

ENVIRONMENTAL PRODUCT DECLARATION

INDOOR RUBBER ATHLETIC FLOORING 6 mm THICKNESS (ADVANCE NEW GENERATION, MONDOARMOR, RAMFLEX, SPORT IMPACT, ZONE-IT)

MONDO SPORT&FLOORING



Resilient Rubber sport flooring for multisport facilities.



SAFE FOR ATHLETES, SAFE FOR THE ENVIRONMENT.

We design, manufacture and supply sports solutions that are safe for the athletes who use them each day, and the structures and environment where they are installed. Our commitment starts with how we design our products, and it continues in how we select our raw materials, choose the energy sources that power our plants, all the way through to how our flooring is disposed of or recycled.

Because indoor air pollution can have a negative effect on athletes' performance and put their health at risk, MONDO has been providing low-emitting products for years, all certified by independent external laboratories, such as UL Environment.

By publishing this EPD, we are demonstrating our commitment to better processes, products and performance for a reduced environmental impact.



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EN 15804 and ISO 21930:2017

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL Environment 333 Pfingsten Road, Northbrook, IL 60611	https://www.ul.com/ https://spot.ul.com
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	General Program Instructions v.2.1 July 2017	
MANUFACTURER NAME AND ADDRESS	MONDO SpA Piazzale E. Stroppiana, 1 12051 Alba, Fraz. Gallo. ITALY	
DECLARATION NUMBER	4789077920.102.1	
DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT	Average product (6 mm) - Cover 1 m ² of floor with sport floorings, a reference life service of 20 years for specified characteristics application and use areas according EN1817 ¹ .	
REFERENCE PCR AND VERSION NUMBER	PCR - Part A: <i>Life Cycle Assessment Calculation Rules and Report Requirements</i> , Version 3.2. Dated September 2018, UL Environment 10010. PCR - Part B: <i>Flooring EPD Requirements</i> . Second Edition. Dated September 28, 2018, UL Environment 10010-7, Institut Bauen und Umwelt e.V.	
DESCRIPTION OF PRODUCT APPLICATION/USE	Product family of resilient athletic flooring is classified in accordance with ISO 10874 and in reference to the FCSS.	
PRODUCT RSL DESCRIPTION (IF APPL.)	The stated RSL is 20 years. The manufacturer has provided this service life on the basis of his experience of flooring manufacture and supply.	
MARKETS OF APPLICABILITY	North America/Europe/Global	
DATE OF ISSUE	July 1, 2020	
PERIOD OF VALIDITY	5 years	
EPD TYPE	Product-specific	
RANGE OF DATASET VARIABILITY	[Industry-average only; mean. median. standard deviation]	
EPD SCOPE	[Cradle to grave]	
YEAR(S) OF REPORTED PRIMARY DATA	2018	
LCA SOFTWARE & VERSION NUMBER	Simapro 9	
LCI DATABASE(S) & VERSION NUMBER	Ecoinvent 3.5	
LCIA METHODOLOGY & VERSION NUMBER	Methode EN 15804_FR_Ev-DEC 1.17_ei3.4_US_Mondo V1.17	

The PCR review was conducted by:

UL Environment
PCR Review Panel
epd@ulenvironment.com

This declaration was independently verified in accordance with ISO 14025: 2006.
 INTERNAL EXTERNAL

María José Monteagudo Arrebola

This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:

Thomas P. Gloria, Industrial Ecology Consultants

¹ Resilient floor coverings - Specification for homogeneous and heterogeneous smooth rubber floor coverings - https://standards.cen.eu/dyn/www/f?p=204:110:0:::FSP_PROJECT_FSP_ORG_ID:31961.6116&cs=1D40144E6FD5DE6DA6FFE0575A2F85483

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LIMITATIONS

Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc.

Accuracy of Results: EPDs regularly rely on estimations of impacts; the level of accuracy in estimation of effect differs for any particular product line and reported impact.

Comparability: EPDs from different programs may not be comparable. Full conformance with a PCR allows EPD comparability only 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.



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1. Product Definition and Information

1.1. Description of Company/Organization

MONDO was founded in Alba, Italy, in 1948 as a manufacturer of balls for fistball. Today, MONDO is an international group with nine manufacturing plants in Italy, Spain, Luxembourg, and China, and sales subsidiaries in Europe, North America, and Asia.

Mondo Sport&Flooring is the sports flooring and equipment division of the Group, leading manufacturer and supplier of rubber sports flooring for a variety of different sports and facilities.

MONDO sport surfaces are manufactured in Italy and in Luxembourg plants, both complying with the ISO 9001 Quality Management System and ISO14001 Environmental Management System.

1.2. Product Description

Product Identification

Product designation: MONDOARMOR, SPORT IMPACT, ZONE-IT, RAMFLEX, ADVANCE NEW GENERATION

This environmental product declaration covers five products produced by Mondo with a thickness of 6 mm: MondoArmor, Sport Impact, Zone-It, Ramflex and Advance New Generation. These products are rubber floorings used in the sporting field.

Product Specification

The product family has technical specifications compliant with the standard *EN 1817 – Resilient Floor Coverings: Specification for homogenous and heterogenous smooth rubber floor coverings* with for example a hardness ≥ 75 shore A (Test method from ISO 7619-1).

