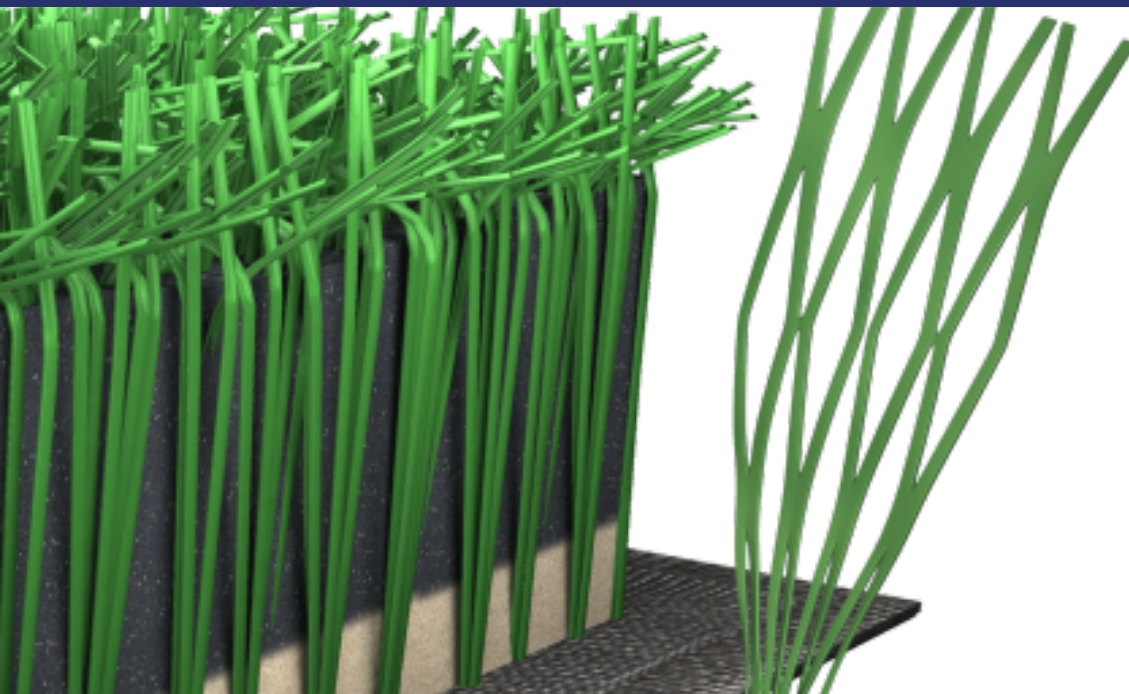


ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025 AND ISO 21930:2017, OPT. EN 15804+A2

SmartEPD-2024-035-0165-01

FieldTurf Tarkett USA Artificial Turf Products 2024



Date of Issue:
Sep 23, 2024

Expiration:
Sep 23, 2029

Last updated:
Sep 25, 2024



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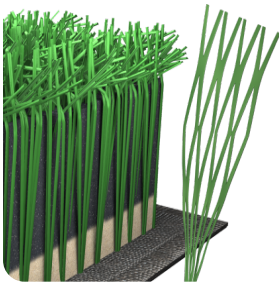
General Information

FieldTurf

FieldTurf USA 175 N Industrial Blvd NE Calhoun, Georgia 30701

1-800-724-2969

service@fieldturf.com fieldturf.com



Product Name:	FieldTurf Tarkett USA Artificial Turf Products 2024
Declared Unit:	1 m2
Declaration Number:	SmartEPD-2024-035-0165-01
Date of Issue:	September 23, 2024
Expiration:	September 23, 2029
Last updated:	September 25, 2024
EPD Scope:	Cradle to gate A1 - A3
Market(s) of Applicability:	North America

Reference Standards

Standard(s):	ISO 14025 and ISO 21930:2017, opt. EN 15804+A2
Core PCR:	Smart EPD® Part A Product Category Rules for Building and Construction Products and Services v.1.01 Date of issue: January 15, 2024 Valid until: January 15, 2029
Sub-category PCR review panel:	Contact Smart EPD for more information.
General Program Instructions:	Smart EPD General Program Instructions v.1.0, November 2022

