

ISOPIPE® S.A.

Rebuild the future!

ENVIRONMENTAL PRODUCT DECLARATION

**ISOPIPE S.A. – TC Flexible Elastomeric
Foam Insulation**

In accordance with ISO 14025 and EN 15804 + A1



EPD Registration Number

S-P-05562

Program

The International EPD® System
www.environdec.com

Program operator

EPD International AB

Publication Date

28/02/2022

Date of Validity

27/02/2027

UN CPC

362: Other rubber
products

PROGRAM INFORMATION

Program



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Owner of the EPD



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Product category rules (PCR):

PCR review was conducted by:

**Independent third-party verification
of the declaration and data,
according to ISO 14025:**

Verified by:

Technical support:

PCR 2012:01 Construction products and construction
services (EN 15804:A1), v.2.34 Date 2021-11-08

The Technical Committee of the International EPD
System Contact via info@environdec.com

- EPD process certification
- EPD verification (external)

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COMPANY PROFILE

ISOPIPE S.A. was founded in 1997 and its industrial premises cover over 30,000 m². ISOPIPE S.A. specialized in vertical production of insulation worldwide, and it is engaged in the production of the widely used closed cell synthetic rubber insulation with the trademark ISOPIPE.

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PRODUCT DESCRIPTION

ISOPIPE TC Flexible Elastomeric Foam Insulation is a Nitrile Butadiene Rubber (NBR) based foam insulation with a significantly high percentage of 98.5% of closed cells. ISOPIPE TC ensures long-term and reliable thermal efficiency. ISOPIPE TC presents the following benefits:

- Excellent insulation properties thanks to closed cell structure
- Outstanding thermal performance and condensation resistance
- Great oil and grease resistance as an NBR based product
- Wide range of sizes and forms, making its application easier
- Short lead time due to high flexibility of production
- Performance of ISOPIPE TC is guaranteed through continuous supervision and factory tests

ISOPIPE TC Flexible Elastomeric Foam Insulation is suitable for the following applications, covering a wide range of needs:



PRODUCT DESCRIPTION

Technical Data

Indicatively, some mechanical and thermal properties of ISOPIPE TC Flexible Elastomeric Foam Insulation are reported in the adjacent table.

Product Range

- **Pipes:** Available in thickness of 6, 9, 13, 19, 25, 32, 40 and 50mm and pipe diameters up to 139mm. Standard length is 1 and 2 m.
- **Rolls:** Available in thickness of 6, 10, 13, 19, 25, 32, 40 and 50mm, in width of 1m and length up to 30m.
- **Coil:** Highly practical for installers and technicians. No scraps; cut only the necessary length and store the rest.

Property	Technical Data	Test Method
Thermal Conductivity (λ)	-20 °C -0.031W/mK	EN 12667
	0 °C -0.033W/mK	
	20 °C -0.035W/mK	
	30 °C -0.036W/mK	
Permeability (μ)	$\geq 7,000$	EN 13469 EN 12086
Operating Temperatures	-50 °C to + 110 °C	EN 14706 EN 14707
Fire Rating (FR)	Coil, Pipes: B-S2, d0 Class 0, Class 1 Class A or Class 1	EN 13501-1 BS 476 ASTM E84
	Rolls: B-S3, d0	EN 13501-1
Density	60 kg/ m3, ± 10 kg/m3	EN 13467 & EN 1602EN
Tensile Strength (Pa)	> 0.15 MPa	ISO 1798
Elongation at break	> 150%	
Weather Resistance	Good	EN ISO 1798
Oil & Grease Resistance	Very Good	ASTM D 471

PRODUCT DESCRIPTION

Base Materials

The composition of a reference **ISOPIPE TC Flexible Elastomeric Foam Insulation** product is indicatively reported in the next table. The contribution of material categories to the reference product is presented in % in weight.

ISOPIPE TC Flexible Elastomeric Foam Insulation	
Ingredient	Composition (%)
Flame retardants	28.0
Blowing Agent	3.0
Rubber & Polymers	31.0
Fillers & Pigments	17.0
Vulcanization, Additives, Plasticisers	21.0

ISOPIPE TC Flexible Elastomeric Foam Insulation contains Chlorinated paraffin and C, C' - Azodiformamide, which are classified as "Substance of Very High Concern", under the European chemical Directive REACH. These components are considered 'very toxic to aquatic life, very toxic to aquatic life with long lasting effects and may cause harm to breast-fed children and PBT/ vPvB' and can cause 'allergy or asthma symptoms or breathing difficulties if inhaled due to respiratory sensitizing properties', respectively.