The product family also possesses characteristics compliant with the standard *EN 14041 – Resilient, textile, laminate and modular multi-layer floor coverings - Essential characteristics* with, for example a dynamic coefficient of friction ≥ 0.3 (Test method from EN 13839).

The physical characteristics are available in table 1.

Product Specific EPD

Five products are grouped together and presented in this EPD. These five products have a similar composition and a same thickness of 6 mm. The environmental impacts of each were compared and the products were considered homogeneous, with results complying the rules defined in PCR Part A. Therefore, impacts declaration is based on an average product of 6 mm. The average product is formed by every element of LCI based on an arithmetic mean.

1.3. Application

MONDO Advance New Generation is designed for indoor applications in multipurpose areas for fitness, futsal, basketball, volleyball, etc. Zone-It and MondoArmor are designed for indoor fitness, Sport Impact and Ramflex are designed for indoor applications in weight rooms and ice arenas.





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1.4. Declaration of Methodological Framework

For this project, a Cradle-to-Grave LCA approach has been applied, using a functional unit as reference. Specific data and background systems have been modelled with generic data from the ecoinvent 3.5 database. No known flows have been deliberately omitted from the calculation, except for the transport of packaging of raw and secondary materials and emissions to air.

The Reference Service Life and technical and functional performances described in this EPD are applicable as long as the product use complies with that defined by ISO 10874 and EN 1817 in accordance with the product’s classification.

Information concerning the LCA rules including cut-off and allocation rules applied to this study may be found in Chapter 2.

1.5. Technical Requirements

Technical requirements for the declared and average product are specified in the following table:

Characteristic	Nominal Value	Unit	Test Methods
Product Thickness	6.00	mm	ISO 24346
Product Weight	8.38	kg/m ²	ISO 23997
Density	1395.8	kg/m ³	ISO 23996
Rolls - Width	185.25	cm	ISO 24341
Rolls - Length	12.75	m	ISO 24341
Tiles	91.35 x 91.35	cm	ISO 24342
Type of Manufacture	Vulcanization	-	-
Abrasion Resistance	≤ 250	mm ³	ISO 4649 (Met. A-5N)

Table 1: Declared product characteristics

1.6. Properties of Declared Product as Delivered

Product family of resilient athletic flooring is classified in accordance with ISO 10874 (previously EN 685) and in reference to the FCSS (Floor Covering Standard Symbols).





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1.7. **Material Composition**

The product range consists of vulcanized rubber flooring.

Component	Material	Mass %	Availability
Binder	High Styrene-Butadiene Copolymer	27.2	Non-Renewable - <i>Limited</i>
Filler	Calcium Carbonate	0.42	Abundant Mineral
Reinforcement	Kaolin and Clay	33.64	Abundant Mineral
	Silica and Silicon		Abundant Mineral
Additives	Various	22.61	-
Pigments	Titanium Dioxide	0.83	Non-Renewable - <i>Limited</i>
Granules	Post-consumer	15.3	Recycling scrap

Table 2: Declared product Composition

High Styrene Butadiene Copolymer – an industrial polymerisation process of the monomers styrene and butadiene.

Calcium Carbonate – obtained by quarrying abundant minerals such as limestone or chalk.

Kaolin and Clay – obtained by quarrying the abundant mineral kaolinite.

Silica and Silicon – an abundant mineral obtained by quarrying.

Titanium Dioxide – a white pigment produced by an industrial chemical processing of rutile, a naturally occurring ore.

Granules – secondary material either from an existing manufactured product.



1.8. Manufacturing

Ramflex and Advance New Generation are made in the Mondo manufacturing plant in Foetz, Luxembourg while MondoArmor, Sport Impact and Zone-IT are made in the Italian Mondo manufacturing plant in Alba. Nevertheless, the products are manufactured in the same way.

The production of the declared floor covering is divided into the following stages:

1. Mixing: The raw materials are blended to achieve the desired formulation, each surface has its own composition.
2. Calendering: Each mixture is then calendered to the required thickness.
3. Co-Vulcanization: The two different layers of solid rubber are vulcanized together to form a continuous surface.
4. Trimming: Once finished, the product is inspected and then cut to the desired dimensions
5. Packaging: The final product is rolled onto cardboard inner tubes before being packed on wooden pallets ready for shipping.

Some production losses have been identified; they are totally re-injected into production.

Manufacturing waste is recycled in production whenever possible, residual wastes are sent to landfill.