Verification Information

ACLCA PCR Guidance Version:	1.0
ACLCA PCR Conformance Level:	Transparency
LCA Author/Creator:	Brian Bunte Brian Bunte sustainability@nextgenesg.co
EPD Program Operator:	Smart EPD info@smartepd.com www.smartepd.com 585 Grove St., Ste. 145 PMB 966, Herndon, VA 20170, USA

Verification:

Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071 :

External

 Rifat Karim |  Independent Consultant |  rifat.chimique@gmail.com

Independent external verification of EPD, according to ISO 14025 and reference PCR(s) :

External

 Rifat Karim |  Independent Consultant |  rifat.chimique@gmail.com

Limitations, Liability, and Ownership

This EPD is created by FieldTurf Tarkett, before being registered in the SmartEPD Database. The Life Cycle Inventory is created with SimaPro software, and generic data is sourced from the Ecoinvent database. This EPD is intended both for business-to-business (B2B) and business-to-consumer (B2C) communication.

The following additional limitations and disclaimers must also be considered while reviewing this report and its findings:

- Environmental declarations from different programs (ISO 14025) may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the whole building life cycle. EPD comparability is only possible when all stages of a life cycle have been considered. However, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared. The EPD owner has sole ownership, liability, and responsibility for the EPD.
- Life Cycle Impact Assessment (LCIA) results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.
- The environmental impact results of products in this document are based on a declared unit and therefore do not provide sufficient information to establish comparisons. The results shall not be used for comparisons without knowledge of how the physical properties of the product impact the precise function at the construction level. The environmental impact results shall be converted to a functional unit basis before any comparison is attempted.
- A manufacturer shall not make claims based on an industry-average EPD which leads the market to believe the industry-average is representative of manufacturer-specific or product-specific results.

Organization Information

FieldTurf produces artificial turf playing surfaces. Turf is manufactured and installed by FieldTurf Tarkett, a division of French company Tarkett. FieldTurf is headquartered in Montreal, Quebec, Canada, and its primary manufacturing facility is located in Calhoun, Georgia, United States.

Further information can be found at: <https://fieldturf.com/en/>

Product Description

This report contains the analysis of 18 artificial turf products reflecting the average production conditions for 1 m² of each FieldTurf products. Given all 18 products are made at the same production facility and from the same set of raw materials, the 18 products have been organized into 4 Groups to facilitate reporting. The products included and their groupings are displayed below:

Group 1: Products with weights ranging from 1.93 to 2.07 kg/m²

- FieldTurf Prestige XT
- FieldTurf Classic HD
- FieldTurf CORE
- FieldTurf Revolution 360
- FieldTurf Prestige XM

Group 2: Products with weights ranging from 2.29 to 2.39 kg/m²

- FieldTurf Prestige Vertex

- FieldTurf Vertex Prime
- FieldTurf Vertex CORE
- FieldTurf LSCP-ET
- FieldTurf LSCP-TD

Group 3: Products with weights ranging from 2.78 to 3.05 kg/m2

- FieldTurf Vintage Series
- FieldTurf LSCP-FL
- FieldTurf Vintage Blend
- FieldTurf LSCP
- FieldTurf Hockey Gold
- FieldTurf Hockey Multi

Group 4: Products with weights ranging from 3.39 to 3.41 kg/m2

- FieldTurf EASYFIELD
- FieldTurf FIT

Further information can be found at: <https://fieldturf.com/en/products/detail/turf-systems/>

Product Information

Declared Unit:	1 m2
Mass:	2.3 kg
Reference Service Life:	8 Years
Product Specificity:	✓ Product Average ✗ Product Specific

Averaging:

This average EPD was created in accordance to methods described in SmartEPD Part A Product Category Rules for Building and Construction Products and Services v1.01. For each indicator, we declare the average results of the included products. This average is weighted according to the production volumes of the included products.

To conduct this averaging, the 18 FieldTurf products were organized into four groups based on their mass per m2 which is reflective of their fiber densities.

