM Standard Guide D 5116 and CDPH/EHLB/Standard Method V1.1.

Declaration Holder	Benjamin Moore & Co. (Email; <a href="mailto:info@benjaminmoore.com">info@benjaminmoore.com</a> ; website: <a href="http://benjaminmoore.com">benjaminmoore.com</a> for additional information)
Declaration Number	EPD10099
Declared Product	Natura® Interior Waterborne paint
Product Category and Subcategory	Architectural Coatings – Interior Architectural Coatings
Program Operator	NSF International ( <a href="mailto:ncss@nsf.org">ncss@nsf.org</a> )
PCR	PCR for Architectural Coatings – 7-18-2015
Date of Issue	August 31, 2017
Period of Validity	5 years from date of issue
Product Contents	See Table 2

The PCR review was conducted by	Thomas P. Gloria, PhD – Industrial Ecology Consultants ( <a href="mailto:t.gloria@industrial-ecology.com">t.gloria@industrial-ecology.com</a> )	
This EPD was independently verified by NSF International in accordance with ISO 21930 and ISO 14025. <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External	Jenny Oorbeck <a href="mailto:joorbeck@nsf.org">joorbeck@nsf.org</a>	
This life cycle assessment was independently verified in accordance with ISO 14044 and the PCR by <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External	Jack Geibig - EcoForm <a href="mailto:jgeibig@ecoform.com">jgeibig@ecoform.com</a>	

Functional Unit	1m <sup>2</sup> 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	15 years (see Table 4)
Test Methods Used to Calculate Design Life	MPI 114, MPI 141, MPI 153, MPI 154, and MPI 164
Estimated Amount of Colorant	Varies (see Table 4)
Data Quality Assessment Score	Very good
Manufacturing Location(s)	All Benjamin Moore manufacturing locations in the United States producing the products listed in this EPD.

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.

## Product Definition and Characteristics

Natura® Interior Waterborne paint has been specifically designed for new or previously painted interior wallboard, plaster and masonry, as well as primed or previously painted wood and metal. These products provide a beautiful finish on walls and ceilings.

## THE BENJAMIN MOORE® ADVANTAGES

Over 5,000 independent retailers and 200+ field and architectural representatives ready to help you. Benjamin Moore provides a full selection of premium and commercial products for every job as well as an architectural support program to help you specify the right products for any job. To find a Benjamin Moore representative in your area, visit [www.benjaminmoore.com](http://www.benjaminmoore.com) or call 866-708-9180.

## Product Classification and Description

The products listed below in Table 1 are included within this assessment. The primary differences between these products are gloss levels (sheen) and base types. For additional information on each of the specific products, please visit [www.benjaminmoore.com](http://www.benjaminmoore.com).

*Table 1: List of Natura® Interior Waterborne formulas assessed by LCA model and report*

EPD Product Name	Product Number	Sheen	PCR Base Type
Natura® Interior Waterborne- Primer Finish and Primer Base	51100	Primer	None
Natura® Interior Waterborne- Primer Finish and Primer Base	51104	Primer	None
Natura® Interior Waterborne- Flat Finish and White Base	51201	Flat	None
Natura® Interior Waterborne- Flat Finish and 1X Base	5121X	Flat	Light Base
Natura® Interior Waterborne- Flat Finish and 2X Base	5122X	Flat	Pastel Base
Natura® Interior Waterborne- Flat Finish and 3X Base	5123X	Flat	Deep Base
Natura® Interior Waterborne- Flat Finish and 4X Base	5124X	Flat	Accent Base
Natura® Interior Waterborne- Eggshell Finish and White Base	51301	Eggshell	None
Natura® Interior Waterborne- Eggshell Finish and 1X Base	5131X	Eggshell	Light Base
Natura® Interior Waterborne- Eggshell Finish and 2X Base	5132X	Eggshell	Pastel Base
Natura® Interior Waterborne- Eggshell Finish and 3X Base	5133X	Eggshell	Deep Base
Natura® Interior Waterborne- Eggshell Finish and 4X Base	5134X	Eggshell	Accent Base
Natura® Interior Waterborne- Semi-gloss Finish and White Base	51401	Semi-gloss	None
Natura® Interior Waterborne- Semi-gloss Finish and 1X Base	5141X	Semi-gloss	Light Base
Natura® Interior Waterborne- Semi-gloss Finish and 2X Base	5142X	Semi-gloss	Pastel Base
Natura® Interior Waterborne- Semi-gloss Finish and 3X Base	5143X	Semi-gloss	Deep Base
Natura® Interior Waterborne- Semi-gloss Finish and 4X Base	5144X	Semi-gloss	Accent Base