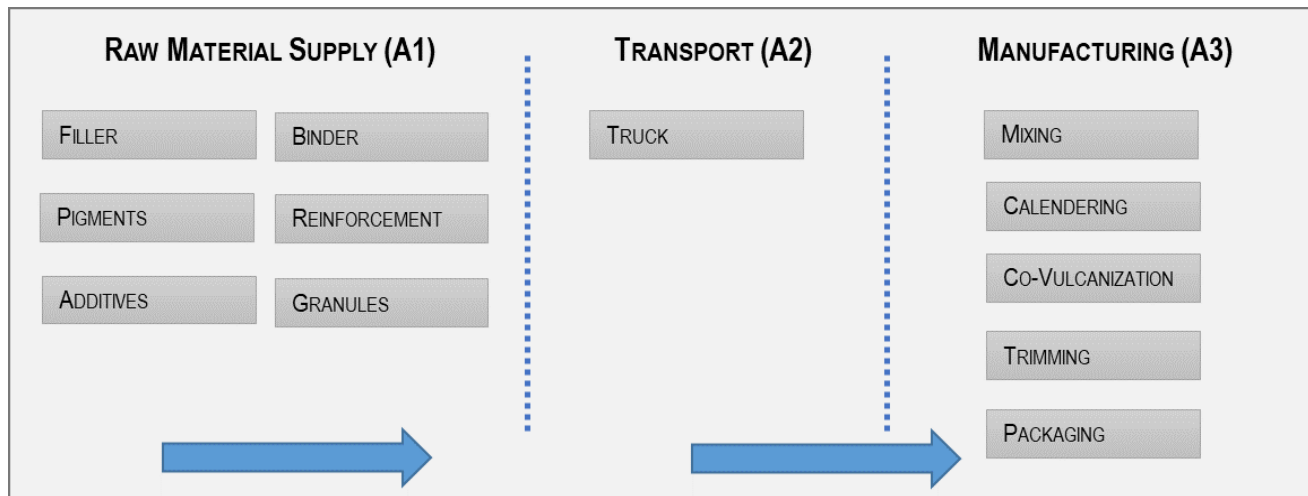


Figure 1: Flow diagram – manufacturing process

1.9. Packaging

The final product is rolled onto cardboard inner tubes before being packed on wooden pallets ready for shipping. Some papers, plastics, rubber, wood and polyurethane foam can be used to consolidate packaging.

Biogenic carbon providing by cardboard, paper and wood packaging has been considered in this EPD.

The packaging waste scenario for paper, wood and cardboard in US is 75% recycling, 20% landfilling and 5% incineration as describe in ULE Part A Requirements, according to RCRA for North American region. For plastics and rubber, the packaging waste scenario in US, according to RCRA for North American region, is 15% recycling, 68% landfilling and 17% incineration.



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1.10. Transportation

MondoArmor, Ramflex and Advance New Generation are sold in Canada and Italy while Sport Impact is sold in Canada, Luxembourg and Russia and Zone-It in Canada and Sweden.

The delivery distance of the declared product is an average of the delivery distances of the five products covered in this EPD, weighted by their percentages of sales.

Transport Distance 16-32T Truck:	548 km
Transport Distance Transoceanic Freight:	4273 km

1.11. Product Installation

The range of products is installed by hand using adhesive and a drill mixer to mix the adhesive. Approximately 500g/m² of a water-based low emission adhesive is used to fix the flooring in place.

During the installation approximately 10% of the material is lost as off-cuts – this waste is generally sent to landfill.

1.12. Use

Cleaning and maintenance

The recommended maintenance routine provided by Mondo for the product throughout its reference life is: clean once a week using a floor scrubbing machine and an amount of detergent in accordance with Mondo’s maintenance instructions.

Water, detergent and electricity consumption of the cleaning machine are considered in the LCA study.

Prevention of structural damage

To avoid excessive wear, usage should be restricted to the stated areas of application as outlined by the ISO 10874.

Health aspects during usage

Except for Zone-IT, all the products in the range are compliant with GreenGuard and GreenGuard Gold certifications.

PRODUCT	CERTIFICATION
MondoArmor 6 mm	<ul style="list-style-type: none"> GG Certificate Number 75353-410 Certificate Period 02/29/2016 - 10/28/2020 GG Gold Certificate Number 75353-420 Certificate Period 02/29/2016 - 10/28/2020
Sport Impact 6 mm	<ul style="list-style-type: none"> GG Certificate Number 65091-410 Certificate Period 10/29/2014 - 10/28/2020 GG Gold Certificate Number 65091-420 Certificate Period 10/29/2014 - 10/28/2020
Ramflex 6 mm	<ul style="list-style-type: none"> GG Certificate Number 65090-410 Certificate Period 10/29/2014 - 10/28/2020 GG Gold Certificate Number 65090-420 Certificate Period 10/29/2014 - 10/28/2020
Advance New Generation 6 mm	<ul style="list-style-type: none"> GG Certificate Number 65079-410 Certificate Period 10/29/2014 - 10/28/2020 GG Gold Certificate Number 65079-420 Certificate Period 10/29/2014 - 10/28/2020





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1.13. Reference Service Life and Estimated Building Service Life

For this product range, the stated RSL is 20 years. It should be noted, however, that the service life of a resilient floor covering may vary depending on the amount and nature of floor traffic and the type and frequency of maintenance. The manufacturer has provided this service life on the basis of his experience of flooring manufacture and supply. This RSL is applicable as long as the product use complies with that defined by ISO 14041 and EN 1817 in accordance with the product's classification.

1.14. Reuse, Recycling, and Energy Recovery

Although it is technically possible to recycle rubber floorings to create other products, there is not a large infrastructure in place to deal with this waste stream, and as such the majority is sent to landfill. Nevertheless, Mondo uses a portion of pre-consumer and post-consumer granules in its raw materials.

