PINTURAS THERMICAS DEL NORTE SA DE CV

THERMOTEK® DOBLE ACCIÓN FIBRATADO Tipo 5A

PRODUCT CARBON FOOTPRINT

Date of issue: January 2020
English

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This PCF report is not intended not be used to communicate superiority over other products and shall not be used to compare environmental performance with other similar products as functional unit, scope, system boundaries, methodology, LCI and data may differ.

INTRODUCTION

This disclosure report was prepared in order to communicate the PCF of THERMOTEK® DOBLE ACCIÓN FIBRATADO Tipo 5A manufactured by Pinturas Thermicas del Norte SA de CV in the facilities of Mexico located in Abasolo, Silao, Hermosillo and Mérida. PCF was calculated based on a cradle to gate scope.

This disclosure report is aligned to the guidelines stablished in the standard *NMX-SAA-14067-IMNC-2018 Gases de efecto invernadero-Huella de carbono de productos-Requisitos y directrices para cuantificación y comunicación.* PCF results are intended to be available to the public.

All information presented in this report was collected directly from BASF and based on the PCF results provided by BASF.

GENERAL INFORMATION

THERMOTEK® DOBLE ACCIÓN FIBRATADO Tipo 5A

THERMOTEK® DOBLE ACCIÓN FIBRATADO Tipo 5A is formulated with water-based acrylic stretch resins, additives against UV rays, silicone and a high content of fibers (these will give a lumpy consistency to the product by the high amount of fiber contained in its formulation) which form an excellent protective layer preventing the filtration of water and moisture. It also contains ceramic loads that reduce heat transfer by radiation and conduction inside buildings. It does not require reinforcement fabric on the entire surface, only at critical points.

Manufacturer:	Pinturas Thermicas del Norte SA de CV
Product:	THERMOTEK® DOBLE ACCIÓN FIBRATADO Tipo 5A
Product category and subcategory:	Architectural Coatings – Exterior Coatings
Manufacturing Location(s):	Abasolo, N.L., México Silao, Gto., México Hermosillo, Son., México Mérida, Yuc., México

PCF model developed by:	BASF David Green david.r.green@basf.com
Disclosure report prepared by:	Consultoría SPECS Magdalena Magaña Páramo mmagana@specs-consultoria.com
Disclosure report approved by:	BASF Jorge Esqueda Querol jorge.esqueda@basf.com
Date of issue:	January 10th 2020
Period of validity:	5 years

Functional unit:	1 kg of THERMOTEK® DOBLE ACCIÓN FIBRATADO Tipo 5A
PCR (if any):	No
PCF Type:	Parcial PCF

PRODUCT DEFINITION AND CHARACTERISTICS

1. KEY BENEFITS

- Excellent thermal protection due to high reflectance and low thermal conductivity (in white).
- White finish reflects more than 80% of sunlight.
- Excellent resistance to weathering (sudden changes in temperature, thermal shock, rain, saline environments, etc.)
- Does not form a vapor barrier, allowing the substrate or structure to lose moisture and dry.
- Based on its elasticity, can withstand the structural movements of normal contraction and expansion of all construction.
- Adheres with great firmness to the main building materials such as concrete, fibrocement, mortar, etc.
- Can be applied on old or damaged asphalt waterproofing for one year or less, after surface preparation.
- Is environmentally beneficial as it does not contain organic solvents or toxic or harmful pollutants.
- Has excellent covering power.
- Can be quickly applied with an excellent finish.

For more information visit https://grupothermotek.com/

2. MAIN USE

- Waterproof, decorative and protective coating on concrete roofs, fibrocement, metal sheets, among others. Ideal for residential, commercial and industrial use in manufacturing plants or warehouses.
- For maintenance and renovation of existing waterproofing systems.
- Thermal insulator due to high reflectance properties.