Natura® Interior Waterborne- Pearl Finish and 1X Base	K5161X	Pearl	Light Base
Natura® Interior Waterborne- Pearl Finish and 2X Base	K5162X	Pearl	Pastel Base
Natura® Interior Waterborne- Pearl Finish and 3X Base	K5163X	Pearl	Deep Base
Natura® Interior Waterborne- Pearl Finish and 4X Base	K5164X	Pearl	Accent Base

Under the Product Category Rule (PCR) for Architectural Coatings, all of the Natura® Interior Waterborne products fall under the General exterior and interior coatings category. All Natura® Interior Waterborne products described in this EPD are considered to be Interior Architectural Coatings.

In the paint manufacturing process, pigments, resin, water, and additives are mixed together to form a paste. This pigment-based paste is then processed to disperse the pigment into additional solvent. Finally, this paste is thinned with the proper amount of solvent to form the final product. In addition to the materials associated with paint production, other inputs to the production process include electrical energy, process water, and metal, plastic, and paper packaging materials. The outputs of this manufacturing stage include packaged paint products, waste for disposal, waste water for treatment, and manufacturing emissions.

#### Material composition

The typical composition of a Natura® Interior Waterborne coating is shown by % mass in Table 2.

*Table 2: Typical composition of Natura® Interior Waterborne by % mass*

Ingredient category	% of product by mass
<b>Additive</b>	0 – 3.5%
<b>Antifoamer</b>	0.14 – 0.73%
<b>Biocide</b>	0.28 – 0.59%
<b>Nepheline</b>	0.67 – 45%
<b>Resin</b>	20 – 58%
<b>Silica</b>	0 – 4.8%
<b>Surfactant</b>	1.1 – 1.7%
<b>Thickener</b>	1.4– 5.0%
<b>Titanium dioxide</b>	0 – 27%
<b>Water</b>	16 – 34%

## Life Cycle Assessment Methodology

### Functional Unit

Per PCR requirements, this EPD is based on a cradle-to-grave LCA, and the functional unit for the study is defined as 1 m<sup>2</sup> of covered and protected substrate for a period of 60 years. The PCR requires results to be calculated for a market-based lifetime and a design lifetime for the coating product.

#### *Market-Based Life Used In Assessment*

The market-based lifetime for interior coatings is 5 years.

#### *Design-Based Life Used in Assessment*

The design-based lifetime is determined by durability testing, as shown in Table 3. Paint is either low quality (3 year lifetime), medium quality (7 year lifetime) or high quality (15 year lifetime) based on these test results. The requirements for the durability testing were met through the testing for high performance MPI standards. The MPI scrubability and burnish resistance tests are based on the ASTM D2486 and ASTM D6736 standards, respectively, and follow methods of this standard that are more stringent than the ones specified by the PCR. The cleansability test is based on a more rigorous ASTM standard than the test specified by the PCR. If a test is not included in the MPI standard, it is because the test was not deemed relevant for that paint type, and does not need to be considered. Therefore, high performance MPI certifications can be considered high quality.

Each Natura® Interior Waterborne product was subjected to these tests, or the relevant MPI testing. The corresponding quality levels and coating quantities were calculated for each product and can be found in Table 4. **Error! Reference source not found..**

*Table 3: Required testing for design lifetime of interior coatings*

Test Type	Test	Substrate	Low Quality	Mid Quality	High Quality	MPI Test
Scrub Resistance	ASTM D2486-06 (2012)e1	Plastic	< 100 scrubs	100 – 400 scrubs	> 400 scrubs	>4000 scrubs
Burnish – 20 cycle	ASTM D6736-08 (2013)	Plastic	Change in gloss > 20	Change in gloss between 10 – 20	Change in gloss < 10	Change in gloss <2
Washability	ASTM D4828-94 (2012)e1	Plastic	Avg. score < 3	Avg. score between 3 – 7	Avg. score > 7	