1.15. Disposal

For the purpose of this LCA, it has been assumed that 100% of the product is sent to landfill at the end of its useful life. The transport between construction site and landfill facility is by truck, with an estimated distance of 30 km.

2. Life Cycle Assessment Background Information

2.1. Functional or Declared Unit

The functional unit is one square meter of installed product. The reference service life considered is 20 years.

	Value	Unit
Functional Unit	1	m ²
Mass	8.38	kg

Table 3: Functional Unit

2.2. System Boundary

EPD is declared from cradle to grave, including the following stages:

- A1 – A3: includes the provision of all raw materials and their packaging, transport to the production site and energy consumption during the manufacturing of the product, as well as using production goods and processing of waste and losses generated by the factory.
- A4 – A5: includes the transport from the factory to the final customer, packaging of the final product and the installation of the product, as well as all consumables and energy required and processing of waste and losses generated during the installation.
- B1 – B7: includes provision and transport of all materials, products and services related to the use phase of the product, as well as their related energy and water consumption, and the processing of any resulting waste.
- C1 – C4: includes provision and transport of all materials, products and services related to the end of life phase of the product, including energy and water consumption, as well as the end of life processing of the product.

2.3. Estimates and Assumptions

The estimates and assumptions applied during this LCA are as follows:

- Raw materials containing multiple elements have been modelled according to MSDS, TDS and literature research. For some raw materials, exact



percentages of each element were unavailable – in these cases, a percentage was applied to each element based on literature researches.

- Distances for delivery of the final product are calculated from the factory gate to the centre of the destination country. These distances have been averaged according to the percentage of sales to each respective country.

- It is assumed that no specific impacts should be attributed to the deconstruction phase, as this process is either carried out by hand or in the case of a building demolition, the product adds no impact to the overall impact of the demolition.

2.4. Cut-off Criteria

The cut-off criteria considered are 1% of the total renewable and non-renewable primary energy usage and 1% of the total mass of that unit process. The total neglected input flows per module shall be a maximum of 5% of the total energy usage and mass.

2.5. Data Sources

As a general rule, specific data derived from specific production processes or average data derived from specific production processes have been used as the first choice as a basis for calculating an EPD.

To model the life cycle of the product in question, the software SimaPro 9, developed by Pré Consultants, has been used in conjunction with the LCA database ecoinvent v3.5.

There were no instances of missing data.

2.6. Data Quality

The requirements for data quality and LCA data are in accordance with the specifications of the PCR. All generic data has been checked for plausibility both internally and by the manufacturer.

Temporal Coverage – producer specific data is averaged over 1 year of production and from within the last 5 years (2018). Generic data is taken from the ecoinvent 3.5 database, the entirety of which was updated in 2018. Inputs to and outputs from the system are accounted for over a period of 100 years from the year for which the data set is deemed relevant.

Technological Coverage – the technological coverage of the data reflects the physical reality of the declared product.

Geographical Coverage – whenever possible, country specific data reflecting the reality of the Mondo supply chain has been used. If country specific data is unavailable, European regional data is used in preference to global data sources.

2.7. Period under Review

Data has been reviewed for the production year 2018.

2.8. Allocation

The production has been modeled on data supplied by the manufacturer for their factories in Italy and Luxembourg. The overall values for the factory's material and energy consumptions during a period of one year (2018) have been divided by the annual production of each product to supply a value per m² of flooring produced. It is assumed that the process consumptions are governed by area of flooring processed rather than mass.

2.9. Comparability (Optional)

A comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to EN 15804 and the building context, respectively the product-specific characteristics of performance, are taken into account.



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3. Life Cycle Assessment Scenarios

Table 4. Transport to the building site (A4)

NAME	VALUE	UNIT
Truck		
Fuel type	Diesel	
Liters of fuel	0.044	l/t.km
Vehicle type	Truck 16-32T EURO 5	
Transport distance (Truck)	548	km
Capacity utilization (including empty runs, mass based)	36	%
Gross density of products transported	1 395.8	kg/m ³
Weight of products transported (if gross density not reported)	-	kg
Volume of products transported (if gross density not reported)	-	m ³
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	< 1	-
Ship		
Fuel type	Heavy Fuel Oil	
Liters of fuel	0.0027	l/t.km
Vehicle type	Transoceanic Ship	
Transport distance (Truck)	4 273	km
Capacity utilization (including empty runs, mass based)	36	%
Gross density of products transported	1 395.8	kg/m ³
Weight of products transported (if gross density not reported)	-	kg
Volume of products transported (if gross density not reported)	-	m ³
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	< 1	-



Table 5. Installation into the building (A5)

NAME	VALUE	UNIT
Ancillary materials	6.00E-02	kg
Net freshwater consumption specified by water source and fate (evaporated)	-	m ³
Other resources	-	kg
Electricity consumption	2.20E-02	kWh
Other energy carriers	-	MJ
Product loss per functional unit	8.38E-01	kg
Waste materials at the construction site before waste processing, generated by product installation	7.35E-02	kg
Output materials resulting from on-site waste processing (specified by route; e.g. for recycling, energy recovery and/or disposal)	-	kg
Biogenic carbon contained in packaging	8.20E-02	kg CO ₂
Direct emissions to ambient air, soil and water	-	kg
VOC emissions	-	µg/m ³

