ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A1

Owner of the Declaration	Rockfon (part of ROCKWOOL Group)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-RWI-20200018-CBD3-EN
Issue date	10/03/2020
Valid to	09/03/2025

Rockfon Ceiling Tiles, Baffles, Islands and Wall Applications Rockfon (part of ROCKWOOL Group)



www.ibu-epd.com | https://epd-online.com



General Information

Rockfon (part of ROCKWOOL Group)

Programme holder

IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany

Declaration number EPD-RWI-20200018-CBD3-EN

This declaration is based on the product category rules: Mineral panels, 12.2018 (PCR checked and approved by the SVR)

Issue date 10/03/2020

Valid to

09/03/2025

Man liten

Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)

hand Will

Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.))

Product

Product description/Product definition

Rockfon stone wool acoustic tiles are traditionally made from volcanic rock (typically basalt or dolomite), an increasing proportion of recycled material, and a low percentage of binder (in Rockfon acoustic tiles this is around 3-4%). The essential component of Rockfon tiles are stone wool fibres, which are monofilament synthetic mineral fibres of non-crystalline structure extracted from a silicate melt. The products described in this EPD are produced in the form of tiles in the density range from 70 up to 175 kg/m³. The products are supplied in thicknesses of 12 up to 160 mm. The acoustic tiles can have a glass fibre fleece facing and can be coated with water-based dispersion paint. Details for the environmental impacts of this type of facing can be found on the first page of the annex. The

Rockfon Ceiling tiles

Owner of the declaration

Rockfon (part of ROCKWOOL Group) Hovedgaden 501D 2640, Hedehusene, Denmark

Declared product / declared unit

1 m² of installed ceiling tile.

Scope:

The span of products covered under this declaration is synthetic resin-bonded stone wool materials, which are produced in the form of tiles in the density range from 70 up to 175kg/m³. The products are supplied in thicknesses of 12 up to 160 mm. The declared product in this declaration is Rockfon Arctic with a density of 100kg/m³ and a thickness of 15mm. For the rest of the products scaling factors are provided. For the facing and coating materials, information can be found in the attached Annex.

The products included in this EPD are manufactured in Roermond (Netherlands), Cigacice (Poland), Saint Eloy (France), Vyborg (Russia) and Marshall County, Mississippi (USA). The EPD is based on weighted LCA inventory data from the 5 plants.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of *EN 15804+A1*. In the following, the standard will be simplified as *EN 15804*.

Verification
The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2010
internally x externally
Ind Went

Dr. Frank Werner (Independent verifier appointed by SVR)

additional facing of aluminium laminate may be applicable for some products. The environmental impacts of aluminium laminate are presented on the second page of the annex. Product-specific environmental impacts are compiled by applying the relevant scaling factor (listed in the table below) in the Product Specific Scaling formula.

Product Specific Scaling Formula:

Environmental Impact per m2 product X-with facing = Environmental Impact reference product*scaling factor+Environmental Impact facing material. Please note that the scaling factors give the precise amount of material needed to produce the other product types.