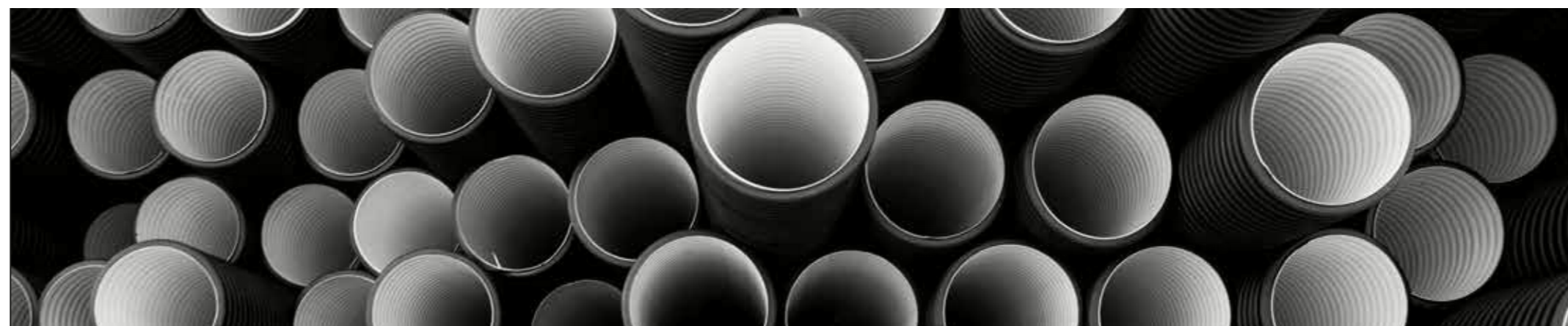
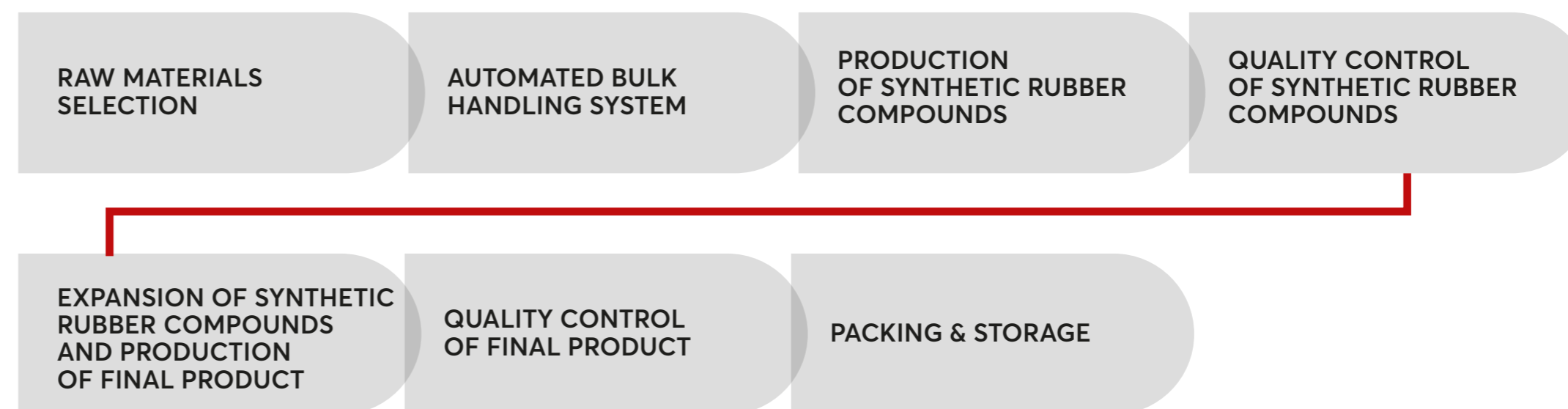
PRODUCT DESCRIPTION

Nominal Pipe Diameter			Int. Diameter	Nominal Wall Thickness												
Fe	Cu		PP	-	6mm - 1/4"		9mm - 3/8"		13mm - 1/2"		19mm - 3/4"		25mm - 1"		32mm - 1 1/4"	
Inch	mm	Inch	-	min-max	Code	m/Crt	Code	m/Crt	Code	m/Crt	Code	m/Crt	Code	m/Crt	Code	m/Crt
-	6	1/4"	-	7-8	6x6	1432	9x6	280	13x6	160	19x6	88				
-	10	3/8"	-	11-12	6x10	300	9x10	228	13x10	142	19x10	82	25x10	48		
-	12	1/2"	-	13-14	6x12	274	9x12	200	13x12	126	19x12	76	25x12	46		
1/4"	15	5/8"	-	16-17	6x15	230	9x15	152	13x15	110	19x15	62	25x15	44	32x15	30
3/8"	18	3/4"	-	19-20	6x18	190	9x18	142	13x18	98	19x18	58	25x18	40	32x18	30
1/2"	22	7/8"	-	23-24	6x22	160	9x22	116	13x22	78	19x22	52	25x22	30	32x22	28
-	25	1"	25	26-27	6x25	130	9x25	92	13x25	70	19x25	46	25x25	30	32x25	26
3/4"	28	1 1/8"	-	29-30	6x28	120	9x28	86	13x28	66	19x28	44	25x28	30	32x28	24
1"	35	1 3/8"	-	36-37	6x35	108	9x35	70	13x35	52	19x35	30	25x35	24	32x35	22
1 1/4"	42	1 5/8"	40	43-44			9x42	60	13x42	48	19x42	30	25x42	22	32x42	16
1 1/2"	48	1 7/8"	-	49-50			9x48	56	13x48	42	19x48	26	25x48	18	32x48	16
-	54	2 1/8"	50	55-56			9x54	46	13x54	34	19x54	24	25x54	18	32x54	16
2"	60	2 3/8"	-	61-62			9x60	42	13x60	30	19x60	22	25x60	18	32x60	12
-	64	2 1/2"	63	65-66			9x64	40	13x64	28	19x64	18	5x64	16	32x64	12
2 1/2"	76	3"	75	77-79			9x76	34	13x76	24	19x76	18	25x76	12	32x76	10
3"	89	3 9/16"	90	90-92			9x88	30	13x88	22	19x88	14	25x88	12	32x88	10
3 1/2"	108	4 1/4"	110	110-112			9x108	24	13x108	20	19x108	12			32x108	8
4"	114	4 9/16"	-	116-118			9x114	24	3x114	20	19x114	12	25x114	8	32x114	8
5"	139	5 1/2"	-	141-143							19x139	8	25x139	6	32x139	6

MANUFACTURING PROCESS

ISOPIPE TC Flexible Elastomeric Foam Insulation production is a continuous process and is distinguished in the following phases:

Mixture preparation → Product molding by injection → Expansion →
Sample quality control → Product packaging → Various manufacturing controls



LIFE CYCLE ASSESSMENT INFORMATION

Declared Unit

The declared unit is 1 kg TC Flexible Elastomeric Foam Insulation. Packaging material is included but packaging weight is not considered within the 1 kg of the declared unit.

System boundary

This EPD covers the **cradle-to-gate** approach. Therefore, the defined system boundaries include Raw material production and supply (A1), Transportation (A2) and Manufacturing (A3) Life Cycle stages.

Product group ranges

ISOPIPE TC Flexible Elastomeric Foam Insulation products present various dimension and thickness characteristics. The environmental impact of each specific product code can be determined based on the correlation to the environmental performance of 1 kg of ISOPIPE TC Flexible Foam Insulation. Also, a mass to length conversion factor is declared.