Table 6. Reference Service Life

NAME	VALUE	UNIT
RSL	20	years
Declared product properties (at the gate) and finishes, etc.	-	Units as appropriate
Design application parameters (if instructed by the manufacturer), including references to the appropriate practices and application codes)	-	Units as appropriate
An assumed quality of work, when installed in accordance with the manufacturer's instructions	-	Units as appropriate
Outdoor environment, (if relevant for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature	-	Units as appropriate
Indoor environment, (if relevant for indoor applications), e.g. temperature, moisture, chemical exposure)	-	Units as appropriate
Use conditions, e.g. frequency of use, mechanical exposure.	-	Units as appropriate
Maintenance, e.g. required frequency, type and quality of replacement components	Maintenance scenario is defined in the table below	Units as appropriate



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Table 7. Maintenance (B2)

NAME	VALUE	UNIT
Maintenance process information (cite source in report)	Weekly cleaning according to manufacturer's instructions	-
Maintenance cycle	1.04E+03	Number/ RSL
Net freshwater consumption specified by water source and fate (amount evaporated; amount disposed to sewer)	5.10E+00	L/m ² /year
Ancillary materials specified by type (e.g. cleaning agent)	1.04E-01	L/m ² /year
Other resources	-	kg
Energy input, specified by activity, type and amount	1.87E-01	kWh/m ²
Other energy carriers specified by type	-	kWh
Power output of equipment	1.60E+00	kW
Waste materials from maintenance (specify materials)	-	kg
Direct emissions to ambient air, soil and water	-	kg
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants);	Cleaning once a week considering a cleaning time of 0.0375 min/m ²	

Table 8. Repair (B3)

No repair is deemed necessary within the specified RSL.

Table 9. Replacement (B4)

No replacement is deemed necessary within the specified RSL.

Table 10. Refurbishment (B5)

No refurbishment is deemed necessary within the specified RSL.

Table 11. Operational energy use (B6) and Operational water use (B7)

The product consumes no energy and no water within its normal operation.



Table 12. End of life (C1-C4)

NAME		VALUE	UNIT
Assumptions for scenario development (description of deconstruction, collection, recovery, disposal method and transportation)		Product and adhesive are carried out by hand and sent to landfill. Waste transport is made by truck (16-32 metric ton Euro5). A 30km distance to the landfill treatment center has been considered.	
Collection process (specified by type)	Collected separately	-	kg
	Collected with mixed construction waste	8.88E+00	kg
Recovery (specified by type)	Reuse	-	kg
	Recycling	-	kg
	Landfill	8.88E+00	kg
	Incineration	-	kg
	Incineration with energy recovery	-	kg
	Energy conversion efficiency rate	-	
Disposal (specified by type)	Product or material for final deposition	8.88E+00	kg
Removals of biogenic carbon (excluding packaging)		-	kg CO ₂

Table 13. Reuse, Recovery and/or recycling potentials (D), relevant scenario information

NAME	VALUE	UNIT
Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6)	0.00E+00	MJ
Net energy benefit from thermal energy due to treatment of waste declared as exported energy in C4 (R<0.6)	0.00E+00	MJ
Net energy benefit from material flow declared in C3 for energy recovery	0.00E+00	MJ
Process and conversion efficiencies	-	
Further assumptions for scenario development (e.g. further processing technologies. Assumptions on correction factors);	-	



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4. Life Cycle Assessment Results

Table 14. Description of the system boundary modules

EPD Type	PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
	Raw material supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Building Operational Energy Use During Product Use	Building Operational Water Use During Product Use	Deconstruction	Transport	Waste processing	Disposal	Reuse. Recovery. Recycling Potential
	X	X	X	X	X	X*	X	X*	X*	X*	X*	X*	X*	X	X*	X	NA

Table 15: Scope of the study

*module has been considered but has no associated inputs/outputs, therefore does not appear in the results.

NA: Not Applicable





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4.1. Life Cycle Impact Assessment Results

Table 16. North American Impact Assessment Results

TRACI v2.1	A1	A2	A3	A4	A5	B2	C2	C4
GWP 100 [kg CO ₂ eq]	1.01E+01	9.46E-01	3.70E+00	1.22E+00	3.21E+00	8.47E+00	4.40E-02	7.86E-01
ODP [kg CFC-11 eq]	2.58E-06	2.32E-07	4.68E-07	2.85E-07	5.30E-07	5.66E-07	1.08E-08	3.41E-08
AP [kg SO ₂ eq]	5.32E-02	3.39E-03	2.08E-02	1.20E-02	2.32E-02	3.73E-02	1.59E-04	8.37E-04
EP [kg N eq]	1.03E-02	5.26E-04	3.55E-03	8.59E-04	3.04E-03	3.51E-02	2.45E-05	1.24E-03
SFP [kg O ₃ eq]	7.02E-01	7.19E-02	1.49E-01	1.97E-01	1.97E-01	3.87E-01	3.34E-03	1.77E-02
ADP _{element} [kg Sb-eq]	3.68E+01	2.09E+00	5.08E+00	2.56E+00	7.12E+00	4.72E+00	9.68E-02	3.36E-01
ADP _{fossil} [MJ, LHV]	1.01E+01	9.46E-01	3.70E+00	1.22E+00	3.21E+00	8.47E+00	4.40E-02	7.86E-01

