



# An Environmental Product Declaration for Asphalt Mixtures

## Company

**Francis O. Day Company, Inc. is an asphalt mixture producer.**

**F.O. Day Bituminous**

13900 Piney Meeting House Rd  
Rockville, MD

## Product Description

This EPD reports the impacts for 12.5mm NRC, a Dense Graded Superpave asphalt mixture which can be incorporated as part of the structure for a roadway, parking lot and recreational pavement and meets mix specifications provided for its application.

This asphalt mixture is categorized as a hot mix. This asphalt mixture was produced within a temperature range of 280.0 to 320.0 °F.



**Declaration Number:** 33.91.180 v2 **Emerald EcoLabel Version:** 1.1.3

**Date of Issue:** Feb 24, 2021

**Period of Validity:** Jan 31, 2022

This declaration is an environmental product declaration in accordance with ISO 14025:2006<sup>1</sup> Type III environmental performance labels and European Committee for Standardization (CEN)

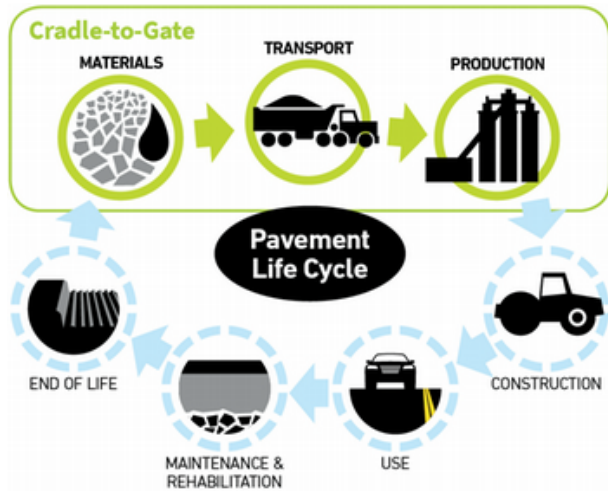
EN 15804:2012<sup>2</sup>, which transparently describes the potential environmental impacts of the described product caused during the identified stages. The data specific to this product can be found on page 3 of this document.

# An Environmental Product Declaration for Asphalt Mixtures

## Life Cycle Assessment

### DECLARED UNIT

The declared unit is 1 short ton of an asphalt mixture (UNSPSC Code 30111509: Asphalt Based Concrete) as defined as “a plant-produced composite material of aggregates, asphalt binder, and other materials.”<sup>3</sup>



The three green icons represent the cradle-to-gate data used to create the Emerald Eco-Label Environmental Product Declaration (EPD) for asphalt pavement mixtures.

### LIFE CYCLE PHASES

This EPD covers the raw material supply, transport, and production life cycle phases (A1-A3). It does not include construction (placement and compaction), use, maintenance, rehabilitation, or the end-of-life life cycle phases (phases A4, A5, B1-7, and C1-4).<sup>4</sup>

**Materials (A1):** This stage includes raw material extraction, refining, and energy production.

**Transport (A2):** This stage includes transport of raw materials to the asphalt plant.

**Production (A3):** This stage comprises all plant operations involved in the production of asphalt mixtures. Data for this stage is plant-specific.

### LIFE CYCLE INVENTORY

This EPD was created using plant-specific data for asphalt mix production of the manufacturing life cycle phase. Potential variations due to asphalt mixture design, supplier locations, manufacturing processes, efficiencies, and fuel use are accounted for in this EPD. All other upstream data sources were prescribed and are publicly available and freely accessible to ensure transparency and comparability. Use of the prescribed data sources ensures comparability among the EPDs developed by limiting any variability due to differences in the upstream data within the system boundaries.<sup>5</sup>

## Environmental Impacts

The life cycle impact assessment results are relative expressions and do not predict actual impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

### INTERPRETATION

The information presented in this EPD can be used to model the environmental impacts of asphalt mixtures purposed to be part of (but not limited to) roadway, parking lot or recreational pavements. This EPD alone does not provide the environmental impacts of the entire pavement structure itself and does not make any statements that the product covered by the EPD is better or worse than any other product.

Comparison of the environmental performance of asphalt mixtures using EPD information shall be based on the product's performance and function, and therefore EPDs shall not be used for comparability purposes when the asphalt mixture performance and functions are not the same. NAPA verified asphalt mixture EPDs that are expected to meet the same performance and function can be compared. EPDs of other programs may not be comparable because they could be calculated using a different PCR.