Conversion factor	Pipes	Rolls	Coil
Kg/m	0.082	0.991	0.331

LIFE CYCLE ASSESSMENT INFORMATION

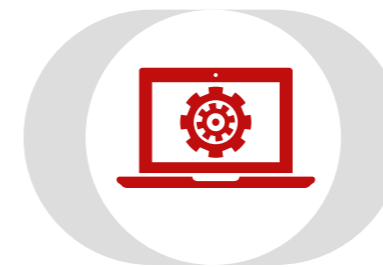
Product Stage	Construction Process Stage	Use Stage	End of Life Stage	Resource Recovery Stage
A1 Raw material				
A2 Transport				
A3 Manufacturing				
MND A4 Transport				
MND A5 Construction installation				
MND B1 Use				
MND B2 Maintenance				
MND B3 Repair				
MND B4 Replacement				
MND B5 Refurbishment				
MND B6 Operational energy use				
MND B7 Operational water use				
MND C1 Deconstruction, demolition				
MND C2 Transport				
MND C3 Waste processing				
MND D Reuse, recycling, or energy recovery potentials				

EPD TYPE



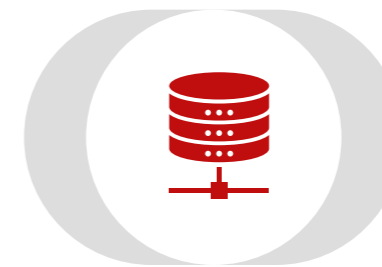
Specific

SOFTWARE



GaBi ts version
10.6.0.110

DATABASE



Ecoinvent 3.7.1
& Professional 2021

MND: Module Not Declared

LIFE CYCLE ASSESSMENT INFORMATION

Cut-off criteria

Life Cycle Inventory data for a minimum of 99% of total inflows (mass and energy) to the upstream and core Life Cycle module are being included. Nevertheless, it is determined that the total neglected input flows are much less than 1% of total energy and mass. These neglected inflows refer to any potential mass inputs that have not been identified and measured properly. No inflow was omitted intentionally.

The main flows that have been excluded from the modelling of the studied system are:

- 0.6% of TC raw materials have been excluded since those components could not efficiently be determined by a process data set.
- Waste treatment of packaging scrap occurred in Module A3 (carton board, stretch film, etc.) is not taken into consideration.

Assumptions, Allocation and Limitations

- Regarding the exclusion of product life cycle stages and processes, use, end-of-life, and reuse stage have not been accounted for. Also, the capital goods (construction of the site) are not included in this LCA study.
- ISOPIPE S.A. TC Flexible Elastomeric Foam Insulation manufacturing renders no co-products. Thus, there is no need for product allocation.
- Regarding electricity and natural gas consumption in the manufacturing process of ISOPIPE TC Flexible Foam Insulation, an allocation based on the mass of the interested products has been applied. Specifically, the assumption of allocation is proportional to the production volumes of the interested products.
- Waste produced from the manufacturing activities of TC Flexible Elastomeric Foam Insulation manufacturing come in extremely small volumes compared to the overall production of the interested products. Waste is collected and treated through recycling and landfill processes.
- A default mean of road transportation "Truck Euro 6 – 9.3t payload – 12 -14t gross weight" was assumed. Weighted average of the distance covered, and times needed were taken into account. Regarding ship transportation, "Average ship, 3,500t payload capacity" was assumed due to lack of actual data.

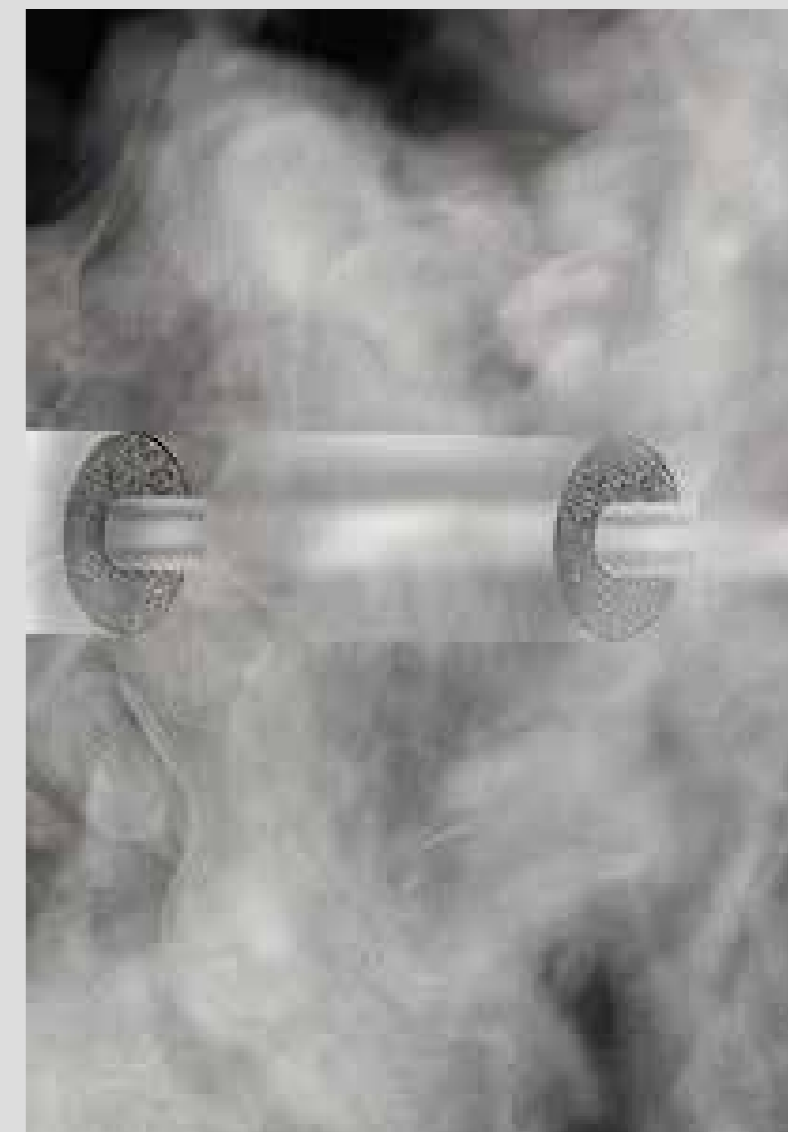
LIFE CYCLE ASSESSMENT INFORMATION

Background data and data quality

For all processes, primary data were collected and provided by **ISOPIPE S.A.** Data related to material and energy flows of the defined system, which later were expressed in terms of environmental impacts, were acquired from the company developing the EPD and data related to life cycle impacts resulted from calculations based on databases and characterization factors. Primary data refer to August 2020 to July 2021 reference period. Background data were used for processes the producer has no influence on. Background (generic) data were acquired from available trust-worthy databases. All background data are recent and are no more than 10 years old. A compilation of Ecoinvent v.3.7.1 and Professional 2021 databases was used.