The GWP Variation in modules A1 - A3 for each group compared with the group average is shown below:

- Group 1 - 96% - 103%
- Group 2 - 98% - 102%
- Group 3 - 98% - 103%
- Group 4 - 99% - 100%

Plants

- 

FieldTurf USA Production Plant
175 N Industrial Blvd NE, Calhoun, GA, USA
- 

FieldTurf USA Production Plant
175 N Industrial Blvd NE, Calhoun, GA, USA

Product Specifications

Product Classification Codes: UNSPSC - 30121803

Material Composition

Material/Component Category	Origin	% Mass
Yarn or Fiber	Germany, UAE, and USA	59.1
Primary Backing	UAE, India, and USA	4.2
Secondary Backing	USA	24.8
Shock Pads	USA and Canada	11.8

Packaging Material	Origin	kg Mass
PP Tape	USA	0.00022
LLDPE Wrap	USA	0.00319
PP Bags	USA	0.00234
Cardboard	USA	0.0831

Biogenic Carbon Content	kg C per m2
Biogenic carbon content in product	None
Biogenic carbon content in accompanying packaging	0.084

Hazardous Materials
No regulated hazardous or dangerous substances are included in this product.

EPD Data Specificity

Primary Data Year:	2023
Manufacturing Specificity:	✗ Industry Average ✗ Manufacturer Average ✓ Facility Specific

Software and LCI Data Sources

LCA Software:	📖 SimaPro v. 9.6
LCI Foreground Database(s):	📖 Ecoinvent v. 3.10 📍 US-SERC 📄 cut-off 📖 Ecoinvent v. 3.10 📍 AE 📄 cut-off 📖 Ecoinvent v. 3.10 📍 DE 📄 cut-off
LCI Background Database(s):	📖 Ecoinvent v. 3.10 📍 RoW 📄 cut-off 📖 Ecoinvent v. 3.10 📍 GLO 📄 cut-off

Renewable Electricity

Renewable electricity is used:	Yes
Electricity Source:	Offsite
Renewable type:	Hydropower
Percent of EPD Owner's product-related electricity covered:	100 %
Grid type used to model remaining electricity:	NA, 100% coverage
Commitment pledged for entire EPD validity period:	No

System Boundary

Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	ND
	A5	Assembly / Install	ND
Use	B1	Use	ND
	B2	Maintenance	ND
	B3	Repair	ND
	B4	Replacement	ND
	B5	Refurbishment	ND
	B6	Operational Energy Use	ND
	B7	Operational Water Use	ND
End of Life	C1	Deconstruction	ND
	C2	Transport	ND
	C3	Waste Processing	ND
	C4	Disposal	ND
Benefits & Loads Beyond System Boundary	D	Recycling, Reuse Recovery Potential	ND

Product Flow Diagram



Life Cycle Module Descriptions

The production has been modelled on data supplied by the manufacturer for its factory in Calhoun, Georgia. All factory data are measured in square meters, and it is assumed that the process consumptions are governed by area of flooring processed rather than mass (manufacturer's usual method of calculation). These quantities have been calculated by dividing the annual consumption per the quantity of m² produced in a year.

All modules related to the cradle-to-gate boundary are included (modules A1 – A3). Downstream modules are excluded as they fall outside of the cradle-to-gate boundary and because downstream processes may vary significantly among FieldTurf customers.

Primary data are collected from the calendar year 2023. The analysis is conducted using SimaPro v9.6 using ecoinvent 3.10 for background data. Information on the cut-off approach and allocation used in this analysis can be found in those respective sections earlier in the report. Information on the background data selected from ecoinvent, including the dataset geography and other information, can be found in the tables above. Secondary datasets that are selected are done so with sufficient detail and considered sufficiently complete in order to conduct this life cycle assessment.

Capital goods and infrastructure are assumed to contribute minimally to impacts throughout the product life cycle, hence they are excluded from the LCA unless captured within secondary data from ecoinvent. It is assumed that the exclusion of some capital goods and infrastructure are immaterial to overall results. With the exception of the aforementioned, no flows or processes are deliberately excluded from the study.

In 2023, Morton Extrusionstechnik (MET) uses only renewable electricity in the manufacturing of 1kg of Polyethylene fibers. The Green Electricity Tariff providing MET with 100% renewable electricity will be expiring in December 2025. Given the EPD validity period extends until 2029, FieldTurf will need to update energy information in this LCA to maintain the validity of this LCA and associated EPD if the same contract is not renewed after 2025 and for the duration of the EPD's validity period.