*Table 4: Lifetime, reference flow, and quantity of colorant required*

Product Number	Quality level	Design lifetime (years)	Market lifetime (years)	Design lifetime quantity (kg)	Market lifetime quantity (kg)	Colorant - Design lifetime (g)	Colorant - Market lifetime (g)
51100	High	15	5	0.422	1.27	-	-
51104	High	15	5	0.539	1.62	-	-
51201	High	15	5	0.320	0.959	-	-
5121X	High	15	5	0.306	0.919	13.3	39.8
5122X	High	15	5	0.271	0.812	19.2	57.6
5123X	High	15	5	0.252	0.757	31.0	93.1
5124X	High	15	5	0.481	1.44	72.3	217
51301	High	15	5	0.308	0.925	-	-
5131X	High	15	5	0.295	0.885	13.3	39.8
5132X	High	15	5	0.252	0.756	19.1	57.3
5133X	High	15	5	0.229	0.686	30.7	92.2
5134X	High	15	5	0.431	1.29	71.3	214
51401	High	15	5	0.287	0.862	-	-
5141X	High	15	5	0.274	0.822	13.2	39.7
5142X	High	15	5	0.248	0.744	19.1	57.3
5143X	High	15	5	0.221	0.664	30.6	91.9
5144X	High	15	5	0.407	1.22	70.8	212
K5161X	High	15	5	0.285	0.854	13.2	39.7
K5162X	High	15	5	0.252	0.757	19.1	57.4
K5163X	High	15	5	0.225	0.676	30.7	92.1
K5164X	High	15	5	0.430	1.29	71.3	214

#### *Amount of Colorant Needed*

Following the PCR, for any coating that can accept colorant, it was assumed that the full allowable amount of colorant is added to the paint either at the point of sale or application site. The tint/colorant inventory was taken from the GaBi carbon black pigment data in the appropriate quantity specified for the type of coating base for the respective Natura® Interior Waterborne product. The amount of colorant needed for each formula is shown in Table 4 and its impact is included in the overall LCA results.

#### Data Quality Assessment

##### *Precision and Completeness*

The majority of the relevant foreground data are measured or calculated based on primary data from the owner of the technology, so precision is considered high. Completeness of each foreground process is considered high as each process was checked for mass balance and completeness of the emission inventory. All background data are sourced from the GaBi 2016 databases with the documented precision and completeness.

##### *Consistency and Reproducibility*

To ensure data consistency, all primary data were collected with the same level of detail, while all background data were sourced from the GaBi 2016 databases. Reproducibility is supported as much as

possible through the disclosure of input-output data, dataset choices, and modeling approaches.

#### *Temporal Coverage*

All primary data were collected for the fiscal year 2015. All secondary data come from the GaBi 2016 databases and are representative of the years 2010-2015. As the study intended to compare the product systems for the reference year 2015, temporal representativeness is considered to be high.

#### *Geographic Coverage*

All primary and secondary data were collected specific to the countries or regions under study. Where country-specific or region-specific data were unavailable, proxy data were used. Geographical representativeness is considered to be high.

#### Allocation

As stated in the reference PCR, allocation was avoided whenever possible. The only allocation used in the LCA model was mass-based allocation during the manufacturing process, to assign Benjamin Moore manufacturing plant inputs and outputs across multiple products produced at the same plant.

#### System Boundary

As shown in Figure 1, the system boundary includes all life cycle stages as defined by ISO 21930, from raw material extraction and processing, coating manufacture, application and end-of-life treatment, with transportation included in all stages.

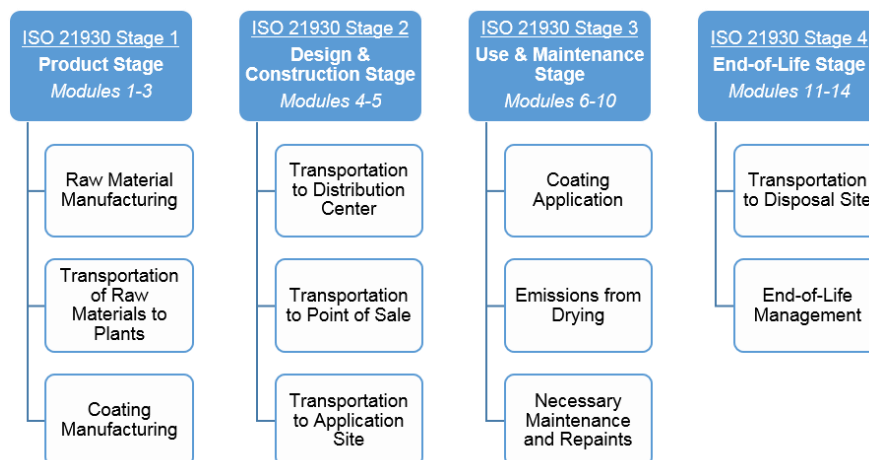


Figure 1: Life cycle stages included in system boundary

#### *Cut-Off Criteria*

No cut-off criteria were defined for this study. All relevant inputs were included in LCA models with the exception of:

- Personnel impacts;
- Research and development activities;
- Business travel;
- Any secondary or tertiary packaging (e.g., pallets);
- All point of sale infrastructure; and,
- The coating applicator.