Comparability




- EPDs within the same product category but from different programs may not be comparable.
- EPDs of construction products may not be comparable if they do not comply with EN 15804.
- This EPD and "PCR2012:01 Construction products and construction services" are available on the website of The International EPD[®]System (www.environdec.com).



ENVIRONMENTAL PERFORMANCE IMPACT INDICATORS






Impact/ 1 kg ISOPIPE TC Flexible Elastomeric Foam Insulation

ENVIRONMENTAL IMPACT CATEGORIES		A1 – Raw Material 	A2 – Transportation 	A3 – Manufacturing 	TOTAL
Global Warming Potential (GWP ₁₀₀)	kg CO ₂ eq.	2.515	0.018	0.403	2.936
Ozone Layer Depletion Potential	kg R11 eq.	4.693E-10	-3.579E-14	3.192E-08	3.239E-08
Acidification Potential	kg SO ₂ eq.	8.595E-03	2.091E-04	5.336E-04	9.337E-03
Eutrophication Potential	kg PO ₄ ⁻³ eq.	2.528E-03	2.309E-05	8.480E-05	2.636E-03
Photochemical Ozone Creation Potential	kg C ₂ H ₄ eq.	7.847E-04	1.441E-05	8.619E-05	8.853E-04
Depletion of abiotic resources (elements)	kg Sb eq.	2.325E-03	3.592E-06	4.360E-07	2.329E-03
Depletion of abiotic resources (fossil)	MJ net calorific value	57.348	0.248	6.673	64.269

ENVIRONMENTAL PERFORMANCE IMPACT INDICATORS



		Impact/ 1 kg ISOPIPE TC Flexible Elastomeric Foam Insulation			
		A1 –  Raw Material	A2 –  Transportation	A3 –  Manufacturing	TOTAL
USE OF RESOURCES					
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	5.671	0.014	0.239	5.925
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	-	-	-	-
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	5.671	0.014	0.239	5.925
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	58.826	0.253	6.841	65.920
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	-	-	-	-
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	58.826	0.253	6.841	65.920
Use of secondary material	kg	-	-	-	-
Use of renewable secondary fuels	MJ, net calorific value	-	-	-	-
Use of non-renewable secondary fuels	MJ, net calorific value	-	-	-	-
Use of net fresh water	kg	0.017	1.613E-05	8.716E-04	0.018

ENVIRONMENTAL PERFORMANCE IMPACT INDICATORS



Waste Categories

Hazardous waste disposed	kg
Non-hazardous waste disposed	kg
Radioactive waste disposed	kg

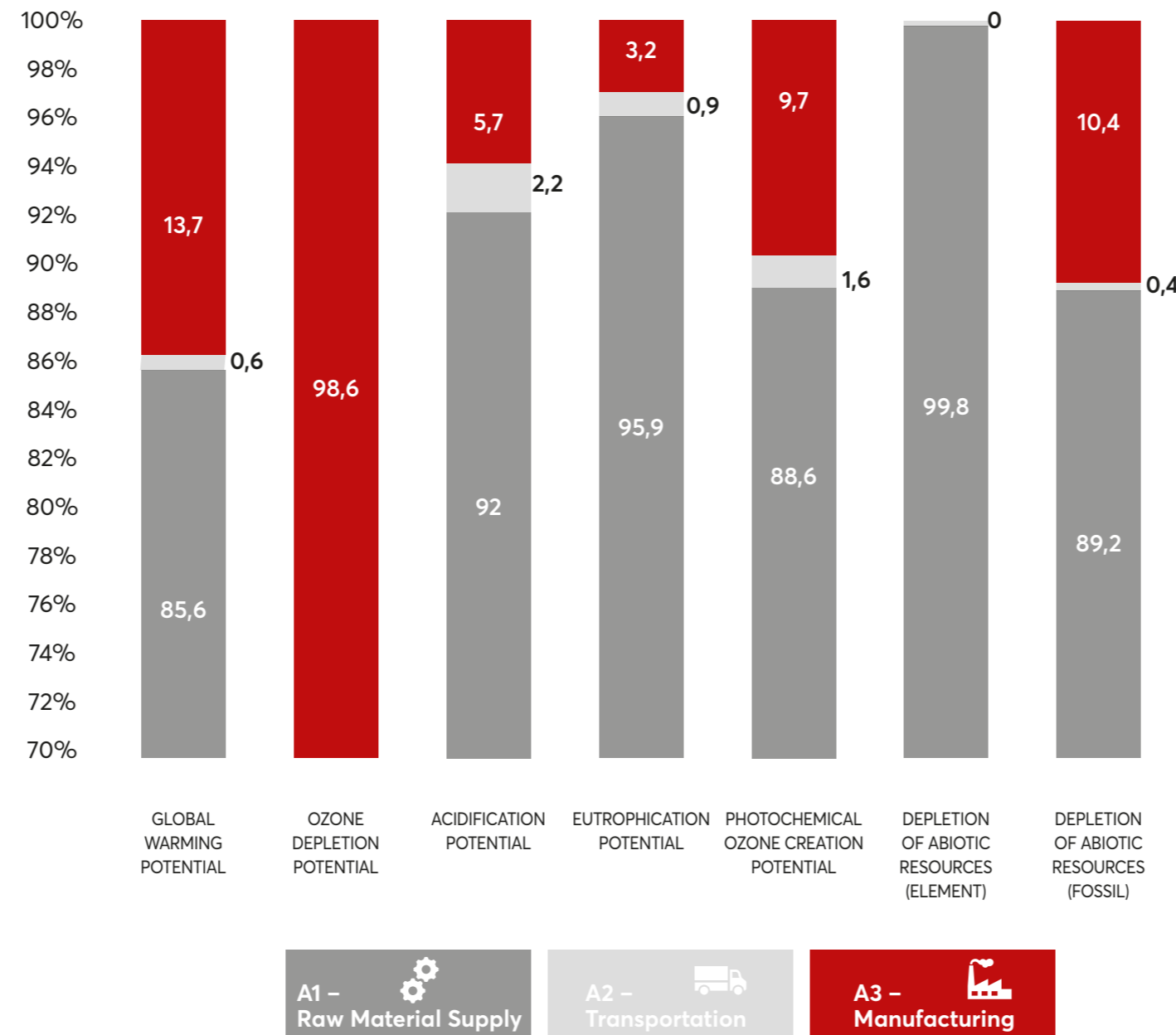
Impact/ 1 kg ISOPIPE TC Flexible Elastomeric Foam Insulation

A1 – Raw Material	A2 – Transportation	A3 – Manufacturing	TOTAL
3.739E-05	2.993E-09	2.262E-10	3.739E-05
0.015	3.742E-05	9.168E-03	0.024
5.438E-04	2.553E-07	2.547E-05	5.695E-04



INTERPRETATION

The following figure represents the influence of the Life Cycle stages A1, A2, and A3 on the environmental impact indicators formation. It can be clearly noticed that the majority of the analyzed impact categories are mainly influenced by the raw material supply stage (A1).