Table 17. European Impact Assessment Results

CML v4.2	A1	A2	A3	A4	A5	B2	C2	C4
GWP 100 [kg CO ₂ eq]	1.01E+01	9.45E-01	2.96E+00	1.22E+00	3.65E+00	8.47E+00	4.40E-02	7.86E-01
ODP [kg CFC-11 eq]	2.44E-06	1.75E-07	3.96E-07	2.14E-07	4.64E-07	4.80E-07	8.09E-09	2.57E-08
AP [kg SO ₂ eq]	5.49E-02	3.05E-03	1.95E-02	1.16E-02	2.44E-02	3.49E-02	1.43E-04	6.88E-04
EP [kg PO ₄ ⁻³ eq]	7.01E-03	5.06E-04	3.67E-03	1.21E-03	2.29E-03	1.87E-02	2.35E-05	5.94E-04
SPF [kg ethene eq]	3.17E-02	4.91E-04	1.33E-03	9.98E-04	4.72E-03	4.86E-03	2.28E-05	2.29E-04
ADP _{element} [kg Sb-eq]	9.85E-05	2.90E-06	3.70E-06	2.54E-06	1.76E-05	2.14E-05	1.34E-07	1.36E-07
ADP _{fossil} [MJ, LHV]	2.79E+02	1.43E+01	4.45E+01	1.79E+01	5.66E+01	5.83E+01	6.67E-01	2.39E+00



4.2. Life Cycle Inventory Results

Table 18. Resource Use

PARAMETER	A1	A2	A3	A4	A5	B2	C2	C4
RPR _E [MJ, LHV]	1.18E+01	1.53E-01	1.33E+01	2.65E-01	4.49E+00	1.55E+01	6.67E-03	4.52E-02
RPR _M [MJ, LHV]	4.13E-01	-	5.67E+00	-	6.08E-01	3.12E+01	-	-
RPR _T [MJ, LHV]	1.22E+01	1.53E-01	1.89E+01	2.65E-01	5.09E+00	4.67E+01	6.67E-03	4.52E-02
NRPR _E [MJ, LHV]	1.68E+02	1.46E+01	5.29E+01	1.84E+01	3.08E+01	7.16E+01	6.76E-01	2.47E+00
NRPR _M [MJ, LHV]	1.42E+02	-	3.18E+00	-	3.33E+01	-	-	-
NRPR _T [MJ, LHV]	3.10E+02	1.46E+01	5.61E+01	1.84E+01	6.41E+01	7.16E+01	6.76E-01	2.47E+00
SM [kg]	1.28E+00	-	-	-	1.28E-01	-	-	-
RSF [MJ, LHV]	-	-	-	-	-	-	-	-
NRSF [MJ, LHV]	-	-	-	-	-	-	-	-
RE [MJ, LHV]	-	-	-	-	-	-	-	-
FW [m ³]	1.17E-01	2.36E-03	4.88E-02	3.10E-03	4.61E-02	1.43E-01	1.07E-04	2.44E-03

Table 19. Output Flows and Waste Categories

PARAMETER	A1	A2	A3	A4	A5	B2	C2	C4
WP [m ³]	8.47E+00	3.39E-01	2.48E+00	4.23E-01	2.49E+00	3.22E+01	1.59E-02	1.20E-01
AP [m ³]	1.54E+03	1.01E+02	3.28E+02	1.51E+02	4.59E+02	9.82E+02	4.70E+00	1.60E+01
HWD [kg]	3.27E-01	9.02E-03	4.14E-02	1.30E-02	2.36E-01	5.06E-01	4.33E-04	2.79E-03
NHWD [kg]	4.33E+00	7.57E-01	8.67E-01	6.97E-01	2.67E+00	3.28E+00	3.53E-02	8.92E+00
HLRW [kg] or [m ³]	4.47E-04	9.78E-05	1.65E-04	1.21E-04	1.58E-04	1.74E-04	4.51E-06	1.45E-05
ILLRW [kg] or [m ³]	8.54E-05	8.36E-07	3.39E-05	1.70E-06	2.28E-05	3.63E-05	3.41E-08	2.56E-07
CRU [kg]	-	-	-	-	-	-	-	-
R [kg]	-	-	2.45E-01	-	3.37E-01	-	-	-
MER [kg]	-	-	-	-	-	-	-	-
EE [MJ, LHV]	-	-	-	-	-	-	-	-