Product Name	Scaling Factor	Product Name	Scaling Factor
Artic (15 mm) -	4.0	Ekla dB 43	4,4
reference product	1,0	Ekla Th 40	1,7
Acoustimass	4,3	Ekla Th 80	3,3
Alaska (20 mm)	2,0	Facett (20 mm)	1,2
Alaska (22 mm)	2,2	Facett (40 mm)	2,4
Alaska dB 35	2,0	Facett (50 mm)	3,0
Artic (20 mm)	1,3	Facett (60 mm)	3,6
Artic (40 mm)	2,7	Facett (80 mm)	4,8
Blanka A (20 mm)	1,2	Facett (100 mm)	6,0
Blanka A (25 mm)	1,5	Facett (120 mm)	7,2
Blanka B/C/D/E/G/M/Z	2.0	Facett (140 mm)	8,4
(20 mm)	2,0	Facett (160 mm)	9,6
Blanka B/C/D/E/G/M/X		Fibral (20 mm)	1,1
(25 mm)	2,5	Fibral (25 mm)	1,3
Blanka X (22 mm)	2,2	Fibral Multiflex Baffle	2,3
Blanka Activity	4,0	Fusion Blanka/Sonar	2,0
Blanka Bas	2.0	Humitec Baffle	2,3
Blanka dB 35	2,0	Hydroclean 12/52	1,1
Blanka dB 41	3,5	Hygienic (20 mm)	1,2
Blanka dB 43	4,4	Hygienic (40 mm)	1,2
Blanka dB 46	5,0	Hygienic Baffle	2,3
Boxer (£ 25 mm)	1,3	Hygienic Plus (20 mm)	1,2
Boxer (40 mm CIG)	2.4	Hygienic Plus (40 mm)	1,9
Boxer (40 mm ROE &	4.0	Industrial Baffle	2,3
SEL)	1,9	Industrial Baffle	2,3
Boxer Wall	2,4	Industrial	2,0
Cinema Black	1,2	Black/Nature/Opal (30	1.4
Color-all (£ 20 mm)	1,2	mm)	.,.
Color-all (25 mm)	1,3	Industrial	
Color-all A (40 mm)	1,9	Black/Nature/Opal (50	2,3
Color-all B (40 mm)	4.0] mm)	_,_
Color-all D/E	2,0	Industrial	
Color-all X	2,2	Black/Nature/Opal (100	3,7
Color-All Wall	1,9	1 mm)	- ,-
Contour	4.0	Industrial	
Cosmos Grey/White		Black/Nature/Opal (100	4,7
(40 mm)	2,7	mm) · ·	
Cosmos Grey/White		Industriebatts (25 mm)	1,2
(50 mm)	3,3	Industriebatts (50 mm)	2,3
Cosmos Grey (60 mm)	4.0	Koral A (15 mm)	0,9
Cosmos Grey (80 mm)	5,3	Koral A (20 mm)	1,2
Cosmos Grey (100		Koral A (40 mm)	1,9
mm)	6,7	Koral E (15 mm)	1,2
Eclipse (incl. Wall)	4,0	Koral E (40 mm) and El	
Ekla (90 kg/m3)	1,2	30	3,2
Ekla (120 kg/m3)	1,6	Koral 100 mm	4,7
Ekla Bas	1,3	Koral Flectoline	1,2
Ekla dB 41	3,5	Koral Tenor (15 mm)	0,9

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration *EN 13964:2014 or EN 13162+A1:2015* and the CE-marking.

For the application and use the respective national provisions apply. They meet the requirements of the regulation (EU) Nr. 1272/2008/EU.

Application

Rockfon products include acoustic ceiling tiles, baffles, islands and wall applications. They are available with different coatings and facings in a variety of shapes, thicknesses, and densities and positively contribute to a healthy indoor environment.

Technical Data

The technical specifications listed below cover the range of all the products declared in this EPD. For information regarding specific products please visit https://www.rockfon.co.uk and access the provided Declarations of Performance (DoP).

Constructional data (acc. to EN 13964)

Name	Value	Unit
Gross density	70 - 175	kg/m ³
Reaction to Fire acc. to EN 13964	A1	
Sound absorption coefficient (aw)	up to 1.00	

