Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019/AC:2021 for:

MOFALT (Polymer Modified Bitumen)

MOFALT 25/55-55A, MOFALT 25/55-65, MOFALT 45/80-65, MOFALT 25/55-60

from PARAMO, a.s.

Programme:	Czech Environmental Information Agency (CENIA), "National programme of environmental labelling" - CZ
Programme operator:	CENIA, Czech Environmental Information Agency, Executive body of NPEZ Agency
EPD owner:	PARAMO, a.s.
Author:	LCA Studio s.r.o.
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Valid until:	23. 10. 2030

GENERAL INFORMATION

Followed standards and third-party verification	
Standards	This EPD is carried out according to ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021
Third-party verification	Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ Individual EPD verification without a pre-verified LCA/EPD tool Third-party verifier: prof. Ing. Silvia Vilčeková, PhD., Silcert, s.r.o.
	Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No
LCA practitioner, commissioned by the owner of the EPD	
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The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.

For further information about comparability, see EN 15804 and ISO 14025.

COMPANY INFORMATION

Owner of the EPD	
Name	PARAMO, a.s.
Address	Přerovská 560, 530 06 Pardubice, Czech Republic, www.paramo.cz
Contact	paramo@paramo.cz

Description of the EPD owner organisation:

PARAMO, a.s. is a traditional Czech industrial company with a proud history dating back to 1889, when it began operations at its Pardubice plant. Over more than a century of continuous development, the company has evolved from a classical refining enterprise into a specialized manufacturer of asphalt products, process oils for the rubber and chemical industries, and a trusted operator of fuel terminals.

Since the year 2000, PARAMO, a.s. has been part of the ORLEN Unipetrol Group, the largest refining and petrochemical group in the Czech Republic, and a member of the international ORLEN Group. This strategic partnership strengthens the company's market position, allows access to advanced know-how, and supports innovation in both production processes and customer solutions.

Today, PARAMO, a.s. designs, manufactures, and distributes its products using a combination of time-tested refining expertise and state-of-the-art technologies. The company's experienced team of engineers and specialists continuously innovates product design and processing technologies, ensuring that PARAMO, a.s. meets European quality and environmental standards.

A key element of the company's philosophy is a strong commitment to sustainability and environmental responsibility. In recent decades, PARAMO, a.s. has significantly modernized its production infrastructure to minimize energy consumption, reduce emissions, and implement sustainable solutions across its value chain. This includes integrating environmentally responsible approaches into the design of asphalt solutions, the formulation of process oils, and the safe, efficient operation of fuel terminals.

With decades of expertise, a culture of innovation, and a proven ability to adapt to changing industrial and environmental requirements, PARAMO, a.s. has established itself as a reliable partner for customers both in the Czech Republic and abroad. Its products support a wide range of industries, from road construction and infrastructure development to the rubber and chemical sectors.

Through its focus on quality, safety, and sustainability, PARAMO, a.s. continues to build on its long-standing tradition while looking toward the future. By combining historical experience with modern innovation, the company delivers industrial solutions that meet the evolving needs of customers and contribute to the development of a more sustainable economy. PARAMO, a.s. is certified according to ISO 9001, 14001, 45001.

Location of the production site:

The production plant is located in Pardubice, Czech Republic.

PRODUCT INFORMATION

This EPD is valid for the following products:	MOFALT 25/55-55 MOFALT 25/55-60 MOFALT 25/55-65 MOFALT 45/80-65
UN CPC code	1533. Bitumen and asphalt, natural; asphaltites and asphaltic rock

Product identification: MOFALTs are Polymer Modified Bitumen (PMB) consisted of mixture of asphalt, oxidized (CAS: 64742-93) with homogeneously dispersed polymers

Polymer Modified Bitumen (PMB) are a high-performance road binders developed to deliver superior durability, elasticity, and resistance to deformation in modern asphalt applications. By blending bitumen with selected polymers, PMB provides asphalt mixtures with enhanced flexibility and strength, ensuring long-lasting performance under heavy traffic loads and challenging climate conditions.

In asphalt production, PMB are combined with aggregates in asphalt plants to create tailor-made mixtures. By adjusting the composition and type of PMB used, asphalt can be customized to specific requirements, such as increased resistance to rutting, cracking, or temperature fluctuations, making them suitable for a wide range of road construction and maintenance projects.

MOFALT modified asphalts from PARAMO, a.s. represent a specialized range of homogeneous elastomer-modified binders based on high-quality petroleum asphalt. At ambient temperatures, they are semi-solid to solid products free from water and mechanical impurities, ensuring reliable handling and application.