#### Life Cycle Impact Assessment

##### Impact Assessment Categories

The Life Cycle Impact Assessment (LCIA) relates the life cycle inventory to the potential environmental

impacts. The PCR requires that the following key parameters of environmental impact assessment be declared based on the EPA's TRACI methodology (v2.1), except in the case of global warming potential which must be declared based on the IPPC (AR5) methodology:

- Global warming potential (GWP) – 100 year (used in place of climate change)
- Acidification potential (AP)
- Ozone depletion potential (ODP)
- Smog formation potential (SFP) (used in place of photochemical ozone creation potential)
- Eutrophication (EP)

The PCR also requires that the following material and energy emissions and waste shall be calculated and declared:

- Depletion of non-renewable energy resources
- Depletion of non-renewable material resources
- Use of renewable primary energy
- Use of renewable material resources
- Consumption of freshwater
- Hazardous waste disposed
- Non-hazardous waste disposed
- Secondary fuels
- Non-renewable resources
- Renewable resources
- Recycled materials
- Secondary raw materials
- Water

#### Key Environmental Parameters

The LCIA results for the design lifetime and the market lifetime are shown in Table 5 and Table 6, respectively. A representative product was chosen based on the median of the five impact categories. Results for global warming potential for the entire product line and the representative product are shown in Figure 2. Results for this product grouped by life cycle stages prescribed by the PCR are presented in Figure 3. Results in **Error! Reference source not found.** are shown for market life, but the percent contribution for each stage for design life are essentially identical.

*Table 5: LCIA results for design lifetime*

Impact category	Global warming potential 100, excl biogenic carbon [kg CO <sub>2</sub> -equiv.]	Acidification [kg SO <sub>2</sub> -equiv.]	Eutrophication [kg N-equiv.]	Ozone depletion air [kg CFC 11-equiv.]	Smog air [kg O <sub>3</sub> -equiv.]
51100	1.39E+00	2.90E-02	3.09E-04	2.42E-09	6.82E-02
51104	1.32E+00	1.20E-02	2.73E-04	3.16E-09	6.17E-02
51201	1.16E+00	2.84E-02	2.63E-04	1.64E-09	5.78E-02
5121X	1.15E+00	2.73E-02	2.56E-04	1.57E-09	5.64E-02
5122X	9.10E-01	1.46E-02	1.89E-04	1.50E-09	4.23E-02
5123X	7.43E-01	5.99E-03	1.42E-04	1.41E-09	3.26E-02
5124X	1.39E+00	4.12E-03	2.51E-04	2.75E-09	5.80E-02
51301	1.20E+00	2.95E-02	2.70E-04	1.64E-09	5.91E-02
5131X	1.18E+00	2.83E-02	2.63E-04	1.57E-09	5.76E-02
5132X	9.35E-01	1.44E-02	1.92E-04	1.50E-09	4.25E-02
5133X	8.26E-01	6.30E-03	1.54E-04	1.41E-09	3.48E-02
5134X	1.55E+00	4.49E-03	2.73E-04	2.72E-09	6.20E-02
51401	1.18E+00	2.88E-02	2.57E-04	1.57E-09	5.63E-02
5141X	1.17E+00	2.76E-02	1.99E-04	1.50E-09	4.41E-02
5142X	9.73E-01	1.53E-02	1.57E-04	1.40E-09	3.54E-02
5143X	8.46E-01	6.45E-03	2.69E-04	2.71E-09	6.13E-02
5144X	1.55E+00	4.42E-03	2.62E-04	1.57E-09	5.75E-02
K5161X	1.18E+00	2.89E-02	1.93E-04	1.50E-09	4.30E-02
K5162X	9.40E-01	1.47E-02	1.49E-04	1.40E-09	3.38E-02
K5163X	7.93E-01	6.27E-03	2.55E-04	2.72E-09	5.88E-02
K5164X	1.44E+00	4.14E-03	2.55E-04	2.72E-09	5.88E-02