3. TECHNICAL DATA

Physical properties	Standard	Value
Viscosity [cps]	ASTM D 2196	40 000 min
pH	ASTM E-70	9,0 ± 0,5
Solids by weight,[%]	ASTM D-1644	49 ± 2,0
Initial tension [lb/pulg2]	ASTM D 2370	200
Density [gr/ml]	ASTM D-1475	1,29 ± 0,02
Elongation [%]	ASTM D 2370	150
Thermal emissivity	ASTM C 1371	0.9
Solar Reflectance [%]	ASTM C 1549	80

4. PRODUCT CONTENT

Raw material	CAS Number	Unit
Water	7732-18-5	48.81%
Limestone	1317-65-3	31.38%
2-Propenoic acid, butyl ester, polymer with ethenylbenzene	25767-47-9	13.67%
Titanium dioxide	13463-67-7	1.88%

Hazardous substances intentionally added to the product as defined by national or international regulations:

Ingredient name	CAS Number
Quartz (SiO2) particle size > 63 µm	14808-60-7
Dioctyl phthalate	117-84-0
Diuron (ISO); 3-(3,4-dichlorophenyl)-1,1-dimethylurea	330-54-1

Substances within Master Builders Solutions products are all screened to the Globally Harmonized System (GHS) prior to commercialization to comply with regional regulatory requirements. Any substances identified shall be noted on the manufacturer SDS.

5. MANUFACTURE

Raw materials extracted from nature are processed to form intermediate materials, such as titanium dioxide, using energy and other resources. These intermediate materials are then transported to the production facility to form the final product THERMOTEK® DOBLE ACCIÓN FIBRATADO Tipo 5A. Waste generated during the raw material processing is transported to waste disposal facilities.

In the manufacturing plant, intermediate materials are mixed with water in a high-speed disperser and then placed into plastic containers that are sealed and packaged for shipping.

6. PRODUCT INSTALLATION

The product is applied with roller or brush.

7. PRODUCT PERFORMANCE

1.2 L/m^2, 2 coatings applied
1.2 L/m^2, 2 coatings applied with reinforced mesh
Performance may vary depending on surface nature and surface roughness

GOAL AND SCOPE

1. GOAL

The goal of this study is to identify the potential carbon footprint for the product THERMOTEK® DOBLE ACCIÓN FIBRATADO Tipo 5A at the product stage (cradle to gate) to enable product improvement and make life-cycle information available to the public.

2. TARGET AUDIENCE

This study is addressed to consumers and other parties with interest in the environmental impact of the product THERMOTEK® DOBLE ACCIÓN FIBRATADO Tipo 5A.

3. REASONS FOR THE STUDY

Determine the carbon footprint of the product THERMOTEK® DOBLE ACCIÓN FIBRATADO Tipo 5A for decision making and to provide the public with information on the product's environmental impacts.

4. INTENDED USE

The results of the PCF are intended to be communicated through product labeling.

5. TIME-RELATED SCOPE

The study is modeled using production primary data from the year 2018. Secondary datasets were selected to be as close as possible to the 2018 reference year.

6. GEOGRAPHICAL SCOPE

This study refers to the production of THERMOTEK® DOBLE ACCIÓN FIBRATADO Tipo 5A in Mexico.

7. TECHNOLOGICAL SCOPE

The study refers to the production technology used at the Abasolo, Silao, Hermosillo and Merida plants in Mexico.

METHODOLOGY

PCF was calculated based on the following standards:

- ISO standards ISO 14040:2006 14040:2006 Environmental management — Life cycle assessment — Principles and framework
- ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines.
- ISO/TS 14067:2013 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification and communication.
- Greenhouse Gas Protocol - The Product Life Cycle Accounting and Reporting Standard (WRI & WBCSD, 2011).

1. FUNCTIONAL UNIT

1 kg of THERMOTEK® DOBLE ACCIÓN FIBRATADO Tipo 5A

2. REFERENCE FLOW

1 kg of THERMOTEK® DOBLE ACCIÓN FIBRATADO Tipo 5A

3. SYSTEM BOUNDARIES

This analysis was a preliminary review based on the manufacturing process, covering the Product Stage (cradle to gate). This study includes the raw material manufacturing, transportation of raw materials to plants and coating manufacturing. Modules or stages not included in this study are indicated in the table below as “MND” (Module not declared). Design and construction stage, use and maintenance, and end-of-life stages were excluded from the system boundaries.