Table 20. Carbon Emissions and Removals

PARAMETER	A1	A2	A3	A4	A5	B2	C2	C4
BCRP [kg CO ₂]	-	-	-	-	-	-	-	-
BCEP [kg CO ₂]	-	-	-	-	-	-	-	-
BCRK [kg CO ₂]	-	-	8.20E-02	-	-	-	-	-
BCEK [kg CO ₂]	-	-	-	-	8.20E-02	-	-	-
BCEW [kg CO ₂]	-	-	-	-	-	-	-	-
CCE [kg CO ₂]	-	-	-	-	-	-	-	-
CCR [kg CO ₂]	-	-	-	-	-	-	-	-
CWNR [kg CO ₂]	-	-	-	-	-	-	-	-



RUBBER SPORT FLOORING – THICKNESS 6 MM
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According to ISO 14025.
EN 15804 and ISO 21930:2017

5. LCA Interpretation

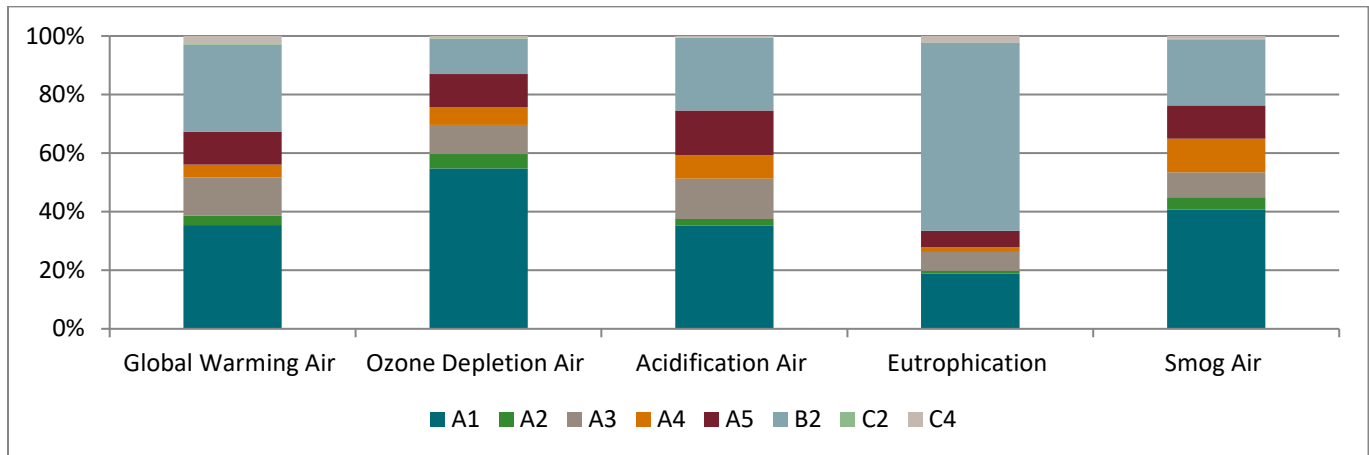


Figure 2: Graph depicting the impact indicators as calculated by the TRACI method

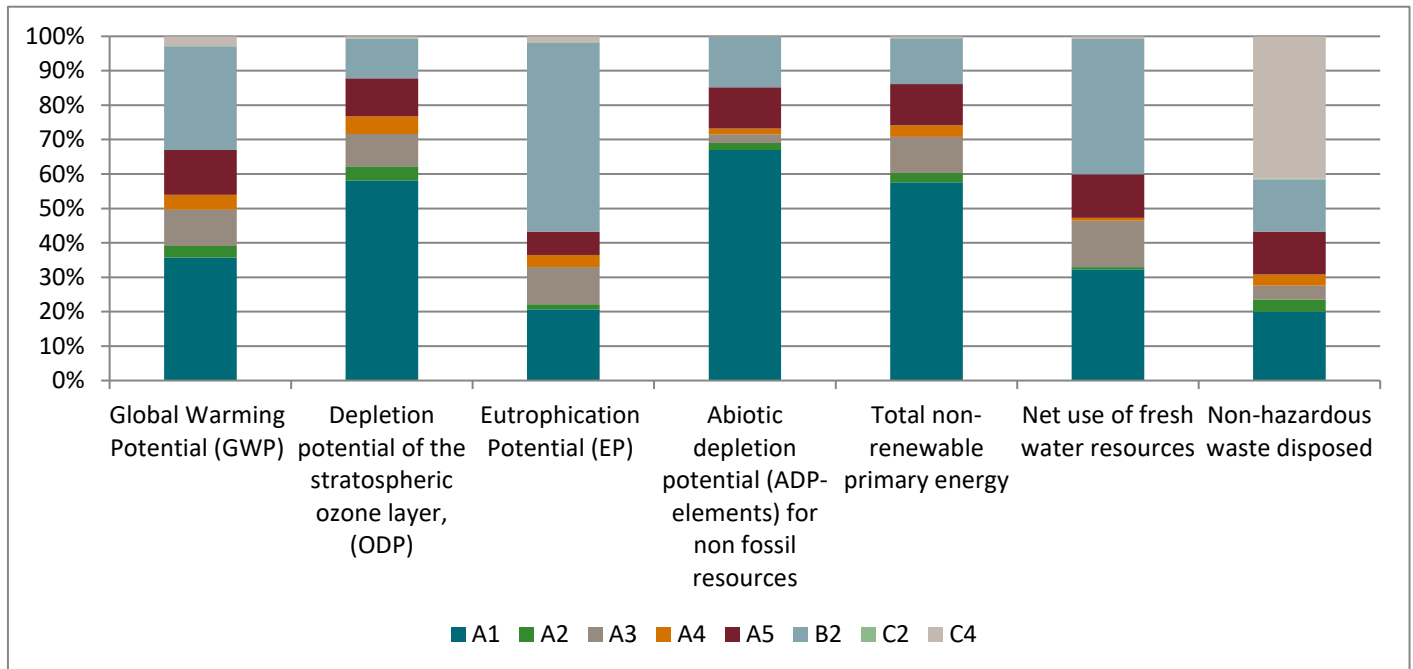


Figure 3: Graph depicting selection of impact indicator results calculated according to EN 15804