*Table 6: LCIA results for market lifetime*

Impact category	Global warming potential 100, excl biogenic carbon [kg CO <sub>2</sub> -equiv.]	Acidification [kg SO <sub>2</sub> -equiv.]	Eutrophication [kg N-equiv.]	Ozone depletion air [kg CFC 11-equiv.]	Smog air [kg O <sub>3</sub> -equiv.]
51100	4.18E+00	8.69E-02	9.28E-04	7.26E-09	2.05E-01
51104	3.96E+00	3.60E-02	8.20E-04	9.47E-09	1.85E-01
51201	3.47E+00	8.51E-02	7.88E-04	4.91E-09	1.73E-01
5121X	3.44E+00	8.18E-02	7.67E-04	4.71E-09	1.69E-01
5122X	2.73E+00	4.38E-02	5.68E-04	4.51E-09	1.27E-01
5123X	2.23E+00	1.80E-02	4.27E-04	4.24E-09	9.77E-02
5124X	4.18E+00	1.24E-02	7.52E-04	8.25E-09	1.74E-01
51301	3.59E+00	8.84E-02	8.11E-04	4.92E-09	1.77E-01
5131X	3.55E+00	8.48E-02	7.88E-04	4.72E-09	1.73E-01
5132X	2.81E+00	4.32E-02	5.75E-04	4.49E-09	1.27E-01
5133X	2.48E+00	1.89E-02	4.63E-04	4.22E-09	1.04E-01
5134X	4.66E+00	1.35E-02	8.20E-04	8.17E-09	1.86E-01
51401	3.55E+00	8.65E-02	7.71E-04	4.70E-09	1.69E-01
5141X	3.50E+00	8.28E-02	5.96E-04	4.50E-09	1.32E-01
5142X	2.92E+00	4.58E-02	4.71E-04	4.21E-09	1.06E-01
5143X	2.54E+00	1.93E-02	8.06E-04	8.12E-09	1.84E-01
5144X	4.64E+00	1.33E-02	7.85E-04	4.71E-09	1.72E-01
K5161X	3.53E+00	8.66E-02	5.78E-04	4.49E-09	1.29E-01
K5162X	2.82E+00	4.41E-02	4.47E-04	4.21E-09	1.01E-01
K5163X	2.38E+00	1.88E-02	7.66E-04	8.15E-09	1.76E-01
K5164X	4.33E+00	1.24E-02	7.66E-04	8.15E-09	1.76E-01