### ADDITIONAL ENVIRONMENTAL INFORMATION

None

### DECLARATION OF LIMITATIONS

This EPD reports the results of a cradle-to-gate LCA for asphalt mixtures. This EPD may be used as a data input for full life cycle assessments to compare the environmental impacts of different asphalt roadway, parking lot, or recreational pavement design alternatives.

### DATA GAPS

None

# An Environmental Product Declaration for Asphalt Mixtures

## Results of the LCA – Resource Use

PARAMETER	UNIT	A1	A2	A3
PERE	MJ, net calorific value	0.988	0	0.421
PERM	MJ, net calorific value	0	0	0
PERT	MJ, net calorific value	0.988	0	0.421
PENRE	MJ, net calorific value	5.2	61.5	414
PENRM	MJ, net calorific value	1.9e+03	0	0
PENRT	MJ, net calorific value	1.9e+03	61.5	414
SM	Kg	0	0	0
RSF	MJ, net calorific value	0	0	0
NRSF	MJ, net calorific value	0	0	0.0782
FW	M3	0	0	1.69e-08

PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PENRM	Use of non renewable primary energy resources used as raw materials
PERM	Use of renewable primary energy resources used as raw materials	PENRT	Total use of non renewable primary energy resources (primary energy and primary energy resources used as raw materials)
PERT	Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	SM	Use of secondary materials
PENRE	Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials	RSF	Use of renewable secondary fuels
		NRSF	Use of non renewable secondary fuels
		FW	Net use of fresh water

## Results of the LCA – Output Flows and Waste Categories

PARAMETER	UNIT	A1	A2	A3
HWD	Kg	MND*	MND*	0
NHWD	Kg	MND*	MND*	0
RWD	Kg	MND*	MND*	0
CRU	Kg	0	0	0
MFR	Kg	0	0	0
MET	Kg	0	0	0
EEE	MJ, net calorific value	0	0	0
EET	MJ, net calorific value	0	0	0

HWD	Disposed-of hazardous waste	MFR	Materials for recycling
NHWD	Disposed-of non-hazardous waste	MET	Materials for energy recovery
RWD	Disposed-of radioactive waste	EEE	Exported electrical energy
CRU	Components for reuse	EET	Exported thermal energy

\*Module Not Disclosed: Insufficient data available to calculate this value

## An Environmental Product Declaration for Asphalt Mixtures

### Results of the LCA – Environmental Impact, TRACI

PARAMETER	UNIT	A1	A2	A3
Global Warming Air, incl. Biogenic Carbon	[kg CO2-Equiv.]	24.4	0.631	23.2
Ozone Depletion Air	[kg CFC 11-Equiv.]	5.15e-09	2.67e-11	5.68e-11
Acidification	[kg SO2-Equiv.]	0.142	0.00308	0.0313
Eutrophication	[kg N-Equiv.]	0.00856	0.000199	0.00173
Smog Air	[kg O3-Equiv.]	2.54	0.0967	0.945
Abiotic Depletion for Fossil Resources	[MJ surplus energy]	MND*	MND*	MND*

### Results of the LCA – Environmental Impact, CML

PARAMETER	UNIT	A1	A2	A3
Global Warming Potential	[kg CO2-Equiv.]	24.9	0.636	23.2
Ozone Layer Depletion Potential	[kg R11-Equiv.]	3.78e-09	2.44e-11	5.18e-11
Acidification Potential	[kg SO2-Equiv.]	0.119	0.00229	0.0242
Eutrophication Potential	[kg Phosphate-Equiv.]	0.0134	0.000511	0.00502
Photochem. Ozone Creation Potential	[kg Ethene-Equiv.]	0.0154	0.000113	0.0018
Abiotic Depletion	[kg Sb-Equiv.]	MND*	MND*	MND*
Abiotic Depletion for Fossil Resources	[MJ surplus energy]	MND*	MND*	MND*

\*Module Not Disclosed: Insufficient data available to calculate this value

# An Environmental Product Declaration for Asphalt Mixtures

## References

- 1 ISO 14025:2006 Environmental labels and declarations - Type 3 environmental declarations - Principles and procedures
- 2 EN 15804-2012 Sustainability of Construction Works, Environmental Product Declarations, Core rules for the product category of construction products
- 3, 4, 5 Product Category Rules for Asphalt Mixtures, Version 1.0 dated 1/31/2017 Page 8, 10-12, 16-19