The main contributors to the environmental impacts of the product are Stage A1 (Extraction and supply of raw materials) and Stage B2 (Maintenance). The maintenance stage has high associated impacts which correspond to low-impact cleaning activities repeated weekly over the lifetime of the product, resulting in a high lifetime impact. The Stage A5 (Installation) also has high impacts, due to the use of an adhesive and the quantity of product wasted during an average installation. The impacts during the Stage A3 (Manufacturing) are mostly due to the electricity used by the factory.





RUBBER SPORT FLOORING – THICKNESS 6 MM
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According to ISO 14025.
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6. Additional Environmental Information

6.1. Environment and Health During Manufacturing

Mondo's factory conforms to the ISO 9001 Quality Management Systems and ISO 14001 Environmental Management System. All products in the range, except Zone-IT, also conform to the Greenguard Gold certification standard, as described in §6.4.

6.2. Environment and Health During Installation

The manufacturer's guidelines should be adhered to during the installation of this product.

6.3. Extraordinary Effects

Fire

Fire behaviour has been tested according to EN 13501-1. MondoArmor, Zone-IT and Ramflex are classified Cfl-S2 while Sport Impact is classified Cfl-S1.

Critical Radiant Flux has been tested according to ASTM E648. Advance New Generation, MondoArmor, Zone-IT and Ramflex are classified Class 1, with a result of $\geq 0.45 \text{ W/cm}^2$.

Water

The product is impermeable to water.

Mechanical Destruction

Mechanical damage does not chemically alter the product.





RUBBER SPORT FLOORING – THICKNESS 6 MM
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According to ISO 14025.
EN 15804 and ISO 21930:2017

6.4. Environmental Activities and Certifications

Except for Zone-IT, all the products in the range are compliant with GreenGuard and GreenGuard Gold certifications.

GREENGUARD Certification

Standard: UL 2818 – 2013 Standard for Chemical Emissions for Building Materials, Finishes and Furnishings

Certification Status : Certified

PRODUCT	NUMBER	CERTIFICATION PERIOD
MondoArmor 6 mm	75353-410	02/29/2016 - 10/28/2020
Sport Impact 6 mm	65091-410	10/29/2014 - 10/28/2020
Ramflex 6 mm	65090-410	10/29/2014 - 10/28/2020
Advance New Generation 6 mm	65079-410	10/29/2014 - 10/28/2020



GREENGUARD Gold Certification

Standard: UL 2818 -2013 Gold Standard for Chemical Emissions for Building Materials, Finishes and Furnishings

Certification Status: Certified

PRODUCT	NUMBER	CERTIFICATION PERIOD
MondoArmor 6 mm	75353-420	02/29/2016 - 10/28/2020
Sport Impact 6 mm	65091-420	10/29/2014 - 10/28/2020
Ramflex 6 mm	65090-420	10/29/2014 - 10/28/2020
Advance New Generation 6 mm	65079-420	10/29/2014 - 10/28/2020

6.5. Further Information

Further information concerning the product may be found at the company website: <https://www.mondoworldwide.com/emea/en>

7. Supporting Documentation

All documentation necessary to confirm the data provided in this EPD has been submitted to the critical reviewer.





RUBBER SPORT FLOORING – THICKNESS 6 MM
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According to ISO 14025.
EN 15804 and ISO 21930:2017

8. References

SUSTAINABILITY REPORTING STANDARDS

EN 15804:2012-04+A1 2013 - Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

ISO 14025:2011-10 - Environmental labels and declarations – Type III environmental declarations – Principles and procedures

ISO 14040: 2006 – Environmental management – Life cycle assessment – Principles and framework

ISO 14044: 2006 – Environmental management – Life cycle assessment – Requirements and guidelines

ISO 21930: 2017 – Sustainability in buildings and civil engineering works – Core rules for environmental products declarations of construction products and services

UL ENVIRONMENT

UL Environment General Program Instructions April 2017, version 2.1

Product Category Rule (PCR) Guidance for Building-Related Products and Services:

- Part A: Life Cycle Assessment Calculation Rules and Report Requirements UL Environment (September 2018 V3.2)
- Part B: Flooring EPD Requirements (September 2018 2nd Edition)

www.ul.com

LCI Database: ecoinvent V3.5

ecoinvent Life Cycle Inventory database Version 3

<http://www.ecoinvent.org>





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According to ISO 14025.
EN 15804 and ISO 21930:2017

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