Product stage (Modules 1-3)			**Design and construction stage (Modules 4-5)**			**Use and maintenance stage (Modules 6-10)**			**End of life stage (Modules 11-14)**	
Raw material manufacturing	Transportation of raw materials to plants	Coating manufacturing	Transportation to distribution center	Transportation to point of sale	Transportation to application site	Coating application	Emissions from drying	Necessary maintenance and repair	Transportation to disposal site	End-of-life management
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND

Product Stage

Raw material manufacturing: The impacts of raw material manufacturing and associated pre-chains were accounted for in the analysis. Waste and scrap created during raw material manufacturing and emissions associated with transporting these to point of disposal were not considered in calculations as this study was focused on the analysis of the manufacturing of the final product itself.

Transportation of raw materials to plants: Transportation was included for raw materials that were designated with transportation in the dataset (limestone). Transportation of other raw materials to the production facility were not considered, as data were not available and this study was focused on the analysis of the manufacturing of the final product itself.

Coating manufacture: This study includes coating manufacture and waste/scrap created during production of the final product. Colorant impact (titanium dioxide pigment) was also accounted for in the analysis. Packaging of the final product and transportation of waste created during production to the point of disposal point was not considered as this study was focused on the analysis of the manufacturing of the final product itself.

No co-products or recycled products are used in the manufacture of the product. Renewable energy is not used in the manufacturing plant and carbon offsets are not used either.

Design and Construction Stage

This stage begins with the final product leaving the production facility and ends with the final product application on site, which includes transportation to distribution center, transportation to point of sale and transportation to application site. These stages (Modules 4-5) were not included in the analysis because the exact location of the product application was unknown and this study was focused on the analysis of the manufacturing of the final product itself.

Use and Maintenance Stage

The application of the final product is with brush or roller and does not require energy. There is no reliable way to account for the impact of the applicator, as these may be used once or several times and the area covered may vary considerably from project to project. This impact is not expected to be representative and therefore was not considered in the scope of this study. In addition, this study was focused on the analysis of the manufacturing of the final product itself.

End-of-Life Stages

The product service life is 5 years. Once the product is installed, the product remains in the building and may be assumed that it is sent to landfill. This stage is not included as this study was focused on the analysis of the manufacturing of the final product itself.

4. CUT-OFF RULES

Model was developed to meet at minimum of 95% of the total mass, energy, and environmental relevance of the system. The criterion for exclusion of inputs and outputs was the following:

- All inputs and outputs have been included in cases where the necessary information is readily available or a reasonable estimate could be made.
- In cases where information is not available, inputs and outputs may have been omitted only if their impacts are anticipated to fall well below 1% of the total system impacts.
- For materials characterized as hazardous and/or toxic by the Globally Harmonized System (GHS), cut-off rules do not apply and such substances shall be included in the inventory.

5. ALLOCATION RULES

No allocation was needed in the documented input data (foreground data). However, some of the used LCI inventory data (pre-products and background data) are allocated inventories using common allocation approaches, such as physical allocation or economic allocation. The assumptions concerning allocation are documented in the corresponding databases.

6. MODEL

Impact category	Indicator		Source
Climate change (CF)	Kg CO_2 eq	Bern model – Global Warming Potential over a 100 year time horizon	IPCC 2013

All six Kyoto gases plus NF3 were accounted for in the model, measured by mass and converted into CO2 equivalents using the 100-year global warming potential (GWP) coefficients of the 2013 IPCC Assessment Report as currently used by the EU PEF (2017).

DATA

1. TYPES AND SOURCES OF DATA

The study was modelled using primary data collected directly from the manufacturer to represent the product manufacturing process. When primary data was unavailable, secondary data were used where necessary to complete assessment. Secondary data sources include BASF and GaBi ts (DB version 9.2.0.58). Secondary data sets were based on primary data from internationally adopted production processes.