LCA Discussion

Allocation Procedure

All data regarding inputs and outputs provided by FieldTurf are facility-wide for the factory in Calhoun, Georgia. Therefore, all inputs and outputs are allocated. Allocation is conducted based on the mass of each final product per m². This allocation approach is used to ensure that the inputs, outputs, and the resulting environmental impacts are proportionally distributed according to the relative mass contribution of each product.

Cut-off Procedure

The cut-off criteria used for this study is as follows:

- All inputs and outputs to a (unit) process are included in the calculation where the data is available.
- A maximum of 1% of the total mass per unit process may be omitted.
- A maximum of 1% of the total renewable and non-renewable energy for a unit process may be omitted.
- A maximum of 5% of the total energy usage and mass per module may be omitted.

All input and output flows have been considered, including raw materials as per the product composition provided by the manufacturer and packaging of raw materials as well as the final product. Energy and water consumptions have also been considered at 100% according to the data provided. No flows or processes were deliberately excluded from the study.

Modules A1-A3

All input and output flows have been considered.

Data Quality Discussion

Primary data are collected from the calendar year 2023. The analysis is conducted using SimaPro v9.6 using ecoinvent 3.10 for background data. Information on the cut-off approach and allocation used in this analysis can be found in those sections report, respectively. Information on the background data selected from ecoinvent, including the dataset geography and other information, can be found in the tables above.

- Temporal – LCI data are supplied by:
 - Where available, data is collected specifically for this study at Tarkett production site. These data correspond to production during the year 2023.
 - In the absence of specific data, generic data from the Ecoinvent database 3.10 (Cut-off by classification). This database is updated annually and was last updated in November 2023. Therefore, the age of generic data is less than 10 years.
- Landfill datasets selected in ecoinvent consider a 100-year scenario
- Geographical:
 - Specific data come from the manufacturer's production site located in Calhoun, Georgia.
 - Generic data from the Ecoinvent database representing United States processes are used where available, otherwise global data are used
- Technological – material shaping technology data are based on:
 - Technologies in use by the manufacturer for the production processes of their products
 - United States technologies in the case of generic data
- Completeness:
 - All relevant environmental impacts and life cycle stages are considered. No significant flows or processes have been omitted
 - Datasets that are selected are with sufficient detail and considered complete in order to conduct the life cycle assessment
- Reliability
 - All data used are considered reliable, as primary data are provided by the FieldTurf team at Calhoun and all secondary data are sourced from the most current version of the reputable ecoinvent database
- Consistency:
 - This analysis was conducted in alignment with the methodologies prescribed by SmartEPD Part A and includes consistent application of system boundaries, allocation rules, and impact assessment methods.

A pedigree matrix assessing data quality can be found in the accompanying LCA report.

Results

Environmental Impact Assessment Results

IPCC AR5 GWP 100, TRACI 2.1

per 1 m2 of product.

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Group 1: LCA Results for Products with weights ranging from 1.93 to 2.07 kg/m2

Impact Category	Method	Unit	A1A2A3
GWP-total	IPCC AR5 GWP 100	kg CO2 eq	7.64e+0
ODP	TRACI 2.1	kg CFC 11 eq	2.79e-7
EP	TRACI 2.1	kg N eq	2.10e-2
AP	TRACI 2.1	kg SO2 eq	2.70e-2
POCP	TRACI 2.1	kg O3 eq	3.81e-1
Abbreviations: GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particular Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.			

per 1 m2 of product.

Group 2: LCA Results for Products with weights ranging from 2.29 to 2.39 kg/m2

Impact Category	Method	Unit	A1A2A3
GWP-total	IPCC AR5 GWP 100	kg CO2 eq	8.89e+0
ODP	TRACI 2.1	kg CFC 11 eq	3.24e-7
EP	TRACI 2.1	kg N eq	2.44e-2
AP	TRACI 2.1	kg SO2 eq	3.13e-2
POCP	TRACI 2.1	kg O3 eq	4.43e-1
Abbreviations: GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particular Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.			

per 1 m2 of product.

Group 3: LCA Results for Products with weights ranging from 2.78 to 3.05 kg/m2

Impact Category	Method	Unit	A1A2A3
GWP-total	IPCC AR5 GWP 100	kg CO2 eq	1.09e+1
ODP	TRACI 2.1	kg CFC11 eq	3.96e-7
EP	TRACI 2.1	kg N eq	2.98e-2
AP	TRACI 2.1	kg SO2 eq	3.82e-2
POCP	TRACI 2.1	kg O3 eq	5.40e-1
Abbreviations: GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particular Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.			

per 1 m2 of product.