The MOFALT product line includes several grades, such as MOFALT 25/55-55A, MOFALT 25/55-65, MOFALT 45/80-65, and MOFALT 25/55-60, produced in penetration classes 25/55 x 0.1 mm and 45/80 x 0.1 mm. Each type is designed with specific performance characteristics, differing primarily in softening point and breaking point values, which allow engineers and contractors to select the most suitable binder for the intended area of use.

By combining advanced modification technology with strict quality standards, PMB from PARAMO, a.s. ensures safer, more resilient, and longer-lasting road surfaces, supporting the construction of sustainable infrastructure across diverse environments.

All products are marked with the CE mark to indicate compliance with the European harmonised standard EN 14023 - Bitumen and bituminous binders - Specification framework for polymer modified bitumen.

Technical specifications of products

Parameter	Test method	MOFALT 25/55-55A	MOFALT 25/55-65	MOFALT 45/80-65	MOFALT 25/55-60
Penetration at 25 °C	EN 1426	25-55 0,1mm	25-55 0,1 mm	45-80 0,1 mm	25-55 0,1 mm
Softening point RB	EN 1427	55 - 63 °C	≥ 65 °C	≥ 65 °C	≥ 60 °C
Fraass breaking point	EN 12593	≤ -10 °C	≤ -12 °C	≤ -15 °C	≤ -12 °C

Force ductility	EN 13589	≥ 2 J/cm² at 10 °C	≥ 3 J/cm² at 10 °C	≥ 3 J/cm² at 5 °C	≥ 2 J/cm² at 10 °C
Elastic recovery at 25 °C	EN 13398	≥ 50 %	≥ 70 %	≥ 70 %	≥ 60 %
Resistance to hardening under influence of heat and air (EN 12607-1) at 163 °C					
Retained penetration at 25 °C		≥ 60 %	≥ 60 %	≥ 60 %	≥ 60 %
Increase in softening point		≤ 8 °C	≤ 10 °C	≤ 10 °C	≤ 8 °C

CONTENT DECLARATION

Product content	Mass [kg]	Biogenic material, kg of C per declared unit
Asphalt / asphalt oxidized	976	0
Additives and polymers	24	0
TOTAL	1000	0

The products are transported to the customer in a hot state in tanks in accordance with ADR regulations. The products are pumped directly into the tanker via a pipe. Packing material is not used.

The products do not contain any substances of very high concern (SVHC) according to REACH.

The products do not contain recycled materials.

LCA INFORMATION

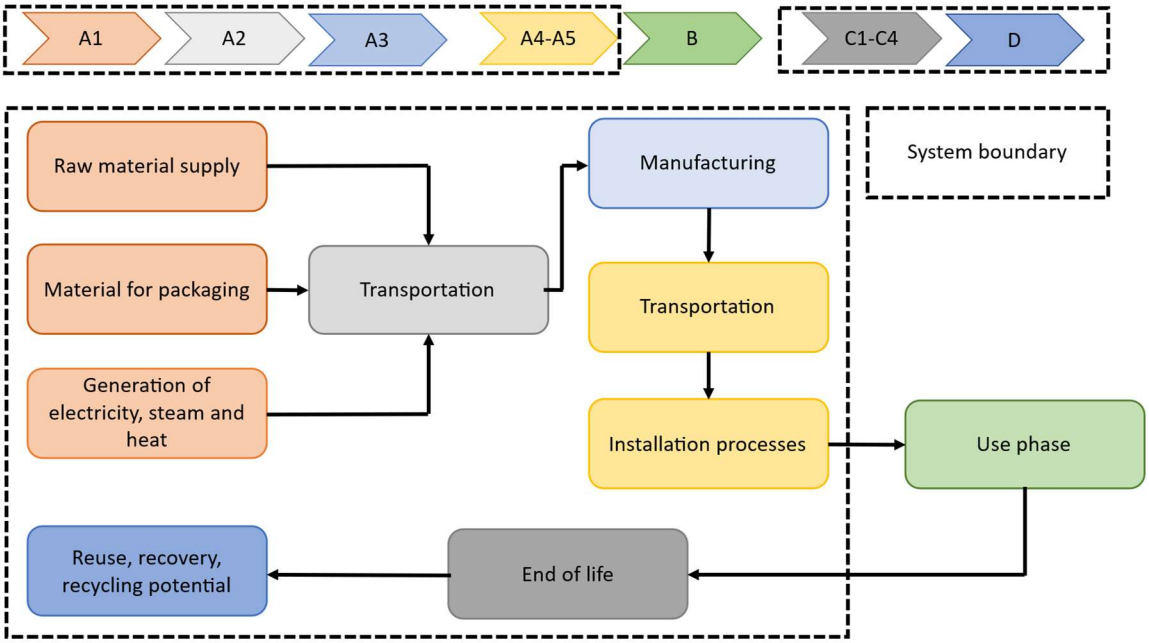
Functional/Declared unit	1 t of Polymer Modified Bitumen
Time representativeness:	Site specific data from producer is based on 1 year average for process data (reference year 2024). Time scope less than 10-years was applied for background data. Time scope less than 2 years was applied for specific data.
Cut off rules:	The cut-off criterion was determined according to the EN 15804:2012+A2:2019/AC:2021 standard. In line with the requirements, more than 99 % of flows were included.
Database(s) and LCA software used:	LCA for Experts (version 10.9.1.17), Sphera database (2025.1) and ecoinvent database (version 3.11).
Allocations:	The general allocation rule was based on 1 t of the product. No secondary materials or fuels were used in production.
Geographical scope:	Czech Republic, Europe, Global