- ODP is almost exclusively influenced by the manufacturing stage (Module A3).
- The Global Warming Potential (GWP) of 1 kg of TC Flexible Foam Insulation is dominated by 85.6% by the production and supply of Raw materials. Module A2 contributes slightly to the impact category. Module A3 has a relatively smaller influence of 13.7% on the formation of the GWP impact.
- Acidification Potential is mainly influenced by Raw material supply stage. More specifically, Module A1 is accounted for the 92.0% of the impact, whereas Module A3 is only responsible for 5.7%.
- A slightly similar pattern is followed regarding the formation of Eutrophication Potential indicator. Contribution of Module A2 is marginal, where Raw material extraction and production stage (A1) has a dominant share of 96.0%.
- Natural gas combustion at the manufacturing stage is responsible for the participation of Module A3 in impact categories formation.

REFERENCES

- International EPD® System, General Program Instructions for the International EPD System, version 4
- International EPD® System, PCR 2012:01 Construction products and construction services (EN 15804:A1), v.2.34
- International Organization for Standardization (ISO), Environmental labels and declarations – Type III environmental declarations – Principles and procedures. ISO 14025:2006
- EN 15804:2012+A1:2013 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- International Organization for Standardization (ISO), Environmental management – Life Cycle assessment – Principles and framework. ISO 14040:2006
- International Organization for Standardization (ISO), Environmental management – Life Cycle assessment – Requirements and guidelines. ISO 14044:2006
- The International EPD® System – The International EPD System is a programme for type III environmental declarations, maintaining a system to verify and register EPDs as well as keeping a library of EPDs and PCRs in accordance with ISO 14025. www.environdec.com
- EN ISO 14001 – Environmental Management Systems – Requirements
- ISO 14020 – Environmental Labels and Declarations – General Principles
- Sphera – GaBi Product Sustainability software – www.sphera.com



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ISOPIPE S.A. – TC Solar Covering Insulation

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EPD Registration Number

S-P-05572

Program

The International EPD® System
www.environdec.com

Program operator

EPD International AB

Publication Date

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UN CPC

362: Other rubber products

PROGRAM INFORMATION

Program



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The Technical Committee of the International EPD System
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- EPD process certification
- EPD verification (external)

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PRODUCT DESCRIPTION

ISOPIPE TC Solar Covering Insulation is a special polymer external protection membrane available in silver, black and white color, offering resistance to ultraviolet radiation and other atmospheric agents. Basically, ISOPIPE Solar is an external covering applied to ISOPIPE TC Foam Insulation. ISOPIPE Solar Covering Insulation brings the following benefits:

- Protection against harsh weather and UV radiation
- Oil and grease resistant
- Protective film with high temperature resistance up to +80 0C Solar Silver Covering contains a small quantity of aluminum
- No need to tape, paint or cover and easily cleaned with standard cloth
- Attractive appearance & professional result

ISOPIPE TC Solar Covering is suitable for the following applications, covering a wide range of needs:



Technical Data

Indicatively, some technical characteristics of **ISOPIPE TC Solar Covering Insulation** are reported in the following table.

Property	Data	Test Method	Lab/ Test Report
Temperatures (0C) on Surface	-400C to +800C	ISO 306	TUV Nord Baltic Ltd., TNO, Swedcert, EBETAM0.8 gr
Thickness	< 0.40 mm: ±0.1 mm	DIN 53370	Sel-monitoring
Tensile strength (Pa)	>0.10 Mpa	ASTM D 882	
Elongation at break	>200%		
UV resistance	Very good	ISO 4892-2	MIRTEC
Weather resistance	Very good	ISO 4892-2	MIRTEC
Oil & Grease resistance	Very good	ASTM D 471	Self-monitoring
Colour of Solar Film	White, Silver & Black		
Warranty	3 years		

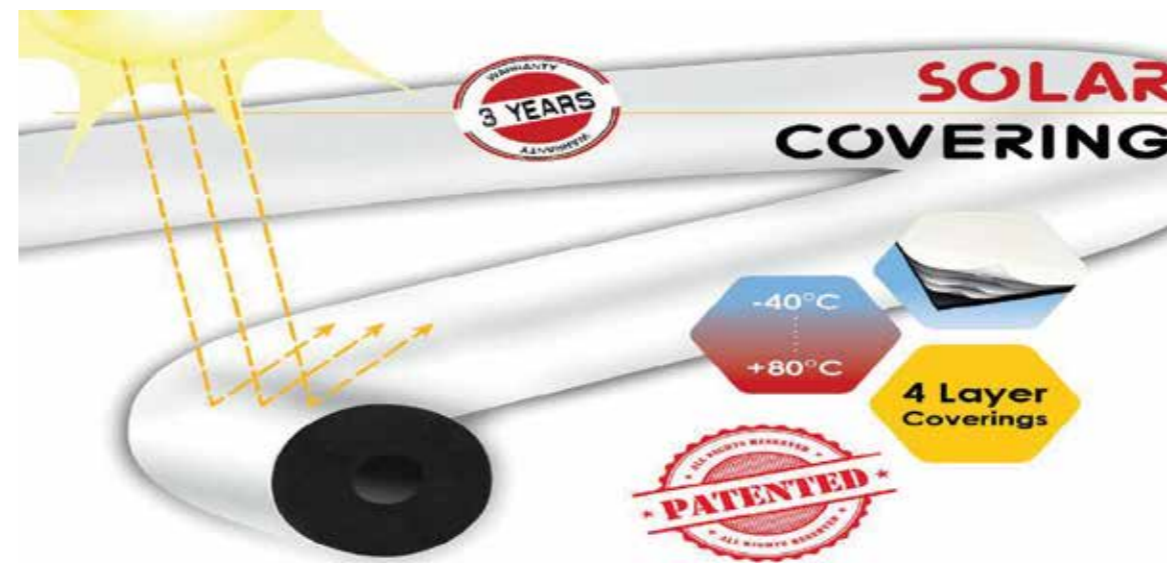
PRODUCT DESCRIPTION

Base Materials

ISOPIPE TC Solar Covering Insulation consists of 57.6% of ISOPIPE TC Foam Insulation and 42.4% of other components. The composition of the reference product is indicatively reported in the following table. The contribution of material categories to the reference product is presented in % in weight.

