Environmental Product Declaration (EPD)
of a thermal insulation product

in accordance with ISO 14025:2006 and with EN15804:2012+A2:2019

ARMA Finance

CPC 3623 – Tubes, pipes and hoses of vulcanized rubber other than hard rubber
PCR 2019:14: "Construction products" version 1.1 valid until 20/12/2024
C-PCR-005 "Thermal insulation products (EN 16783:2017)"
Geographical area: Europe

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

COMPANY INFORMATION

THE COMPANY

The ARMA FINANCE company studies, designs and produces cut or milled pieces in flexible materials according to your needs, produces insulating supports and sells thermal and acoustic insulators.

Structure aimed at customer needs, branch of an international group, we are a leader in the production and marketing of insulating materials for the thermal and building industry (climate engineering).

ARMA FINANCE is a constantly evolving company!

This declaration refers to a product made in the Polish plant in Uniejów.

PRODUCT INFORMATION

The insulation product is a material that, thanks to particular characteristics, prevents the transmission or diffusion of thermal, acoustic, electrical or other energy, depending on the application for which it is intended. The present LCA study refers to a thermal insulation product distributed by ARMA FINANCE, which is summarized and described below:

- RUBAFLEX is suitable for all applications both civil and industrial that require the use of insulation material, without neglecting the price/quality relationship: refrigeration, air-conditioning, heating and plumbing, tanks, pipe fittings and water ducts;

The following table shows the technical characteristics of the product.

Characteristics of thermal insulation product RUBAFLEX

Property	Value		Standard	
Temperature range	TUBES: from -165°C to +110°C SHEETS: from -165°C* to +85°C		EN 14706 EN 14707	
Thermal conductivity λ W/(m*K)	Thickness ≤ 25mm -20 °C = 0,031 0 °C = 0,033 +20 °C = 0,035 +40 °C = 0,037	Thickness > 25mm -20 °C = 0,034 0 °C = 0,036 +20 °C = 0,038 +40 °C = 0,040	EN 13787 EN ISO 8497	
Corrosion problems	pH neutral (7±0,5)		EN 13468	
Permeability μ	≥ 10000	≥ 7000	EN 12086	
Fire	TUBES: Euroclass B_L - s2, d0 SHEETS: Euroclass B-s3, d0		EN 13501-1	

LCA INFORMATION

DECLARED UNIT

This life cycle analysis, defined as "from-cradle-to-gate with modules C and module D", takes into consideration the production phases of raw materials, their transportation to the production site, the manufacture and the end of life of the product, excluding the distribution and use phase. As regards the flows of matter and energy, declared unit is defined as:

1 m^3 of thermal insulation product, including packaging

The density considered for the product derives from an average of the production of the reference year (2020) and it is 46,5 kg/m^3.

SYSTEM BOUNDARIES

The system boundaries determine the process units to be included in the LCA study and which type of data "input" and / or "output" to the system can be omitted. In accordance with the PCR 2019:14 version 1.1 document and EN 15804, the life cycle of the thermal insulation product made by Salvador Escoda includes the extraction of raw materials and production cycle, transport and manufacturing, divided in the Upstream (A1), Core (A2 and A3) and End of Life (C) and Benefits and loads beyond the system boundary (D) phases. The construction process stage and the use stage (phases from A4 to B7 of PCR 2019:14) are not taken into account in this life cycle analysis.

	LIFE CYCLE INFORMATION																Supplementary information
	Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundary
	A1 – A3			A4 – A5		B1 – B5					B6 – B7		C1 – C4				D
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse, recovery, recycling potential
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Module declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	PL WORLD	EU WORLD	PL										PL	PL	PL	PL	PL
Specific data	>90%																
Variation – products	Not relevant																
Variation – sites	Not relevant																

ND: Module not declared

The **Upstream** (A1) phase includes raw material extraction and processing, and in particular:
- ✓ Extraction and processing of raw materials (e.g. mining processes);
- ✓ Generation of electricity, steam and heat from primary resources, also including their extraction, refining and transport;

The **Core** (A2-A3) phase includes following processes:
- ✓ Transportation up to the factory gate and internal transport (A2);
- ✓ Production of ancillary materials or pre-products (A3);
- ✓ Manufacturing of products and co-products (A3);
- ✓ Manufacturing of packaging (A3);
- ✓ Processing up to the end-of-waste state or disposal of final residues (A3).