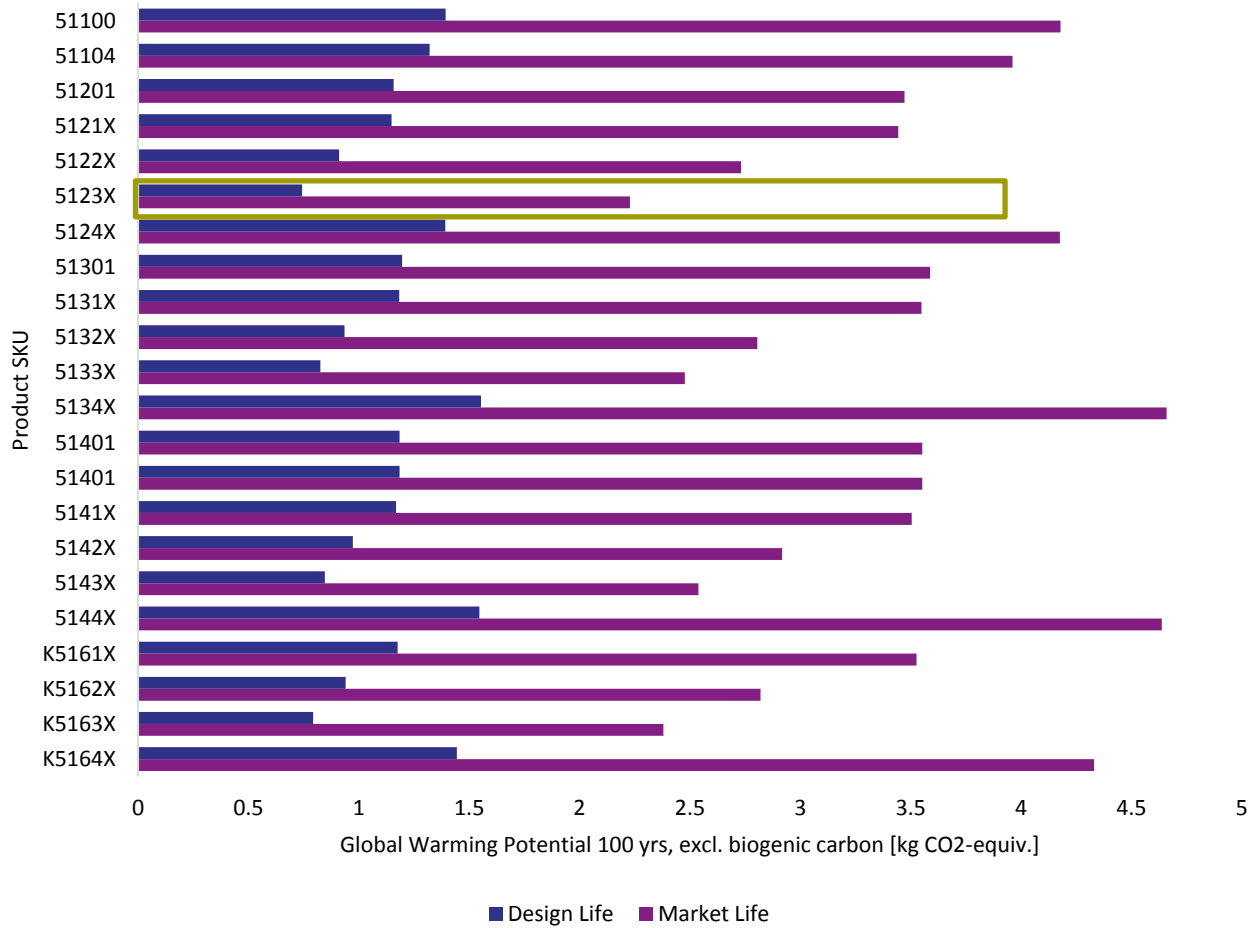


Figure 2: Global Warming Potential 100 yrs., excl. biogenic carbon for product line, design and market life

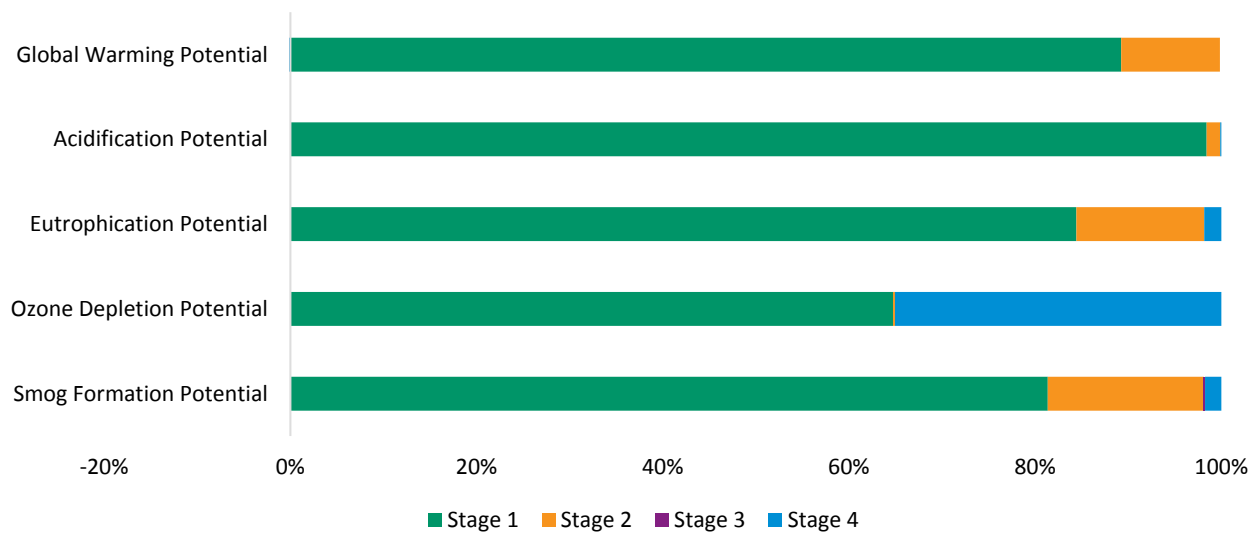


Figure 3: LCIA results by product stage for representative product, 5121X (market life)

Material and Energy resources, Emissions and Wastes:

*Additional Life Cycle Inventory Results*

The additional inventory results required by the PCR for the representative product are shown in Table 7 and

Table 8.