Product Name	Scaling Factor	Proc	luct Name	Scaling		
Koral Tenor (25 mm)	1,2	Rockir	idus (30 mm)	Factor 1,4		
Koral Wall	1,9		idus (50 mm)	2,3		
Krios A (20 mm)	1,1	Rock	indus dB 40	3,0		
Krios A (25 mm)	1,3		indus dB 42	4,0		
Krios D (20 mm)	2,0	-	Rocklux	2,2		
Krios D (25 mm)	2,5		hed (50 mm)	2,2		
Krios E (20 mm)	1,6		hed (75 mm)	3,3		
Krios X (22 mm) Krios X (25 mm)	2,2 2,5		A (£ 20 mm) I A (25 mm)	1,1 1,3		
Krios Bas	<u>2,5</u> 1,1		I E (15 mm)	1,3		
Krios O2	1,3		I E (20 mm)	1,6		
Ligna	1,1		Hygiene (20			
Lithos New	1.2	,	mm)	1,1		
Logic	0,8	Royal	Hygiene (40	4.0		
MediCare Air	1,5		mm)	1,9		
MediCare Block	1,3		on (incl. Wall)	2,4		
MediCare Plus A (20	1,2		lar (20 mm)	1,2		
mm)	1,2	Scholar	(incl. Wall) (40	2,4		
MediCare Plus A (25 mm)	1,5	s	mm) ofit New	0,9		
MediCare Plus E (20	1,6	A 10/0/	Sonar			
mm) MediCare Plus X	2,2	A/B/C/L	D/E/G/M/Z (20 mm)	2,0		
MediCare Royal A (20	1,1	Sonar /	VD/E/M/X (25	2,5		
mm) MediCare Royal E (20		Sona	mm) r X (22 mm)	2,2		
mm)	1,6	Sor	ar Activity	4,0		
MediCare Standard (12 mm)	0,8		onar Bas nar Cut-to	2,0 2,5		
MediCare Standard A	0.0		nar dB 35	2,0		
(15 mm)	0,9		nar dB 40	3,0		
MediCare Standard E	1,2	So	nar dB 41	3,5		
(15 mm)	1,2		ar dB 42/43	4,4		
Mono Acoustic Elegant		Sona	ar dB 44/46	5,0		
/ Ready-Mix (incl.	3,6		dstop 30 dB	4,4		
Direct and Flecto)	2.2		dstop 21 dB	3,0		
Opal Multiflex Baffle Pacific	2,3	Soun	dstop 33 dB	4,8		
Pagos Galaxie / Oris	1,0 1,1	Tabl	Swing	1,6		
Pallas	1,1		que Plenum	3,7		
Pallas HP	1,3		c A (15 mm) c A (20 mm)	1,4		
Plafolaine Feu	2,0		c A (40 mm)	1,4		
Plafolaine Feu	3,6		c E (15 mm)	1,2		
Rockbaffle Deco	1,7		c E (20 mm)	1,6		
Rockfon Metal	0,9		pic dB 42	4,4		
Rockfon Metal dB 41	3,0		ersal Baffle	2,3		
Rockfon Metal dB 44	4,0		VertiQ	3,2		
Rockfon Metal dB 46	5,0	Ve	rtiQ Metal	1,7		
acc. to EN 13964						
Susceptibility to th	e growth o	f	A+			
harmful micro-orga			A - not			
dampness acc. to			susceptible	÷		
Thermal conductiv	vity acc. to	EN	0.04	W/(mK)		
13964 Susceptibility to th	e arowth a	f		+ ` '		
	•		•			
harmful micro-orga			A			
thermal insulation	acc. to EN	13964		_		
Durability acc. to E	EN 13964		Class			
			1/C/0N			
Sound absorption	CIASS		A			
Light reflection	up to 87%	%				
Light diffusion			up to >99%	%		
			-			
			up to 100%			
Humidity and sag		RH and no	%			
i annaity and odg			visible	,0		
			deflection			
Airborne sound re	duction ac	c to				
			up to 42	dB		
EN ISO 10848-2 and EN ISO 717-1 40 10 42 40						

Performance data of the Rockfon stone wool products are in accordance with the declaration of performance with respect to its essential characteristics according to *EN 13964:2014.*

Emission tests according to *EN 16516:2018* are available from national technical managers.



Base materials/Ancillary materials

Composition Rockfon stone wool product:

- non-scarce natural stone and cement [59%]
- slags and other secondary materials or waste materials [19,5%]
- mineral oil and bonding agent [<0,2%]
- binder, a thermoset inert polymer resin [5%]
- Non-woven glass wool facing (optional) [1-15%]
- water-based paints [0-16,5%]

Packaging represents less than 6% of the final product delivered to the customer. The raw materials are nonscarce natural stones, secondary materials and briquettes, which are made of mineral wool waste, secondary materials and by-products from other industries such as slags and cement. The binder is a thermoset inert polymer resin which is polymerized into a solid resin during the production of the final stone wool product. The coating is a waterborne acrylic coating and an additional (optional) polyurethane (PU) coating.