Electricity mix	Generation of electricity consumed within the production was based on the Czech residual electricity mix.
Characterization factors	Characterisation factors are based on Environmental Footprint (EF) 3.1

System boundary

The system boundary is “cradle-to-gate” with options, modules C1-C4, module D and optional modules A4, A5. It covers the production of raw materials, all relevant transport down to factory gate and manufacturing by PARAMO, a.s., construction, deconstruction, transport to recovery facility and recovery of product. The review framework comprises the following details:

- Raw materials acquisition and transport
- Further processing of raw materials
- Production operations
- Energy and water consumption
- Waste management
- Construction
- Deconstruction
- Recovery



Module A1 covers the production of materials and components for PARAMO, a.s. and also it includes fuels and energy carriers. This consists of the production of input materials as asphalt or additives.
Module A2 covers the transport of material into the site of production PARAMO, a.s. Generic DB processes with site-specific parameters for distance were used.
Module A3 covers on-site operated processes dealing with MOFALT production. These processes are under the operational control of PARAMO, a.s., and these are specific processes modelled based on data collection.
Module A4 covers the transport of products to the customers of PARAMO, a.s. Generic DB processes with site-specific parameters for distance were used. A weighted average of transportation modes and distances, based on deliveries to several customers/markets and representing the geographical scope of the EPD, was applied.
Module A5 covers processes related to the construction of MOFALT on the construction site. It includes the fuel consumption of machinery used for MOFALT installation, as well as the water consumption (diesel: 0,45 l/t, water: 4 l/t).

Module C1 covers estimated energy for deconstruction related to the mass of deconstructed material. 5 kWh/t of energy carrier diesel was used for deconstruction of MOFALT.
Module C2 covers the transport of material into processing facility. Generic DB processes with estimated general distances were used. Distance for the transport of material for recycling was set at 80 km.
Module C3 covers the processing of deconstructed MOFALT. It is assumed that 100 % of the site-won asphalt is processed into reclaimed asphalt, with machinery consuming 0,37 litres of diesel per ton.
Module C4 is not applicable. It is assumed, that 100 % of site-won asphalt shall be processed to reclaimed asphalt for reuse.
Module D covers the declared benefits from asphalt reuse. 4 % of the asphalt mass is lost during the use phase (modules not covered in this study).

A1 - A3 Product stage	Raw material supply	A1	X
	Transport	A2	X
	Manufacturing	A3	X
A4 - A5 Construction process	Transport from the gate to the site	A4	X
	Assembly	A5	X
B1 - B7 Use stage	Use	B1	ND
	Maintenance	B2	ND
	Repair	B3	ND
	Replacement	B4	ND
	Refurbishment	B5	ND
	Operational water use	B6	ND
	Operational energy use	B7	ND
C1 - C4 End of life stage	De-construction	C1	X
	Transport	C2	X
	Waste processing	C3	X
	Disposal	C4	X
D Benefits and loads beyond the system boundaries	Reuse- Recycling - Recovery Potential	D	X

X = declared module, ND = not declared module

ENVIRONMENTAL PERFORMANCE

Impact contribution

The share of the primary data on GWP-GHG indicator results is 4,7 % for electricity and 2,4 % for transport for the **MOFALT** product. The process that contributes to more than 10 % of the total GWP-GHG indicator is asphalt production. GWP-GHG indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product.