Group 4: LCA Results for Products with weights ranging from 3.39 to 3.41 kg/m2

Impact Category	Method	Unit	A1A2A3
GWP-total	IPCC AR5 GWP 100	kg CO2 eq	1.29e+1
ODP	TRACI 2.1	kg CFC11 eq	4.72e-7
EP	TRACI 2.1	kg N eq	3.55e-2
AP	TRACI 2.1	kg SO2 eq	4.56e-2
POCP	TRACI 2.1	kg O3 eq	6.44e-1

Abbreviations:
GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particular Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.

The results of impact assessment for each group are displayed in the tables above. Results are calculated using the TRACI 2.1 LCIA method, with the exception of GWP which is calculated using the IPCC 2013 GWP 100a V1.03 LCIA method. This approach is in compliance with section 7.3 of SmartEPD Part A Product Category Rules for Building and Construction Products and Services v1.0.

Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted. Any comparison of EPDs shall be subject to the requirements of ISO 21930 or EN 15804. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparison can be inaccurate, and could lead to erroneous selection of materials or products which are higher-impact, at least in some impact categories.

Resource Use Indicators

per 1 m2 of product.

Input and Output Flow Indicators for Group 1: Products with weights ranging from 1.93 to 2.07 kg/m2

Indicator	Unit	A1A2A3
RPRE	MJ, LHV	1.08e+2
RPRM	MJ, LHV	0
RPRT	MJ, LHV	1.08e+2
NRPRE	MJ, LHV	1.47e+0
NRPRM	MJ, LHV	9.12e+1
NRPRT	MJ, LHV	9.27e+1
SM	kg	5.39e-2
RSF	MJ, LHV	0
NRSF	MJ, LHV	0
RE	MJ, LHV	0
ADPF	MJ, LHV	1.61e+2
FW	m3	1.80e-5

Abbreviations:
RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRT or PENRT = Total non-renewable primary resources with energy content, SM: Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

per 1 m2 of product.

Input and Output Flow Indicators for Group 2: Products with weights ranging from 2.29 to 2.39 kg/m2

Indicator	Unit	A1A2A3
RPRE	MJ, LHV	1.26e+2
RPRM	MJ, LHV	0
RPRT	MJ, LHV	1.26e+2
NRPRE	MJ, LHV	1.71e+0
NRPRM	MJ, LHV	1.06e+2
NRPRT	MJ, LHV	1.08e+2
SM	kg	6.26e-2
RSF	MJ, LHV	0
NRSF	MJ, LHV	0
RE	MJ, LHV	0
ADPF	MJ, LHV	1.87e+2
FW	m3	2.10e-5

Abbreviations:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRT or PENRT = Total non-renewable primary resources with energy content, SM: Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

per 1 m2 of product.

Input and Output Flow Indicators for Group 3: Products with weights ranging from 2.78 to 3.05 kg/m2

Indicator	Unit	A1A2A3
RPRE	MJ, LHV	1.53e+2
RPRM	MJ, LHV	0
RPRT	MJ, LHV	1.53e+2
NRPRE	MJ, LHV	2.08e+0
NRPRM	MJ, LHV	1.29e+2
NRPRT	MJ, LHV	1.31e+2
SM	kg	7.64e-2
RSF	MJ, LHV	0
NRSF	MJ, LHV	0
RE	MJ, net calorific value	0
ADPF	MJ, LHV	2.28e+2
FW	m3	2.56e-5

Abbreviations:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRT or PENRT = Total non-renewable primary resources with energy content, SM: Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

per 1 m2 of product.

Input and Output Flow Indicators for Group 4: Products with weights ranging from 3.39 to 3.41 kg/m2

Indicator	Unit	A1A2A3
RPRE	MJ, LHV	1.83e+2
RPRM	MJ, LHV	0
RPRT	MJ, LHV	1.83e+2
NRPRE	MJ, LHV	2.48e+0
NRPRM	MJ, LHV	1.54e+2
NRPRT	MJ, LHV	1.57e+2
SM	kg	9.11e-2
RSF	MJ, LHV	0
NRSF	MJ, LHV	0
RE	MJ, LHV	0
ADPF	MJ, LHV	2.72e+2
FW	m3	3.05e-5

Abbreviations:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRT or PENRT = Total non-renewable primary resources with energy content, SM: Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

Input and Output Flow Indicators representing resource use results for each group are displayed in the tables above.