### DECLARED PRODUCT

12.5mm NRC, an asphalt mix for Dense Graded Superpave

### DECLARATION OWNER

Francis O.Day Company, Inc.  
David Jones  
(301) 518-5009  
davidj@foday.com

### PROGRAM OPERATOR



National Asphalt Pavement Association  
6406 Ivy Lane, Suite 350  
Greenbelt, MD 20770  
301-731-4748  
[www.AsphaltPavement.org/EPD](http://www.AsphaltPavement.org/EPD)

### LCA AND EPD TOOL DEVELOPER



Trisight  
906-370-4624  
[www.trisightengineering.com](http://www.trisightengineering.com)

### INDEPENDENT VERIFIERS



WAP Sustainability Consulting  
855-452-2522  
[www.wapsustainability.com](http://www.wapsustainability.com)

The data and declarations produced by the EPD tool was externally, independently verified in accordance with ISO14044, and ISO14025, and the referenced PCR.

### PRODUCT CATEGORY RULE

Product Category Rules for Asphalt Mixtures Version 1.0 dated 1/1/2017,  
[www.AsphaltPavement.org/PCR](http://www.AsphaltPavement.org/PCR)

### THE PCR REVIEW



PCR confirmed by PCR Review Panel  
Led by Joep Meijer  
The Right Environment Ltd. Co.  
512-821-1809  
[www.therightenvironment.net](http://www.therightenvironment.net)



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This asphalt mixture is categorized as a hot mix. This asphalt mixture was produced within a temperature range of 280.0 to 320.0 °F.



**Declaration Number:** 33.91.179 v3 **Emerald EcoLabel Version:** 1.1.3

**Date of Issue:** Feb 24, 2021

**Period of Validity:** Jan 31, 2022

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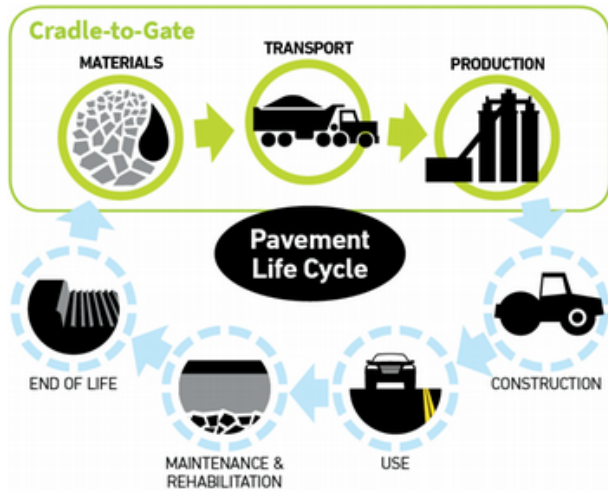
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# An Environmental Product Declaration for Asphalt Mixtures

## Life Cycle Assessment

### DECLARED UNIT

The declared unit is 1 short ton of an asphalt mixture (UNSPSC Code 30111509: Asphalt Based Concrete) as defined as “a plant-produced composite material of aggregates, asphalt binder, and other materials.”<sup>3</sup>



The three green icons represent the cradle-to-gate data used to create the Emerald Eco-Label Environmental Product Declaration (EPD) for asphalt pavement mixtures.

### LIFE CYCLE PHASES

This EPD covers the raw material supply, transport, and production life cycle phases (A1-A3). It does not include construction (placement and compaction), use, maintenance, rehabilitation, or the end-of-life life cycle phases (phases A4, A5, B1-7, and C1-4).<sup>4</sup>

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**Production (A3):** This stage comprises all plant operations involved in the production of asphalt mixtures. Data for this stage is plant-specific.

### LIFE CYCLE INVENTORY

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### ADDITIONAL ENVIRONMENTAL INFORMATION

None

### DECLARATION OF LIMITATIONS

This EPD reports the results of a cradle-to-gate LCA for asphalt mixtures. This EPD may be used as a data input for full life cycle assessments to compare the environmental impacts of different asphalt roadway, parking lot, or recreational pavement design alternatives.