Environmental indicators

Environmental indicator results per declared unit for each module are reported in the following tables.

Environmental indicator results are calculated according to ISO 14025 and EN 15804+A2:2019. Results are expressed per declared unit – 1 t of Polymer Modified Bitumen

Life cycle impact assessment results of the MOFALT.

Indicators	A1-A3	A4	A5	C1	C2	C3	C4	D
1. Environmental impact indicators [unit]								
GWP-GHG [kg CO_2 eq.]	8,67E+02	1,78E+01	1,66E+00	1,81E+00	7,82E+00	1,36E+00	0,00E+00	-3,74E+01
Climate Change - total [kg CO_2 eq.]	8,68E+02	1,78E+01	1,66E+00	1,81E+00	7,80E+00	1,36E+00	0,00E+00	-3,73E+01
Climate Change, fossil [kg CO_2 eq.]	8,64E+02	1,76E+01	1,66E+00	1,81E+00	7,72E+00	1,36E+00	0,00E+00	-3,72E+01
Climate Change, biogenic [kg CO_2 eq.]	3,87E+00	1,56E-03	5,38E-04	3,67E-04	6,82E-04	2,76E-04	0,00E+00	0,00E+00
Climate Change, land use and land use change [kg CO_2 eq.]	3,83E-01	1,81E-01	1,78E-04	1,85E-04	7,92E-02	1,39E-04	0,00E+00	-3,44E-02
Ozone depletion [kg CFC-11 eq.]	1,04E-06	2,91E-12	2,46E-08	2,69E-08	1,28E-12	2,02E-08	0,00E+00	-2,24E-08
Acidification [Mole of H^+ eq.]	2,03E+00	2,91E-02	1,48E-02	1,62E-02	4,02E-02	1,22E-02	0,00E+00	-1,12E-01
Eutrophication, freshwater [kg P eq.]	9,57E-03	4,73E-05	5,36E-05	5,84E-05	2,07E-05	4,40E-05	0,00E+00	-1,09E-03
Eutrophication, marine [kg N eq.]	4,40E-01	1,21E-02	6,91E-03	7,55E-03	1,98E-02	5,68E-03	0,00E+00	-2,42E-02
Eutrophication, terrestrial [Mole of N eq.]	4,75E+00	1,29E-01	7,56E-02	8,25E-02	2,15E-01	6,21E-02	0,00E+00	-2,68E-01
Photochemical ozone formation, human health [kg NMVOC eq.]	2,23E+00	2,63E-02	2,26E-02	2,47E-02	3,83E-02	1,86E-02	0,00E+00	-1,23E-01
Resource use, mineral and metals [kg Sb eq.]	4,50E-04	1,17E-06	5,92E-07	6,47E-07	5,12E-07	4,87E-07	0,00E+00	-1,09E-05
Resource use, fossils [MJ]	4,85E+04	2,25E+02	2,15E+01	2,34E+01	9,86E+01	1,76E+01	0,00E+00	-2,59E+03
Water use [m^3 world equiv.]	3,17E+01	8,03E-02	2,38E-01	7,15E-02	3,52E-02	5,38E-02	0,00E+00	-4,46E+00
2. Resource use indicators [unit]								
Use of renewable primary energy (PERE) [MJ]	3,46E+02	1,70E+01	1,70E-01	1,49E-01	7,43E+00	1,12E-01	0,00E+00	-3,52E+01
Primary energy resources used as raw materials (PERM) [MJ]	6,60E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (PERT) [MJ]	3,53E+02	1,70E+01	1,70E-01	1,49E-01	7,43E+00	1,12E-01	0,00E+00	-3,52E+01