ISOPIPE SOLAR Covering Insulation	
Ingredient	Composition (%)
Flame retardants	16.0
Blowing Agent	1.5
Rubber & Polymers	52.0
Fillers & Pigments	14.0
Vulcanization, Additives, Plasticisers	16.5

ISOPIPE TC Solar Covering Insulation contains Chlorinated paraffin and C, C' - Azodiformamide, which are classified as "Substance of Very High Concern", under the European chemical Directive REACH. These components are considered 'very toxic to aquatic life, very toxic to aquatic life with long lasting effects and may cause harm to breast-fed children and PBT/ vPvB' and can cause 'allergy or asthma symptoms or breathing difficulties if inhaled due to respiratory sensitizing properties', respectively.



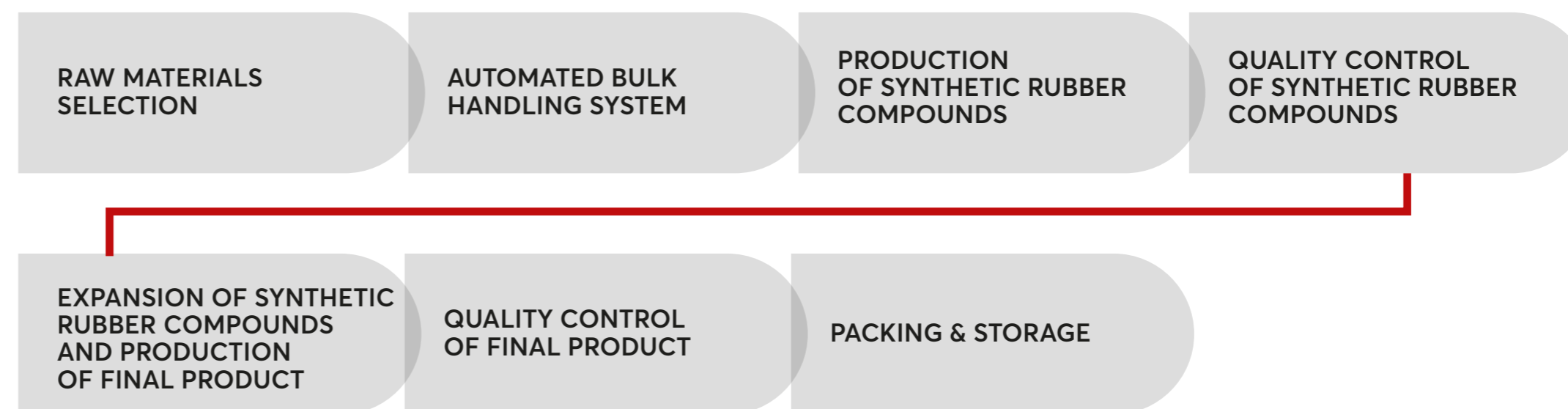
PRODUCT DESCRIPTION

Nominal Pipe Diameter				Nominal Wall Thickness									
Fe	Cu		PP	9mm-3/8"		13mm-1/2"		19mm-3/4"		25mm-1"		32mm-1 1/4"	
Inch	mm	Inch		Code	m/Crt	Code	m/Crt	Code	m/Crt	Code	m/Crt	Code	m/Crt
-	10	3/8"	-	9x10	228	13x10	142	19x10	82				
-	12	1/2"	-	9x12	200	13x12	126	19x121	76				
1/4"	15	5/8"	-	9x15	152	13x15	110	9x15	62	25x15	44	32x15	30
3/8"	18	3/4"	-	9x18	142	13x18	98	19x18	58	25x18	40	32x18	30
1/2"	22	7/8"	-	9x22	116	13x22	78	19x221	52	25x22	30	32x22	28
-	25	1"	25	9x25	92	13x25	70	9x25	46	25x25	30	32x25	26
3/4"	28	1 1/8"	-	9x28	86	13x28	66	19x28	44	25x28	30	32x28	24
1"	35	1 3/8"	-	9x35	70	13x35	52	19x35	30	25x35	24	32x35	22
1 1/4"	42	1 5/8"	40	9x42	60	13x42	48	19x42	30	25x42	22	32x42	16
1 1/2"	48	1 7/8"	-	9x48	56	13x48	42	19x48	26	25x48	18	32x48	16
-	54	2 1/8"	50	9x54	46	13x54	34	19x54	24	25x54	18	32x54	16
2"	60	2 3/8"	-	9x60	42	13x60	30	19x60	22	25x60	18	32x60	10
-	64	2 1/2"	63	9x64	28	13x64	20	19x64	16	25x64	10	32x64	10
2 1/2"	76	3"	75	9x76	18	13x76	14	19x76	12	25x76	9	32x76	8
3"	89	3 9/16"	90	9x88	16	13x88	12	19x88	10	25x88	8	32x88	6
3 1/2"	108	4 1/4"	110	9x108	12	13x108	8	19x108	8	25x108	8	32x108	6
4"	114	4 9/16"	-	9x114	10	13x114	8	19x114	6	25x114	5	32x114	6
5"	139	5 1/2"	-					19x139	5	25x139	4		

MANUFACTURING PROCESS

ISOPIPE TC Solar Covering Insulation production is a continuous process and is distinguished in the following phases:

Extruder start-up → Product molding by injection → Sample quality control →
Product packaging → Various manufacturing controls



LIFE CYCLE ASSESSMENT INFORMATION

Declared Unit

The declared unit is 1 kg TC Solar Covering Insulation. Packaging material is included but packaging weight is not considered within the 1 kg of the declared unit.

System boundary

This EPD covers the **cradle-to-gate** approach. Therefore, the defined system boundaries include Raw material production and supply (A1), Transportation (A2) and Manufacturing (A3) Life Cycle stages.