Data sets selected for raw materials use LCIs that cover manufacturing and all relevant process steps and technologies over the supply chain of the represented cradle to gate inventory with a good overall data quality.

A proxy for electricity (Mexico electricity grid mix) was selected.

Data sources	
Pinturas Thermicas del Norte SA de CV	Primary data
GaBi ts DB version 9.2.0.58	Secondary data
BASF	Secondary data

2. DATA QUALITY

Data were selected considering availability, representativeness of manufacturing process, completeness, consistency, accuracy and geographic and temporal relevance. Primary and secondary data is less than five years old. Production data refers to 2018 and secondary data was selected to be as close as possible to the reference year 2018. The overall data quality is considered to be good.

3. SENSITIVITY ANALYSIS

No additional sensitivity analyses are required, but can be conducted and included if necessary.

RESULTS

PCF for THERMOTEK® DOBLE ACCIÓN FIBRATADO Tipo 5A		
Total PCF	PCF (non-biogenic)	PCF (biogenic)
0.295 kg $CO_{2\text{-eq}}$	0.287 kg $CO_{2\text{-eq}}$	0.00881 kg $CO_{2\text{-eq}}$

Total PCF: represents the sum of PCF (non-biogenic) and PCF (biogenic).

Notes:

- Results for PCF (non-biogenic) include land use change impacts and peat impact of CO_2.
- CO_2 removal by biogenic sources is accounted for in Total PCF and reported with PCF (biogenic).
- PCF (biogenic) considers the biogenic CO_2 uptake in the final product and other net biogenic emissions.
- Emissions and removal of GHG that result of biogenic sources and fossil carbon are calculated and reported separately.
- GHG emissions that are associated with electricity use are reported.
- GHG emissions that result from air transport are not relevant to this study.

RESULTS INTERPRETATION

Raw materials represent the highest burden in the PCF. Titanium dioxide used as colorant to form the coating requires high portions of energy for its production.

Depending on the surface characteristics, 1.2 L of coating is required to cover 1 m^2. In order to minimize the PCF, it is suggested to enhance the product durability and performance. This way, a smaller amount of product is required during the building lifetime.

LIMITATIONS

The PCF results shall be interpreted in consideration of the following limitations:

- This analysis was a preliminary review based on the product, with a cradle to gate scope. Design and construction, use and maintenance, and end-of-life stages were excluded from the system boundaries. Therefore, PCF results do not represent the impact for all the product life cycle.
- This study is focused on reporting PCF and no other environmental impacts that may be of interest (e.g. resource depletion) are here reported. When information of this PCF is used for decision making, other environmental impacts shall be considered.
- When primary data were unavailable, secondary data were used to complete assessment. Data were selected considering availability, representativeness of manufacturing process, completeness, consistency, accuracy and geographic and temporal relevance.
- Some processes were not accounted for in the model as data were not available. This include waste and scrap created during manufacturing of raw materials, transportation of raw materials waste to the disposal site and transportation of raw materials (other than limestone) to the production facility.
- The model was developed with the use of primary data collected directly from the manufacturer in Mexico. PCF may vary in other regions and production facilities.

OTHER ENVIRONMENTAL INFORMATION

The product THERMOTEK® DOBLE ACCIÓN FIBRATADO Tipo 5A contributes to reduce energy consumption used for cooling during a building´s operation due to its high SRI. However, this contribution is not accounted for in the scope of this study.

ABBREVIATED TERMS

PCF	Product carbon footprint
PCR	Product Category Rule
CO_2	Carbon dioxide
CO_{2e}	Equivalent carbon dioxide
GHG	Greenhouse gases
LCI	Life cycle inventory
IPCC	Intergovernmental Panel on Climate Change

REFERENCES

1) Instituto Mexicano de Normalización y Certificación, A.C. (2019). NMX-SAA-14067-IMNC-2018 Gases de efecto invernadero-Huella de carbono de productos-Requisitos y directrices para cuantificación y comunicación. pp.1-59.

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