Use of non-renewable primary energy (PENRE) [MJ]	4,79E+04	2,25E+02	2,15E+01	2,34E+01	9,86E+01	1,76E+01	0,00E+00	-2,59E+03
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	6,41E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (PENRT) [MJ]	4,85E+04	2,25E+02	2,15E+01	2,34E+01	9,86E+01	1,76E+01	0,00E+00	-2,59E+03
Use of net fresh water (FW) [m^3]	1,21E+00	8,38E-03	5,54E-03	1,66E-03	3,67E-03	1,25E-03	0,00E+00	-1,16E-01
3. Output flows and waste categories [unit]								
Hazardous waste disposed (HWD) [kg]	1,25E+00	9,02E-09	1,91E-02	2,09E-02	3,96E-09	1,57E-02	0,00E+00	-5,21E-02
Non-hazardous waste disposed (NHWD) [kg]	2,86E+01	3,14E-02	1,42E-01	1,55E-01	1,38E-02	1,17E-01	0,00E+00	-2,25E+01
Radioactive waste disposed (RWD) [kg]	1,80E-01	4,24E-04	6,10E-06	0,00E+00	1,86E-04	0,00E+00	0,00E+00	-5,04E-03
4. Optional indicators [unit]								
Particulate matter [Disease incidences]	2,27E-05	2,88E-07	4,18E-07	4,57E-07	2,26E-07	3,44E-07	0,00E+00	-1,72E-06
Ionising radiation, human health [kBq U235 eq.]	1,78E+01	6,10E-02	1,01E-02	1,01E-02	2,67E-02	7,57E-03	0,00E+00	-1,23E+00
Ecotoxicity, freshwater [CTUe]	3,28E+04	2,92E+02	1,20E+00	1,25E+00	1,28E+02	9,40E-01	0,00E+00	-1,88E+03
Human toxicity, cancer [CTUh]	5,66E-07	3,94E-09	1,81E-10	1,95E-10	1,73E-09	1,47E-10	0,00E+00	-2,92E-08
Human toxicity, non-cancer [CTUh]	1,19E-05	2,21E-07	2,81E-09	2,97E-09	9,67E-08	2,24E-09	0,00E+00	-4,84E-07
Land Use [Pt]	5,69E+02	9,94E+01	1,44E+00	1,55E+00	4,36E+01	1,17E+00	0,00E+00	-3,20E+01

RELEASE OF DANGEROUS SUBSTANCES DURING THE USE STAGE

No health and environmental impacts during use are observed.

ADDITIONAL ENVIRONMENTAL INFORMATION

PARAMO, a.s. holds certification under the internationally recognized standard ISO 14001:2015, which reflects the company's long-term commitment to responsible environmental management, efficient use of natural resources, and sustainable energy practices. By adhering to this standard, PARAMO, a.s. demonstrates its ability to systematically identify, monitor, and reduce its environmental impact while continuously improving processes in line with global sustainability goals.

As an active participant in the European Union's CO_2 Emissions Trading System (ETS), PARAMO, a.s. directly contributes to worldwide efforts to mitigate climate change. This participation not only underscores the company's responsibility for reducing greenhouse gas emissions but also ensures full compliance with regulatory frameworks designed to protect the environment for future generations.

The company's products fully comply with EU REACH legislation and are carefully developed to meet the strictest safety and environmental requirements. Importantly, PARAMO, a.s. guarantees that none of its products contain Substances of Very High Concern (SVHC) above the 0,1 % (w/w) threshold, ensuring the highest standards of environmental and human health protection.

In its production processes, PARAMO, a.s. makes extensive use of modern, energy-efficient technologies. These technologies are specifically designed to optimize energy consumption, reduce emissions, and maintain strict adherence to European and national environmental protection standards. Through continuous innovation, the company seeks to further reduce its ecological footprint and achieve sustainable growth.

When it comes to logistics and handling, asphalt products are typically delivered in tank trucks, metal barrels, or canisters, depending on customer requirements. Solid asphalt products may also be packaged in durable cardboard boxes to ensure safe transportation and storage. In line with environmental protection regulations, any unused bitumen materials must be disposed of responsibly, classified as either construction waste or bitumen waste (17 09 04 / 05 01 17), to prevent any negative impact on the environment.

At the core of its strategy, PARAMO, a.s. emphasizes sustainability, innovation, and responsible collaboration. These values guide the company in delivering high-quality asphalt materials that bring added value to both domestic and international customers while respecting the environment and natural resources.

The company also places a strong focus on employee education, training, and workplace safety, with programs designed to support professional growth and align with the ISO 45001:2018 occupational health and safety standard. By fostering a culture of safety, responsibility, and continuous development, PARAMO, a.s. ensures that its workforce is fully equipped to contribute to sustainable operations.

Through these initiatives, PARAMO, a.s. demonstrates that its mission extends beyond business success. The company actively invests in technologies and processes that reduce environmental impact, support the principles of a circular economy, and contribute to a more sustainable future.

REFERENCES

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ISO 14025: EN ISO 14025:2006-11: Environmental labels and declarations - Type III environmental declarations — Principles and procedures

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