Product group ranges

ISOPIPE TC Solar Covering Insulation products present various dimension and thickness characteristics. The environmental impact of each specific product code can be determined based on the correlation to the environmental performance of 1 kg of ISOPIPE TC Solar Covering Insulation. Also, a mass to length conversion factor is declared.

Conversion factor

kg/m

0.128

LIFE CYCLE ASSESSMENT INFORMATION

Product Stage	Construction Process Stage	Use Stage	End of Life Stage	Resource Recovery Stage
A1 Raw material	A4 Transport	B1 Use	C1 Deconstruction, demolition	D Reuse, recycling, or energy recovery potentials
A2 Transport	A5 Construction installation	B2 Maintenance	C2 Transport	
A3 Manufacturing		B3 Repair	C3 Waste processing	
MND	MND	B4 Replacement		
MND		B5 Refurbishment		
		B6 Operational energy use		
		B7 Operational water use		

EPD TYPE



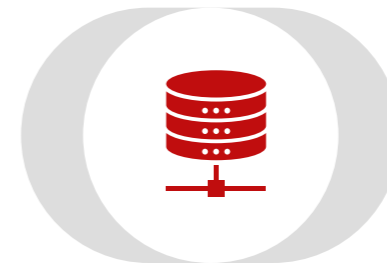
Specific

SOFTWARE



GaBi ts version
10.6.0.110

DATABASE



Ecoinvent 3.7.1
& Professional 2021

MND: Module Not Declared

LIFE CYCLE ASSESSMENT INFORMATION

Cut-off criteria

Life Cycle Inventory data for a minimum of 99% of total inflows (mass and energy) to the upstream and core Life Cycle module are being included. Nevertheless, it is determined that the total neglected input flows are much less than 1% of total energy and mass. These neglected inflows refer to any potential mass inputs that have not been identified and measured properly. No inflow was omitted intentionally.

The main flows that have been excluded from the modelling of the studied system are:

- 0.6% of TC raw materials have been excluded since those components could not efficiently be determined by a process data set. However, TC insulation accounts for 57.6% of the total raw materials used for TC Solar Covering Insulation production, therefore only 0.35% of the total mass inputs were not considered within the boundaries of the study.
- Waste treatment of packaging scrap occurred in Module A3 (carton board, stretch film, etc.) is not taken into consideration.

Assumptions, Allocation and Limitations

- Regarding the exclusion of product life cycle stages and processes, use, end-of-life, and reuse stage have not been accounted for. Also, the capital goods (construction of the site) are not included in this LCA study.
- ISOPIPE S.A. TC Solar Covering Insulation manufacturing renders no co-products. Thus, there is no need for product allocation.
- Regarding electricity consumed in the manufacturing process of ISOPIPE Solar Covering Insulation, an allocation based on the mass of the interested products has been applied. Specifically, the assumption of allocation is proportional to the production volumes of the interested products.
- Waste produced from the manufacturing activities of TC Solar Covering Insulation manufacturing come in extremely small volumes compared to the overall production of the interested products. Waste is collected and treated through recycling and landfill processes.
- A default mean of road transportation "Truck Euro 6 – 9.3t payload – 12-14t gross weight" was assumed. Weighted average of the distance covered, and times needed were taken into account. Regarding ship transportation, "Average ship, 3,500t payload capacity" was assumed due to lack of actual data.

LIFE CYCLE ASSESSMENT INFORMATION

Background data and data quality

For all processes, primary data were collected and provided by ISOPIPE S.A. Data related to material and energy flows of the defined system, which later were expressed in terms of environmental impacts, were acquired from the company developing the EPD and data related to life cycle impacts resulted from calculations based on databases and characterization factors. Primary data refer to August 2020 to July 2021 reference period. Background data were used for processes the producer has no influence on. Background (generic) data were acquired from available trust-worthy databases. All background data are recent and are no more than 10 years old. A compilation of Ecoinvent v.3.7.1 and Professional 2021 databases was used.

Comparability




- EPDs within the same product category but from different programs may not be comparable.
- EPDs of construction products may not be comparable if they do not comply with EN 15804.
- This EPD and PCR 2012:01 Construction products and construction services" are available on the website of The International EPD® System (www.environdec.com).



ENVIRONMENTAL PERFORMANCE IMPACT INDICATORS






Parameters describing the environmental impacts

ENVIRONMENTAL IMPACT CATEGORIES		Impact/ 1 kg ISOPIPE TC SOLAR Covering Insulation			
		A1 – Raw Material 	A2 – Transportation 	A3 – Manufacturing 	TOTAL
Global Warming Potential (GWP ₁₀₀)	kg CO ₂ eq.	2.406	0.015	0.256	2.676
Ozone Layer Depletion Potential	kg R11 eq.	2.703E-10	-2.061E-14	1.839E-08	1.866E-08
AcidificationPotential	kg SO ₂ eq.	7.734E-03	1.250E-04	3.908E-04	8.250E-03
EutrophicationPotential	kg PO ₄ ⁻³ eq.	1.769E-03	1.428E-05	6.082E-05	1.844E-03
PhotochemicalOzoneCreationPotential	kg C ₂ H ₄ eq.	8.785E-04	8.408E-06	5.683E-05	9.438E-04
Depletionofabioticresources(elements)	kg Sb eq.	1.339E-03	2.069E-06	2.555E-07	1.341E-03
Depletionofabioticresources(fossil)	MJ net calorific value	63.729	0.199	4.326	68.255

ENVIRONMENTAL PERFORMANCE IMPACT INDICATORS



		Impact/ 1 kg ISOPIPE TC SOLAR Covering Insulation			
		A1 –  Raw Material	A2 –  Transportation	A3 –  Manufacturing	TOTAL
USE OF RESOURCES					
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	4.632	0.011	0.226	4.870
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	-	-	-	-
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	4.632	0.011	0.226	4.870
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	66.068	0.199	4.464	70.730
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	-	-	-	-
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	66.068	0.199	4.464	70.730
Use of secondary material	kg	-	-	-	-
Use of renewable secondary fuels	MJ, net calorific value	-	-	-	-
Use of non-renewable secondary fuels	MJ, net calorific value	-	-	-	-
Use of net fresh water	kg	0.021	1.184E-05	7.865E-04	0.022