The **End of life** (A2-A3) stage includes following processes:
- ✓ De-construction, demolition (C1);
- ✓ Transport to waste processing (C2);
- ✓ Waste processing for reuse, recovery and/or recycling (C3)
- ✓ Disposal (C4).

Module D includes reuse, recovery and/or recycling potentials, expressed as net impacts and benefits.

In the end of life stage, the thermal insulation product is sent exclusively to landfill. As there are no possibilities to separate the insulation product from tanks, pipe fittings, water ducts etc., phase C1 (de-construction and demolition) is irrelevant; moreover, the product is only disposed, so phase C3 (waste treatment for reuse, recovery and / or recycling) is equal to zero. The result of phase D is also equal to zero, because there are no benefits deriving from the end of life (recycling, recovery and / or reuse).

PRODUCTION PROCESS

Weighting out raw materials from the warehouse according to the recipe for the actual production. Mixing weighted out all components in a mixer, and after in a roll mill to complete the mixing of the "Masterbatch". All raw materials are dosed into the mixer and mixed together with "Masterbatch", and after in the ROLLMILL. Small samples are prepared for quality controls. After the cooling down, the Final batch is transported to the extruders area, where the material is extruded according to the shape and size needed. The extruded rubber pass directly into the oven for vulcanization and foaming process. Water bath is used to cool down the expanded rubber that is successively dried in a dedicated tunnel. The last step before packaging is the ink printing and cutting to required lengths. Small samples of finished products are constantly picked-up during the whole production.

Rubaflex ®

SYSTEM DIAGRAM
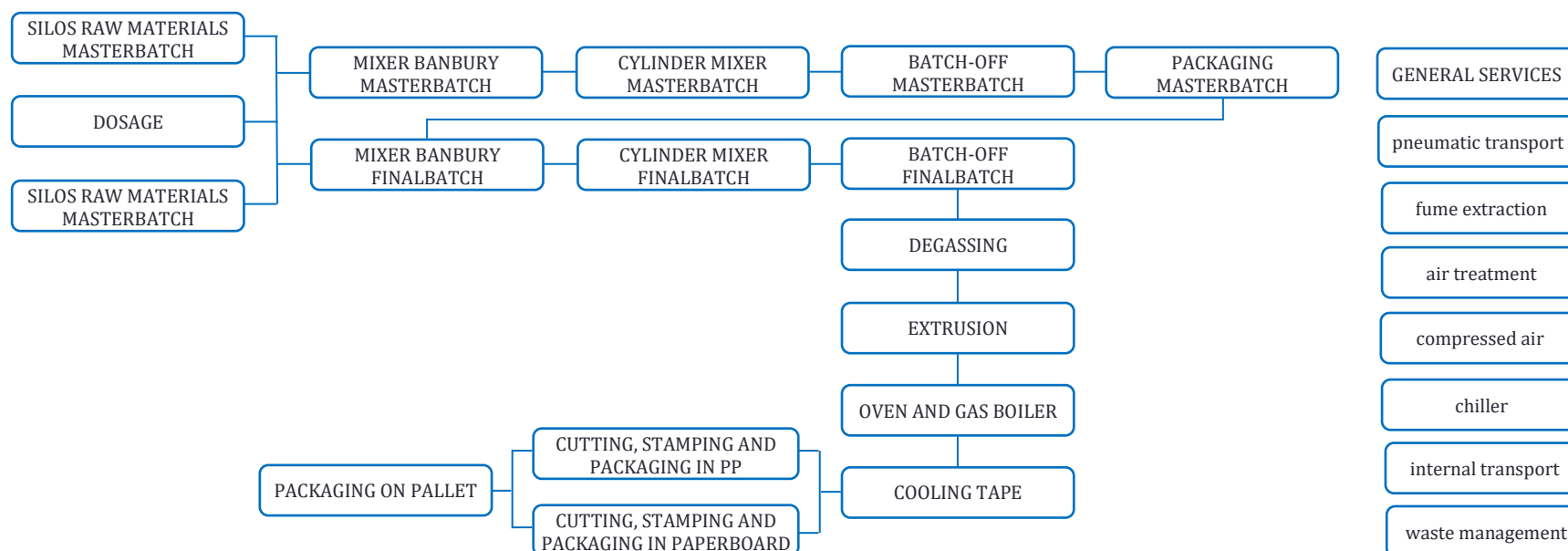
DATA QUALITY AND CUT-OFF

Inventory analysis was conducted using specific data, relating to the year 2020 and to the production site of Uniejów. The data refer to the consumption of raw materials and electricity, the production of the thermal insulation product and the waste connected to it.