This product/article/at least one partial article contains substances listed in the candidate list (*ECHA PR/19/12*) (date: 16.07.2019) exceeding 0.1 percentage by mass: **no**

Mineral wool fibres produced by ROCKWOOL are classified as non-hazardous under REACH (Regulation (EC) No 1272/2008 of the European Parliament and of the council of 16 December 2008 on classification, labelling and packaging of substances and mixtures). ROCKWOOL stone wool is registered with REACH under the following definition: "Man-made vitreous (silicate) fibres with random orientation with alkaline oxide and alkali earth oxide

LCA: Calculation rules

Declared Unit

The declared unit refers to 1 m² of installed acoustic ceiling tile or wall panel (within the density range 70 – 175 kg/m³) with the results being representative for a 15 mm thick and 1,5 kg/m² heavy product. This weight per m² is applicable for the stone wool core without the facing. The declared product is Rockfon Arctic with a density of 100kg/m³ and a thickness of 15 mm.

Declared unit

Name	Value	Unit
Declared unit	1	m ²
Grammage	1.5	kg/m ²
Thickness of the panels	15	mm
Conversion factor to 1 kg	0.667	-

System boundary

EPD type: Cradle to gate with options, modules C1–C4, and module D.

The modules considered in the life cycle assessment as per system boundaries are described as follows:

Production

The product stage A1-A3 includes:

 Provision of preliminary products and energy and relevant upstream processes; $(Na_2O+K_2O+CaO+MgO+BaO)$ content greater than 18% by weight and fulfilling one of the Note Q conditions". ROCKWOOL products produced in Europe fulfil the Note Q requirements. This is certified by the independent certification body EUCEB. (European Certification Board for mineral wool products). More information on EUCEB can be found under www.euceb.org.

Reference service life

A reference service life according to *ISO* 15686 is not declared for this EPD. Instead, a service life is declared according to *BBSR table*. According to this table, mineral panels have a service life of more than 50 years in a building. For this EPD the declared value is therefore 50 years.

This is the service life that is used in most existing PCRs and EPDs in the Dutch, German, US and Canadian markets. The mineral wool core in Rockfon products is tested to maintain its properties for at least 50 years. Also, Rockfon products are tested to maintain flatness even in high temperature/ high humidity environments (40°C / 95 % relative humidity). Given this, there is no doubt that Rockfon ceiling tiles could have a technical lifespan of more than 50 years in a normal indoor environment. Some owners will replace the Rockfon product due to renovations or aesthetics, but not for functional performance reasons. Replacements typically do not happen due to technical failure but are more likely the result of vandalism, accidents, visual appearance, minor refurbishments (e.g. painting an office, changing of tenants) or major refurbishments.

- Transporting the raw materials and preliminary materials to ROCKWOOL production facilities;
- Production process in the ROCKWOOL production facilities including energy inputs and emissions;
- Electricity consumption;
- Waste processing up to the end-of-waste state or disposal of waste residues, during the production stage;
- Production of packaging material;
- Manufacturing of products and co-product.

The environmental impact of co-products coming for example from the steel and electricity plants (e.g. slags, alumina and ashes entering the system as inputs to the manufacturing) is accounted for and economic allocation is applied.

Recycled stone wool comes free of environmental burden, as it enters the product system as waste. Its transport to the factory is accounted for. Modules A1, A2 and A3 are declared as an aggregated module A1-A3.

In two of the factories (Cigacice in Poland and Roermond in the Netherlands) we obtain Renewable Energy Certificates for the complete electricity



consumption. For that purpose the electricity in those factories is modelled as renewable electricity.

Construction/Installation

The Construction Stage A4-A5 includes:

- A4 transport to the building site
- A5 installation to the building

The transport in A4 is modelled based on the amount of tiles that fit in a truck that can hold 44 pallets. The values are based on annual average delivery data. In A5 the default installation is assumed to be manual, therefore no energy consumption or ancillary equipment is needed.