Table 7: Additional LCI categories for the design life of 5121X

Additional LCI category	Total	Stage 1	Stage 2	Stage 3	Stage 4
<b>Primary energy, non-renewable [MJ]</b>	<b>1.93E+01</b>	<b>1.71E+01</b>	<b>2.11E+00</b>	<b>0.00E+00</b>	<b>1.15E-01</b>
Crude oil [MJ]	5.92E+00	3.86E+00	1.93E+00	0.00E+00	1.18E-01
Hard coal [MJ]	3.90E+00	4.03E+00	5.54E-02	0.00E+00	-9.91E-02
Natural gas [MJ]	9.14E-01	8.96E-01	6.18E-03	0.00E+00	1.23E-02
Lignite [MJ]	7.40E+00	7.25E+00	8.64E-02	0.00E+00	6.02E-02
Uranium [MJ]	1.15E+00	1.10E+00	2.83E-02	0.00E+00	2.41E-02
<b>Primary energy, renewable [MJ]</b>	<b>1.07E+00</b>	<b>9.84E-01</b>	<b>6.60E-02</b>	<b>0.00E+00</b>	<b>2.32E-02</b>
Geothermal [MJ]	2.78E-02	2.68E-02	9.51E-04	0.00E+00	8.49E-05
Hydro [MJ]	2.78E-02	2.68E-02	9.51E-04	0.00E+00	8.49E-05
Solar [MJ]	2.46E-01	2.30E-01	6.47E-03	0.00E+00	9.75E-03
Wind [MJ]	5.27E-01	4.63E-01	5.37E-02	0.00E+00	1.02E-02
<b>Depletion of non-renewable material resources [kg]</b>	<b>2.59E+00</b>	<b>2.55E+00</b>	<b>1.90E-02</b>	<b>0.00E+00</b>	<b>3.48E-02</b>
<b>Use of renewable resources [kg]</b>	<b>8.66E+00</b>	<b>8.66E+00</b>	<b>8.33E+00</b>	<b>2.73E-01</b>	<b>0.00E+00</b>
Air [kg]	8.60E+00	8.30E+00	2.61E-01	0.00E+00	4.65E-02
Carbon dioxide [kg]	3.52E-02	3.13E-02	3.08E-03	0.00E+00	8.11E-04
Nitrogen [kg]	0.00E+00	0.00E+00	3.92E-14	0.00E+00	-4.70E-09
Oxygen [kg]	1.60E-02	4.86E-03	8.11E-03	0.00E+00	3.07E-03
Primary forest [kg]	1.04E-07	9.98E-08	1.50E-14	0.00E+00	3.93E-09
Renewable fuels [kg]	4.68E-08	5.42E-07	0.00E+00	0.00E+00	0.00E+00
Recycled materials (kg)	1.05E-02	0.00E+00	0.00E+00	0.00E+00	1.05E-02
Secondary raw materials (kg)	4.80E-04	4.80E-04	0.00E+00	0.00E+00	0.00E+00
Hazardous waste [%]	0.0505%	0.0505%	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste [%]	0.246%	0.246%	0.00E+00	0.00E+00	0.00E+00
Blue water consumption [m <sup>3</sup> ]	5.46E-03	4.95E-03	5.13E-04	0.00E+00	-5.16E-06