Selected generic data from international databases were used (Ecoinvent 3.6) regarding the production processes of raw materials and auxiliary materials used for the production, generation and distribution of electricity, means of transport and waste treatment processes related to the production that takes place in the plant. In addition, data on ground transportation distances were calculated using the Google Maps online calculator and those by sea using the Searates online tool.

The emissions of the upstream electricity used in manifacturing process and modelled as Poland electricity residual mix are 995 g CO_2eq/kWh (AIB 2019).

In accordance with the cut-off rule, packaging of raw material and ancillary were excluded from the assessment.

CONTENT INFORMATION

Content declaration of 1 m³ of thermal insulation product RUBAFLEX

Product	Product components	Weight, kg	%	Post-consumer material, weight-%	Renewable material, weight-%
RUBAFLEX	Polymers	10,0	21,6%	0%	0%
	Fillers	17,6	37,8%	0%	0%
	Plasticizer	9,3	20,1%	0%	0%
	Chemical additive (vulcanization agents)	5,3	11,3%	0%	0%
	Others	4,3	9,2%	0%	0%
	TOTAL	**46,5**	**100%**	**0%**	**0%**
	Packaging components	**Weight, kg**		**Weight-% (versus the product)**	
	Paperboard	7,8		16,8%	
	Pallet	4,6		9,9%	
	TOTAL	**12,4**		**26,7%**	

RUBAFLEX does not contain substances that are listed in the "Candidate List of Substances of Very High Concern for authorisation" in concentrations greater than 0,1%.

ENVIRONMENTAL INFORMATION

In order to reach the results reported below, one of the most widespread application software was used for the evaluation of the product life cycle, namely SimPro 9. Furthermore, the most recent databases on the production of materials, the production cycles in the metallurgical and chemical sector, transports and energy systems were used (Ecoinvent 3.6).

ASSESSMENT METHOD

The assessment methods adopted for the LCA study reported in this EPD are described in EN 15804 annex C "Impact categories and related indicators, methodologies and characterization factors"

Results of environmental impacts of 1 m³ of RUBAFLEX

Potential environmental impacts	Unit	A1	A2	A3	Total A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO_2 eq	2,12E+02	8,71E+00	7,32E+00	**2,29E+02**	0E+00	3,19E-01	0E+00	4,42E+00	0E+00
GWP-biogenic	kg CO_2 eq	2,74E-01	4,56E-04	1,95E-01	**4,69E-01**	0E+00	1,64E-05	0E+00	1,54E-04	0E+00
GWP-luluc	kg CO_2 eq	1,18E-01	7,35E-05	4,52E-02	**1,63E-01**	0E+00	2,54E-06	0E+00	2,89E-05	0E+00
GWP total	kg CO_2 eq	2,13E+02	8,71E+00	7,56E+00	**2,29E+02**	0E+00	3,19E-01	0E+00	4,42E+00	0E+00
ODP	mg CFC-11 eq	4,47E-05	1,99E-06	1,02E-06	**4,77E-05**	0E+00	7,45E-08	0E+00	4,52E-08	0E+00
AP	moli H^+ eq	1,54E+00	8,48E-02	3,59E-02	**1,66E+00**	0E+00	1,11E-03	0E+00	2,26E-03	0E+00
EP-freshwater	kg P eq	1,80E-01	4,57E-05	3,39E-03	**1,84E-01**	0E+00	1,61E-06	0E+00	1,08E-05	0E+00
EP-marine	kg N eq	5,66E-01	2,27E-02	1,31E-02	**6,02E-01**	0E+00	3,57E-04	0E+00	9,89E-02	0E+00
EP-terrestrial	moli N eq	2,51E+00	2,51E-01	1,15E-01	**2,88E+00**	0E+00	3,93E-03	0E+00	1,04E-02	0E+00
POCP	kg NMVOC eq	6,27E-01	6,54E-02	2,89E-02	**7,21E-01**	0E+00	1,07E-03	0E+00	3,96E-03	0E+00
ADP-min&met*	g Sb eq	5,98E-01	4,79E-07	3,38E-05	**5,98E-01**	0E+00	1,90E-08	0E+00	9,93E-08	0E+00
ADP-fossil*	MJ	3,50E+03	1,21E+02	9,61E+01	**3,72E+03**	0E+00	4,54E+00	0E+00	2,76E+00	0E+00
WDP*	m³ eq	1,65E+02	-2,55E-02	2,62E+00	**1,68E+02**	0E+00	-1,01E-03	0E+00	4,46E-03	0E+00

