

Environmental Product Declaration

Ingevity

Warm Mix Asphalt Additive, Warm Mix Asphalt Chemical Additive, Warm Mix Asphalt Chemical Package, Liquid Anti-Strip, Compaction Aid

Product

Evotherm M1

Third party reviewed core EPD based on the EN15804:2012 + A2

Issue Date	12/26/2022
Valid until	12/25/2027
Collection period	2020
Version	1.4

Company

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DEMONSTRATION OF VERIFICATION

EN 15804:2012+A2:2019/AC:2021 serves as core PCR
Third party verification of the declaration, according to ISO 14025

- ☒ Internal Third party verifier
- ☒ External Lead reviewer Brad McAllister, WAP
Sustainability & co-lead reviewer Amlan Mukherjee, PhD, PE, Michigan Technological University

Data on this certificate have been generated by The Right Environment, Ltd. using SimaPro. Primary data has been collected for the processes controlled by Ingevity for the year 2020. Background data for energy, electricity and transportation are based on the NAPA PCR v2.

As a general rule, a comparison or evaluation of EPD data is only possible when all of the data records to be compared have been drawn up in accordance with EN 15804 and the building context and/or product-specific performance features are taken into consideration. EPDs of construction products may not be comparable if the requirements in EN 15804 section 5.3 are not met, the EPDs are not seen in a building context, and other requirements (e.g. background LCI data, assumptions around onsite emission measurements, type of EPD, reference service life, boundary conditions and functionality) are not equivalent.

Declared unit

1 metric ton (1000 kg)

Representative market

Ingevity Evotherm M1 product is produced in N. Charleston, SC (U.S.A.) for North American Markets.

Product description and intended use

The main application of this product is low temperature manufacture and placement of asphalt paving mixtures. This product is used to manufacture and place asphalt paving mixtures at warm mix asphalt temperatures. As such, it functions concomitantly as a coating aid, compaction aid, and liquid anti-stripping agent/adhesion promoter. This product constitutes typically 0.5% wt of an asphalt paving mixture. ***To access the contribution of this product to the asphalt paving mixture, the declared results need to be scaled accordingly.***

The comparison of products on the basis of their EPD is defined by the contribution they have to the environmental performance on asphalt mixture manufacture and asphalt pavement construction. Consequently comparison of the environmental performance of construction products using the EPD information shall be based on the product's use in and its impacts on the construction

materials and works, and shall consider the complete life cycle (all information modules), meaning cradle-to-grave. In addition to the environmental impacts covered in a cradle-to-grave LCA, the durability of a product's performance in the application needs to be evaluated.

Declaration of material content

Density	0.97 kg/l
Water	0% wt.

Reference

All information related to the content and safety of our products can be obtained by contacting Ingevity Pavement Technologies technical support at +1 843-746-8464 or evotherm@ingevity.com.

Safety data sheet

Evotherm M1 is manufactured using common, industrial-scale specialty chemicals manufacturing processes compliant with ISO 9001:2015 quality management requirements. Ingevity Evotherm M1 is neither a PBT (persistent, bioaccumulative, and toxic) substance nor does not contain substances of very high concern that are as listed by the European Chemicals Agency. Ingevity Evotherm M1 is safe to use and carries the sensitizer and aquatic hazard labels. If more information is required, please contact Ingevity at +1 843-746-8464 or evotherm@ingevity.com.



Life-Cycle Assessment: Calculation Rules

System boundaries and flow diagram

The process tree for the declared product (material and energy inputs smaller than 1% excluded from flow chart). The fate of this product in the use phase is not modeled and hence not included in this EPD.