Table 8: Additional LCI categories for the market life of 5121X

Additional LCI category	Total	Stage 1	Stage 2	Stage 3	Stage 4
<b>Primary energy, non-renewable [MJ]</b>	<b>5.78E+01</b>	<b>5.14E+01</b>	<b>6.32E+00</b>	<b>0.00E+00</b>	<b>3.46E-01</b>
Crude oil [MJ]	1.77E+01	1.16E+01	5.79E+00	0.00E+00	3.53E-01
Hard coal [MJ]	1.17E+01	1.21E+01	1.66E-01	0.00E+00	-2.97E-01
Natural gas [MJ]	2.74E+00	2.69E+00	1.85E-02	0.00E+00	3.70E-02
Lignite [MJ]	2.22E+01	2.18E+01	2.59E-01	0.00E+00	1.81E-01
Uranium [MJ]	3.45E+00	3.30E+00	8.48E-02	0.00E+00	7.24E-02
<b>Primary energy, renewable [MJ]</b>	<b>3.22E+00</b>	<b>2.95E+00</b>	<b>1.98E-01</b>	<b>0.00E+00</b>	<b>6.97E-02</b>
Geothermal [MJ]	8.35E-02	8.04E-02	2.85E-03	0.00E+00	2.55E-04
Hydro [MJ]	8.35E-02	8.04E-02	2.85E-03	0.00E+00	2.55E-04
Solar [MJ]	7.38E-01	6.89E-01	1.94E-02	0.00E+00	2.92E-02
Wind [MJ]	1.58E+00	1.39E+00	1.61E-01	0.00E+00	3.07E-02
<b>Depletion of non-renewable material resources [kg]</b>	<b>7.78E+00</b>	<b>7.66E+00</b>	<b>5.69E-02</b>	<b>0.00E+00</b>	<b>1.04E-01</b>
<b>Use of renewable resources [kg]</b>	<b>2.60E+01</b>	<b>2.50E+01</b>	<b>8.18E-01</b>	<b>0.00E+00</b>	<b>1.51E-01</b>
Air [kg]	2.58E+01	2.49E+01	7.84E-01	0.00E+00	1.39E-01
Carbon dioxide [kg]	1.06E-01	9.38E-02	9.24E-03	0.00E+00	2.43E-03
Nitrogen [kg]	0.00E+00	0.00E+00	1.17E-13	0.00E+00	-1.41E-08
Oxygen [kg]	4.81E-02	1.46E-02	2.43E-02	0.00E+00	9.20E-03
Primary forest [kg]	3.11E-07	2.99E-07	4.50E-14	0.00E+00	1.18E-08
Renewable fuels [kg]	1.41E-07	1.63E-06	0.00E+00	0.00E+00	0.00E+00
Recycled materials (kg)	3.14E-02	0.00E+00	0.00E+00	0.00E+00	3.14E-02
Secondary raw materials (kg)	1.44E-03	1.44E-03	0.00E+00	0.00E+00	0.00E+00
Hazardous waste [kg]	0.0505%	0.0505%	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste [kg]	0.246%	0.246%	0.00E+00	0.00E+00	0.00E+00
Blue water consumption [m <sup>3</sup> ]	1.64E-02	1.48E-02	1.54E-03	0.00E+00	-1.55E-05

### *Emissions to Water, Soil, and to Indoor Air*

Because coatings are a passive product during use, the only impacts occurring during this phase are generally due to the off-gassing of material components in the paint. The quantity of VOC emissions during the use phase for Natura® Interior Waterborne paints products are assumed to equal the EPA Method 24 listed VOC contents on the label.

### LCA Interpretation

For all Natura® Interior Waterborne paints, raw materials and manufacturing are the highest contributors to all impact categories. The raw materials burden is dominated by the pigments and acrylic resin, which follows as they are often the highest percent by weight in the paint composition and the energy demand for producing titanium dioxide (a pigment) is relatively high. Acidification potential in particular is dominated by the titanium dioxide production. Manufacturing, packaging, and use are low for all impact categories. The relatively high ozone depletion potential in the end of life are due to the energy required to recycle packaging materials at end of life. Transportation is small but significant for global warming potential, eutrophication, and smog formation potentials.

### Additional Environmental Information

#### Environmental Certifications



Natura® Interior Waterborne paints meet stringent VOC standards, and are Master Painters Institute approved. Natura® is certified asthma & allergy friendly®, Cradle to Cradle Certified™ Silver, Collaborative for High Performance Schools (CHPS) and California Department of Health Environmental Health Laboratory (CDPH/EHLB) standard method V1.1 emission certified. Natura® carries Benjamin Moore's Green Promise® designation.



Benjamin Moore's Green Promise designation is our company's assurance that this product meets – and often exceeds– rigorous environmental and performance criteria regarding VOCs, emissions, application, washability, scrubbability and packaging, while also delivering the premium levels of performance you expect from Benjamin Moore.

This product meets Green Seal™ Standard GS-11 based on effective performance, minimized/recycled packaging, and protective limits on VOCs and human toxicity. GreenSeal.org

LEED® v4 Low Emitting Product Credit - Building Product Disclosure Credit.

### Preferred End-of Life Options

Please visit [www.paintcare.org](http://www.paintcare.org) for information about disposing unused acrylic enamel paint. If possible, unused paint should be taken to an appropriate recycling/take-back center or disposed of in accordance with local environmental regulatory agency guidance.

## References

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