The product waste from installation is assumed to be 7% and according to the modularity principle of *EN 15804*, its impacts are fully allocated to A5. The 7% assumption is used based on the "common scenarios for LCA" internal document from EURIMA (European Insulation Manufacturers Association) but can, in reality, be significantly lower.

The A5 stage, according to *EN 15804* includes also waste processing up to the end-of-waste state or disposal of final residues during the construction process stage and impacts and aspects related to product losses during installation. Finally, the A5 module includes also the corresponding end-of-life considerations for packaging. The assumption for installation waste for this calculation is that it is 100% landfilled but it often also is 100% closed-loop recycled through the Rockfon recycling service offering.

Building Use

The use-stage B1-B7, related to the building fabric includes:

- B1 use or application of the installed product not part of this EPD;
- B2 maintenance;

- B3 repair;
- B4 replacement;
- B5 refurbishment;
- B6 Operational energy use:
- B7 Operational water use:

Rockfon stone wool ceiling tiles are installed permanently in the structure and do not require maintenance, repair, replacement or refurbishment under normal use conditions. Similarly, Rockfon has no operational energy or water use.

End of Life

The End-of-life stage C1-C4 includes:

- C1 de-construction, demolition;
- C2 transport to waste processing;
- C3 waste processing for reuse, recovery and/or recycling;
- C4 disposal.

These stages also include the provision and all transport, provision of all materials, products and related energy and water use. Manual deconstruction is assumed for C1 and no impacts are assigned. The benefits from disposal (heat or electricity recovery) are assigned to module D.

Module D includes reuse, recovery and/or recycling potentials expressed as net loads and benefits. Here the loads from the packaging disposal in A5 and from electricity generation on landfill are considered.

The product system with the system boundaries is presented in the graph below:





Comparability

Basically, 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. The used background datasets and database version have to be mentioned since they can have an influence on the final results. The used software for the development of the declaration was *GaBi*, version 8.0.1.257 by thinkstep.

LCA: Scenarios and additional technical information

The following technical information for the declared modules can be used for scenario development in a building context.

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel	38	l/100km
Transport distance	646	km
Capacity utilisation (including empty runs)	85	%
Gross density of products transported	100	kg/m³

Installation into the building (A5)

Name	Value	Unit
Electricity consumption	0	kWh
Material loss	7	%

Reference service life

Name	Value	Unit
Life Span (according to BBSR)	> 50	а

End of life (C1-C4)

Name	Value	Unit
Landfilling	15	kg
Transport to landfill	50	km
Utilization rate	50	%

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Any declared benefits and loads from net flows leaving the product system that have not been allocated as coproducts and that have passed the end-of-waste state are included in module D. Such declared benefits can occur in stages A5 and C4. The generated energy, such as heat and electricity from waste incineration of packaging is assigned to module D. The benefits are calculated using current average substitution processes. The heat is credited for with heat from natural gas. The electricity is credited for with the specific country's electricity mix. This is also applied for materials that are landfilled as the benefits from electricity production from landfill gas recovery are included in module D.



LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED;