ENVIRONMENTAL PERFORMANCE IMPACT INDICATORS



Waste Categories

Hazardous waste disposed	kg
Non-hazardous waste disposed	kg
Radioactive waste disposed	kg

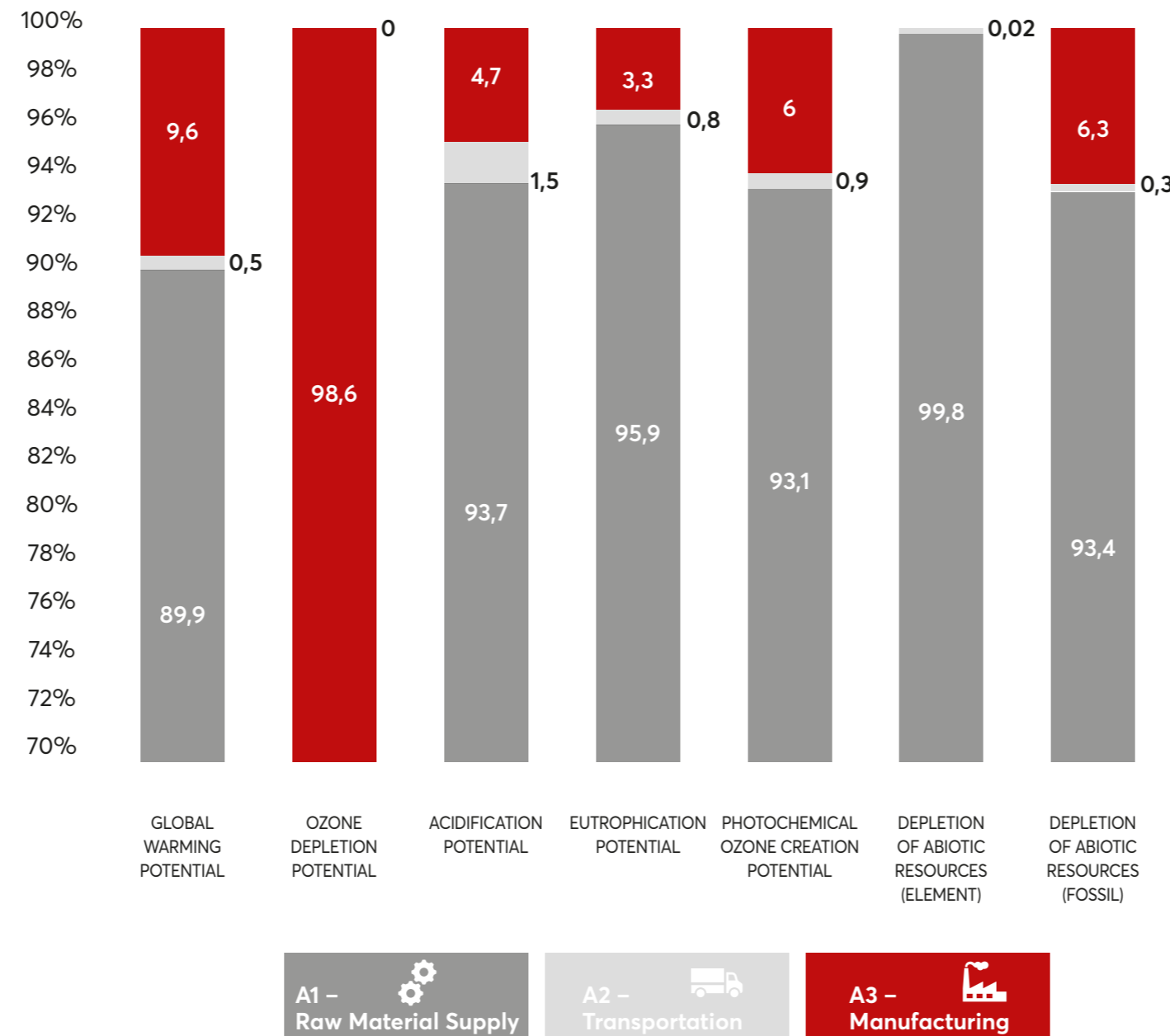
Impact/ 1 kg ISOPIPE TC SOLAR Covering Insulation

A1 –  Raw Material	A2 –  Transportation	A3 –  Manufacturing	TOTAL
2.154E-05	1.727E-09	2.329E-10	2.154E-05
0.011	2.963E-05	9.187E-03	0.020
4.214E-04	1.073E-03	2.564E-05	1.520E-03



INTERPRETATION

The following figure represents the influence of the Life Cycle stages A1, A2, and A3 on the environmental impact indicators formation. It can be clearly noticed that the majority of the analyzed impact categories are mainly influenced by the raw material supply stage (A1).



- ODP is almost exclusively influenced by the manufacturing stage (Module A3).
- The Global Warming Potential (GWP) of 1 kg of TC Solar Covering Insulation is dominated by 89.9% by the production and supply of Raw materials. Module A2 contributes slightly to the impact category. Module A3 has a relatively smaller influence of 9.6% on the formation of the GWP impact.
- Acidification Potential is mainly influenced by Raw material supply stage. More specifically, Module A1 is accounted for the 93.7% of the impact, whereas Module A3 is only responsible for 4.7%.
- A slightly similar pattern is followed regarding the formation of Eutrophication Potential indicator. Contribution of Module A2 is marginal, where Raw material extraction and production stage (A1) has a dominant share of 95.9%.

REFERENCES

- International EPD® System, General Program Instructions for the International EPD System, version 4
- International EPD® System, PCR 2012:01 Construction products and construction services (EN 15804:A1) v.2.34
- International Organization for Standardization (ISO), Environmental labels and declarations – Type III environmental declarations – Principles and procedures. ISO 14025:2006
- EN 15804:2012+A1:2013 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- International Organization for Standardization (ISO), Environmental management – Life Cycle assessment – Principles and framework. ISO 14040:2006
- International Organization for Standardization (ISO), Environmental management – Life Cycle assessment – Requirements and guidelines. ISO 14044:2006
- The International EPD® System – The International EPD System is a programme for type III environmental declarations, maintaining a system to verify and register EPDs as well as keeping a library of EPDs and PCRs in accordance with ISO 14025. www.environdec.com
- EN ISO 14001 – Environmental Management Systems – Requirements
- ISO 14020 – Environmental Labels and Declarations – General Principles o Sphera – GaBi Product Sustainability software – www.sphera.com