### DATA GAPS

None

# An Environmental Product Declaration for Asphalt Mixtures

## Results of the LCA – Resource Use

PARAMETER	UNIT	A1	A2	A3
PERE	MJ, net calorific value	0.798	0	0.421
PERM	MJ, net calorific value	0	0	0
PERT	MJ, net calorific value	0.798	0	0.421
PENRE	MJ, net calorific value	4.2	299	414
PENRM	MJ, net calorific value	1.9e+03	0	0
PENRT	MJ, net calorific value	1.9e+03	299	414
SM	Kg	181	0	0
RSF	MJ, net calorific value	0	0	0
NRSF	MJ, net calorific value	0	0	0.0782
FW	M3	0	0	1.69e-08

PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PENRM	Use of non renewable primary energy resources used as raw materials
PERM	Use of renewable primary energy resources used as raw materials	PENRT	Total use of non renewable primary energy resources (primary energy and primary energy resources used as raw materials)
PERT	Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	SM	Use of secondary materials
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		NRSF	Use of non renewable secondary fuels
		FW	Net use of fresh water

## Results of the LCA – Output Flows and Waste Categories

PARAMETER	UNIT	A1	A2	A3
HWD	Kg	MND*	MND*	0
NHWD	Kg	MND*	MND*	0
RWD	Kg	MND*	MND*	0
CRU	Kg	0	0	0
MFR	Kg	0	0	0
MET	Kg	0	0	0
EEE	MJ, net calorific value	0	0	0
EET	MJ, net calorific value	0	0	0

HWD	Disposed-of hazardous waste	MFR	Materials for recycling
NHWD	Disposed-of non-hazardous waste	MET	Materials for energy recovery
RWD	Disposed-of radioactive waste	EEE	Exported electrical energy
CRU	Components for reuse	EET	Exported thermal energy

\*Module Not Disclosed: Insufficient data available to calculate this value



## An Environmental Product Declaration for Asphalt Mixtures

### Results of the LCA – Environmental Impact, TRACI

PARAMETER	UNIT	A1	A2	A3
Global Warming Air, incl. Biogenic Carbon	[kg CO2-Equiv.]	20.2	3.07	23.2
Ozone Depletion Air	[kg CFC 11-Equiv.]	4.24e-09	1.3e-10	5.68e-11
Acidification	[kg SO2-Equiv.]	0.119	0.015	0.0313
Eutrophication	[kg N-Equiv.]	0.00718	0.000968	0.00173
Smog Air	[kg O3-Equiv.]	2.15	0.47	0.945
Abiotic Depletion for Fossil Resources	[MJ surplus energy]	MND*	MND*	MND*

### Results of the LCA – Environmental Impact, CML

PARAMETER	UNIT	A1	A2	A3
Global Warming Potential	[kg CO2-Equiv.]	20.7	3.09	23.2
Ozone Layer Depletion Potential	[kg R11-Equiv.]	3.13e-09	1.18e-10	5.18e-11
Acidification Potential	[kg SO2-Equiv.]	0.0992	0.0111	0.0242
Eutrophication Potential	[kg Phosphate-Equiv.]	0.0114	0.00248	0.00502
Photochem. Ozone Creation Potential	[kg Ethene-Equiv.]	0.0127	0.00055	0.0018
Abiotic Depletion	[kg Sb-Equiv.]	MND*	MND*	MND*
Abiotic Depletion for Fossil Resources	[MJ surplus energy]	MND*	MND*	MND*

\*Module Not Disclosed: Insufficient data available to calculate this value

# An Environmental Product Declaration for Asphalt Mixtures

## References

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### DECLARED PRODUCT

12.5mm LRC, an asphalt mix for Dense Graded Superpave

### DECLARATION OWNER

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David Jones  
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This asphalt mixture is categorized as a hot mix. This asphalt mixture was produced within a temperature range of 280.0 to 320.0 °F.



**Declaration Number:** 33.91.181 v2 **Emerald EcoLabel Version:** 1.1.3

**Date of Issue:** Feb 24, 2021

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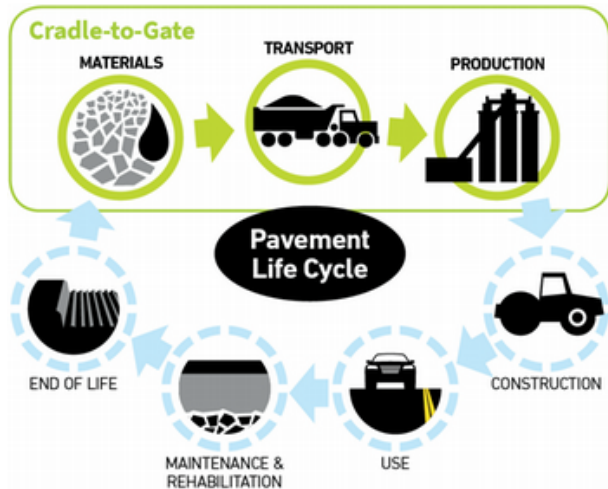
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### DATA GAPS