The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Potential environmental impacts – additional indicator	Unit	A1	A2	A3	Total A1-A3	C1	C2	C3	C4	D
GWP-GHG**	kg CO_2 eq	2,13E+02	8,71E+00	7,36E+00	**2,29E+02**	0E+00	3,19E-01	0E+00	4,42E+00	0E+00

* The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.*

GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

Results of use of resources, waste production, output flows of 1 m³ of RUBAFLEX

Use of resources		Unit	A1	A2	A3	Total A1-A3	C1	C2	C3	C4	D
	PERE	MJ	1,25E+02	1,69E-01	7,92E+01	**2,05E+02**	0E+00	6,36E-03	0E+00	3,34E-01	0E+00
	PERM	MJ	2,81E+01	1,11E-01	6,80E+01	**9,62E+01**	0E+00	4,63E-03	0E+00	4,99E-03	0E+00
PERT		MJ	1,53E+02	2,80E-01	1,47E+02	**3,01E+02**	0E+00	1,10E-02	0E+00	3,39E-01	0E+00
	PENRE	MJ	3,17E+03	1,22E+02	1,09E+02	**3,40E+03**	0E+00	4,55E+00	0E+00	3,13E+00	0E+00
	PENRM	MJ	5,62E+02	3,10E-04	6,44E-01	**5,62E+02**	0E+00	1,31E-05	0E+00	2,27E-03	0E+00
PENRT		MJ	3,73E+03	1,22E+02	1,10E+02	**3,97E+03**	0E+00	4,55E+00	0E+00	3,14E+00	0E+00
SM		kg	0E+00	0E+00	7,80E+00	**7,80E+00**	0E+00	0E+00	0E+00	0E+00	0E+00
RSF		MJ	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
NRSF		MJ	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
FW		m³	5,99E+00	2,20E-04	9,97E-02	**6,09E+00**	0E+00	6,82E-06	0E+00	1,08E-03	0E+00

Waste production	Unit	A1	A2	A3	Total A1-A3	C1	C2	C3	C4	D
HW	kg	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**	0E+00	0,00E+00	0E+00	0,00E+00	0E+00
NHW	kg	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**	0E+00	0,00E+00	0E+00	0,00E+00	0E+00
RW	kg	6,25E-03	8,45E-04	7,74E-04	**7,87E-03**	0E+00	3,30E-05	0E+00	2,47E-05	0E+00

Hazardous and non-hazardous waste is only declared if the treatment takes place outside the system boundaries. The amount of radioactive waste comes from the use of nuclear energy in the national electricity production mix of the different countries along the life cycle

Output flows	Unit	A1	A2	A3	Total A1-A3	C1	C2	C3	C4	D
REUSE	kg	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
RECYLE	kg	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
EN-REC	kg	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
EE-EL	MJ	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
EE-ET	MJ	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water; HP = Hazardous waste disposed; NHW = Non-hazardous waste disposed; RW = Radioactive waste disposed; REUSE = Components for reuse; RECYCLE = Materials for recycling; EN-REC = Materials for energy recovery; EE-EL = Exported energy, electricity; EE,TH = Exported energy, thermal

Information on biogenic content of 1 m³ of RUBAFLEX

Biogenic carbon content	Unit	RUBAFLEX
Biogenic carbon content in product	kg	0
Biogenic carbon content in packaging	kg	5,51E+00

ADDITIONAL ENVIRONMENTAL INFORMATION

The company offers a wide range of products that ensure quality, reliability and compliance with market standards. ARMA FINANCE products also play a very important role in conserving the environment by improving the relationship between energy consumption and pollutant emissions, controlling energy consumption and reducing the release of greenhouse gas in the atmosphere.

REFERENCES

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International EPD® system   http://www.environdec.com

Programme information

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The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they not comply with 15804. For further information about comparability, see EN 15804 and ISO 14025.

CEN standard EN 15804 serves as the core Product Category Rules (PCR)
Product category rules (PCR): 2019:14 Construction products, version 1.1; C-PCR-005 Thermal insulation products (EN 16783:2017)
PCR review was conducted by: *The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A Pena, Univerity of Concepcion, -cile. The review panel may be contacted via info@environdec.com.*
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: Guido Croce Approved by: The International EPD® System Technical Committee, supported by the Secretariat
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No