Waste and Output Flow Indicators

per 1 m2 of product.

Waste Flow Indicators for Group 1: Products with weights ranging from 1.93 to 2.07 kg/m2

Indicator	Unit	A1A2A3
HWD	kg	0
NHWD	kg	1.25e-2
HLRW	kg	0
ILLRW	kg	0
CRU	kg	0
MFR	kg	1.45e-1
MER	kg	0
EE	MJ, LHV	0

Abbreviations:

HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.

per 1 m2 of product.

Waste Flow Indicators for Group 2: Products with weights ranging from 2.29 to 2.39 kg/m2

Indicator	Unit	A1A2A3
HWD	kg	0
NHWD	kg	1.45e-2
HLRW	kg	0
ILLRW	kg	0
CRU	kg	0
MFR	kg	1.69e-1
MER	kg	0
EE	MJ, LHV	0
Abbreviations: HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.		

per 1 m2 of product.

Waste Flow Indicators for Group 3: Products with weights ranging from 2.78 to 3.05 kg/m2

Indicator	Unit	A1A2A3
HWD	kg	0
NHWD	kg	1.77e-2
HLRW	kg	0
ILLRW	kg	0
CRU	kg	0
MFR	kg	2.06e-1
MER	kg	0
EE	MJ	0
Abbreviations: HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.		

per 1 m2 of product.

Waste Flow Indicators for Group 4: Products with weights ranging from 3.39 to 3.41 kg/m2

Indicator	Unit	A1A2A3
HWD	kg	0
NHWD	kg	2.11e-2
HLRW	kg	0
ILLRW	kg	0
CRU	kg	0
MFR	kg	2.45e-1
MER	kg	0
EE	MJ	0
Abbreviations: HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.		

The Waste Flow Indicators for each group are displayed in the tables above.

Carbon Emissions and Removals

per 1 m2 of product.

Biogenic Carbon Uptake and Emissions for All 4 Product Groups

Indicator	Unit	A1A2A3
BCRP	kg CO2	0
BCEP	kg CO2	0
BCRK	kg CO2	0
BCEK	kg CO2	0
BCEW	kg CO2	0
CCE	kg CO2	0
CCR	kg CO2	0
CWNR	kg CO2	0
Abbreviations: BCRP = Biogenic Carbon Removal from Product, BCEP = Biogenic Carbon Emission from Product, BCRK = Biogenic Carbon Removal from Packaging, BCEK = Biogenic Carbon Emission from Packaging, BCEW = Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes, CCE = Calcination Carbon Emissions, CCR = Carbonation Carbon Removals, CWNR = Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes, GWP-luc = Carbon Emissions from Land-use Change.		

Biogenic carbon uptake and emissions are reported in the table above. Note that this single set of results applies to all product groups given products are packaged the same. Note that there is no biogenic carbon content in products and the biogenic carbon content in packaging is negligible.

Interpretation

Impacts of FieldTurf's artificial turf products are driven primarily by production in the A1 module. Inputs in A1 dominate impacts across all LCIA categories with impact contributions ranging from at least 71% up to 94%. Impacts of A1 inputs significantly exceed the impacts of inputs from A2 and A3, which have insignificant to moderate contribution to impacts across impact categories. A2 and A3 inputs contribute from 3% - 25% and 2% - 8%, respectively. A1 inputs contribute over twice as much (2x) to impacts across all impact categories than A2 inputs and A3 inputs. Therefore, we conclude that A1 inputs are the most significant as they contribute far more to LCIA results across all categories than other stages. The bullets below provide additional detail as to which inputs are contributing the most to impacts associated with A1 inputs.

Relative Contributions to A1 Impacts:

- Fiber
- Min. Contribution: 48%, Max Contribution: 73%
- Primary Backing
- Min. Contribution: 4%, Max Contribution: 8%
- Secondary Backing
- Min Contribution: 13%, Max Contribution: 35%
- Shockpads
- Min Contribution: 7%, Max Contribution: 11%

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