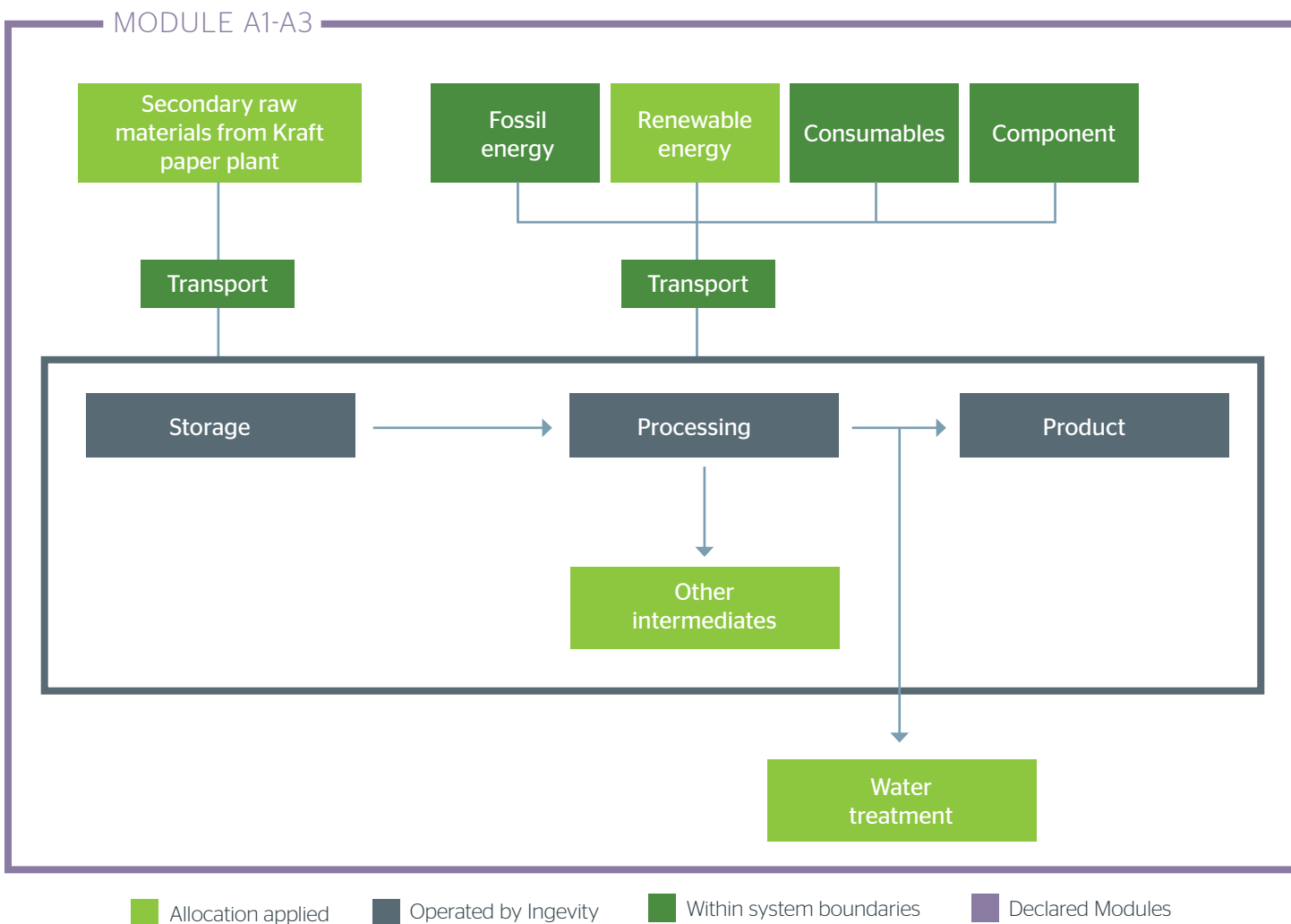
Other rules

The biogenic carbon content and both renewable and fossil feedstock energy content of Evotherm M1 are declared. Economic allocation has been used for the use of a by-product of the kraft paper industry. Mass allocation has been used for the processing at Ingevity. Suppliers have been contacted but literature data has been used for some of the components of Evotherm M1. Packaging has been excluded.

EDP type

Cradle-to-gate

Ingevity admixtures are used in an asphalt mix. Only module A1, A2 and A3 are declared.



Environmental profile (TRACI 2.1)

		Product stage	Delivery	Installation	Use and maintenance	End-of-life				Moldule D
Parameter	Unit	A1, A2, A3	A4	A5	B1 - B7	C1	C2	C3	C4	D
Global Warming*	kg CO2	2.65E + 03	MND	MND	MND	MND	MND	MND	MND	MND
Ozone Depletion	kg CFK11	1.35E - 03	MND	MND	MND	MND	MND	MND	MND	MND
Eutrophication	kg N eq	8.50E + 00	MND	MND	MND	MND	MND	MND	MND	MND
Acidification	kg SO2	1.48E + 01	MND	MND	MND	MND	MND	MND	MND	MND
Smog	kg O3	1.52E + 02	MND	MND	MND	MND	MND	MND	MND	MND

*Global warming includes emissions of greenhouse gasses from fossil and biogenic fuels (BCPE and BCWR), biogenic carbon removals associated with biogenic carbon content (BCPR) contained within bio-based products in the product and the emissions and sequestration due to land use and land use change (GHGluC). Impacts from LULUC represent less than 1% of the Global Warming impacts reported in the TRACI table and are therefore insignificant.

Biogenic carbon (in product)

		Product stage
Parameter	Unit	A1, A2, A3
Biogenic carbon (in product)	ton C	3.23E - 01
Biogenic carbon (in product)	kg CO2 eq	118E+03

Climate Change (EN 15804:2021+A2)

		Product stage
Parameter	Unit	A1, A2, A3
Climate Change - Total	kg CO2 eq	2.65E + 03
Climate Change - Fossil	kg CO2 eq	3.83E + 03
Climate Change - Biogenic	kg CO2 eq	-1.18E + 03
Climate Change - Land use and LU Change	kg CO2 eq	7.04E - 02

Other information

Emissions

There are no indoor air health quality related concerns for the use of the products declared as the application is outdoors. There are no emissions to soil and water during the use stage.

Normative references

- ASTM D803-15 (2020) Standard Test Methods for Testing Tall Oil
- ASTM D6816-11 (2016) Standard Practice for Determining Low-Temperature Performance Grade (PG) of Asphalt Binders (equivalent to AASHTO R49)
- ASTM D7643-16 Standard Practice for Determining the Continuous Grading Temperatures and Continuous Grades for PG Graded Asphalt Binders (equivalent to AASHTO M320)
- ASTM D6373-21 Standard Specification for Performance-Graded Asphalt Binder (equivalent to AASHTO M332)
- ASTM D2726/D2726M-19 Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Asphalt Mixtures (equivalent to AASHTO T166)

Standards that apply to methodology and rules for this EPD:

- ISO 14040:2006: Environmental Management-Life Cycle Assessment-Principles and framework
- ISO 14044:2006: Environmental Management-Life Cycle Assessment-Requirements and guidelines
- ISO 14025:2006: Environmental labels and Declarations-Type III Environmental Declarations-Principles and procedures
- EN 15804+A2:2019

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