None

## An Environmental Product Declaration for Asphalt Mixtures

### Results of the LCA – Resource Use

PARAMETER	UNIT	A1	A2	A3
PERE	MJ, net calorific value	0.538	0	0.421
PERM	MJ, net calorific value	0	0	0
PERT	MJ, net calorific value	0.538	0	0.421
PENRE	MJ, net calorific value	2.83	579	414
PENRM	MJ, net calorific value	1.75e+03	0	0
PENRT	MJ, net calorific value	1.75e+03	579	414
SM	Kg	408	0	0
RSF	MJ, net calorific value	0	0	0
NRSF	MJ, net calorific value	0	0	0.0782
FW	M3	0	0	1.69e-08

PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PENRM	Use of non renewable primary energy resources used as raw materials
PERM	Use of renewable primary energy resources used as raw materials	PENRT	Total use of non renewable primary energy resources (primary energy and primary energy resources used as raw materials)
PERT	Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	SM	Use of secondary materials
PENRE	Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials	RSF	Use of renewable secondary fuels
		NRSF	Use of non renewable secondary fuels
		FW	Net use of fresh water

### Results of the LCA – Output Flows and Waste Categories

PARAMETER	UNIT	A1	A2	A3
HWD	Kg	MND*	MND*	0
NHWD	Kg	MND*	MND*	0
RWD	Kg	MND*	MND*	0
CRU	Kg	0	0	0
MFR	Kg	0	0	0
MET	Kg	0	0	0
EEE	MJ, net calorific value	0	0	0
EET	MJ, net calorific value	0	0	0

HWD	Disposed-of hazardous waste	MFR	Materials for recycling
NHWD	Disposed-of non-hazardous waste	MET	Materials for energy recovery
RWD	Disposed-of radioactive waste	EEE	Exported electrical energy
CRU	Components for reuse	EET	Exported thermal energy

\*Module Not Disclosed: Insufficient data available to calculate this value

## An Environmental Product Declaration for Asphalt Mixtures

### Results of the LCA – Environmental Impact, TRACI

PARAMETER	UNIT	A1	A2	A3
Global Warming Air, incl. Biogenic Carbon	[kg CO2-Equiv.]	13.4	5.94	23.2
Ozone Depletion Air	[kg CFC 11-Equiv.]	2.78e-09	2.51e-10	5.68e-11
Acidification	[kg SO2-Equiv.]	0.0802	0.029	0.0313
Eutrophication	[kg N-Equiv.]	0.00483	0.00187	0.00173
Smog Air	[kg O3-Equiv.]	1.49	0.911	0.945
Abiotic Depletion for Fossil Resources	[MJ surplus energy]	MND*	MND*	MND*

### Results of the LCA – Environmental Impact, CML

PARAMETER	UNIT	A1	A2	A3
Global Warming Potential	[kg CO2-Equiv.]	13.7	5.98	23.2
Ozone Layer Depletion Potential	[kg R11-Equiv.]	2.03e-09	2.29e-10	5.18e-11
Acidification Potential	[kg SO2-Equiv.]	0.0668	0.0215	0.0242
Eutrophication Potential	[kg Phosphate-Equiv.]	0.00787	0.00481	0.00502
Photochem. Ozone Creation Potential	[kg Ethene-Equiv.]	0.00833	0.00106	0.0018
Abiotic Depletion	[kg Sb-Equiv.]	MND*	MND*	MND*
Abiotic Depletion for Fossil Resources	[MJ surplus energy]	MND*	MND*	MND*

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The data and declarations produced by the EPD tool was externally, independently verified in accordance with ISO14044, and ISO14025, and the referenced PCR.

### PRODUCT CATEGORY RULE

Product Category Rules for Asphalt Mixtures Version 1.0 dated 1/1/2017,  
[www.AsphaltPavement.org/PCR](http://www.AsphaltPavement.org/PCR)

### THE PCR REVIEW



PCR confirmed by PCR Review Panel  
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