MNR	= MO	DULE	NOT F	RELE\	/ANT)												
PROE	DUCT S	STAGE	CONST ON PRO STA	DCESS	DESS USE STAGE END OF LIFE STAGE			BENEFITS A LOADS END OF LIFE STAGE BEYOND T SYSTEM BOUNDAR				OADS OND THE YSTEM					
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction	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
Х	Х	X	X	Х	MND	X	MNR	MNR	MNR	Х	X	X	X	X	Х		Х
RESL tile	ILTS	OF TH	IE LCA	- EN	/IRON	IMEN	TAL IM	PACT	acco	rding t	o EN	1580	4+A1: 1	m² of	Rockf	on c	eiling
Para	meter		Unit	A1-A	3 /	44	A5	B2	в	6	B7	C1	C2	C3	;	C4	D
	WP		CO ₂ -Eq.]	1.32E-			2.58E-1	0.00E+0			0E+0	0.00E+				16E-2	-6.97E-2
	DP \P		<u>=C11-Eq.]</u> SO ₂ -Eq.]	2.65E			.94E-10 5.81E-4	0.00E+0			0E+0 0E+0	0.00E+				6E-16 30E-4	-1.34E-14 -1.85E-4
	EP		<u>,902-Eq.]</u> 'O₄) ³ -Eq.]	1.17E			1.02E-4	0.00E+0			0E+0	0.00E+				47E-5	-1.80E-5
	CP		hene-Eq.]	5.45E			4.50E-5	0.00E+0	_		0E+0	0.00E+				96E-6	-1.79E-5
L	DPE DPF		Sb-Eq.] [MJ]	5.26E			3.55E-8 .40E+0	0.00E+0			0E+0 0E+0	0.00E+				96E-9 03E-1	-2.12E-8 -1.42E+0
Captio		P = Glob	al warmin	g potent	ial; ODP P = Form	= Deple	tion poter tential of t	ntial of the	e stratos eric ozo	spheric oz ne photoc	one lay	er; AP = I oxidan		on potenti	al of land	d and v	vater; EP = ial for non-
RESL	JLTS	OF TH	IE LCA	- RE	SOUR	CE US	E acc	ording	to E	N 1580	4+A1	: 1 m²	² of Roc	kfon c	eiling	tile	
Param	eter	Unit	A1-A3	A4		A5	B2	E	6	B7	c	1	C2	C3	c	4	D
PER			3.40E+0	1.75E		05E+0	0.00E+0)E+0	0.00E+0	0.00		3.79E-3	0.00E+0			-2.06E-1
PER			2.20E+0 5.60E+0	0.00E		63E+0 .22E-1	0.00E+0)E+0)E+0	0.00E+0 0.00E+0	0.00		0.00E+0 3.79E-3	0.00E+0 0.00E+0			0.00E+0 -2.06E-1
PENF			1.53E+0	3.02E		58E+0	0.00E+0)E+0	0.00E+0	0.00		6.53E-2	0.00E+0			-1.53E+0
PENF			2.27E+0	0.00E		27E-2	0.00E+0)E+0	0.00E+0	0.00		0.00E+0	0.00E+0			0.00E+0
PENF SM			1.76E+0 0.00E+0	3.02E		56E+0 00E+0	0.00E+0)E+0)E+0	0.00E+0 0.00E+0	0.00		6.53E-2 0.00E+0	0.00E+0 0.00E+0			-1.53E+0 0.00E+0
RSF			0.00E+0	0.00E	+0 0.	00E+0	0.00E+0)E+0	0.00E+0	0.00		0.00E+0	0.00E+0			0.00E+0
NRS			0.00E+0	0.00E		00E+0	0.00E+0)E+0	0.00E+0	0.00		0.00E+0	0.00E+0			0.00E+0
Captio	FW [m³] 6.19E-3 2.96E-4 8.11E-4 0.00E+0 0.00E+0 0.00E+0 6.40E-6 0.00E+0 7.90E-5 -4.23E-4 PERE = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = 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 resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of not fresh water																
			IE LCA ceiling		TPUT	FLOV	VS AN	D WAS	STE C	ATEG	ORIE	s acc	ording	to EN 1	5804-	FA1:	
Param		Unit	A1-A3	A4		A5	B2		6	B7	c		C2	C3	c		D
		[kg]	3.59E-7	1.68E		.77E-8	0.00E+()E+0	0.00E+0	0.00		3.65E-9	0.00E+0			-1.70E-9
NHW RWI		[kg] [kg]	1.20E-1 7.41E-4	2.45E		.17E-1 .91E-5	0.00E+0)E+0)E+0	0.00E+0 0.00E+0	0.00		5.31E-6 8.86E-8	0.00E+0 0.00E+0			-8.99E-4 -2.70E-5
CRL	J	[kg]	0.00E+0	0.00E	+0 0.	00E+0	0.00E+0	0.00)E+0	0.00E+0	0.00	E+0	0.00E+0	0.00E+0	0.00	E+0	0.00E+0
MFF			0.00E+0 0.00E+0	0.00E		.42E-2 00E+0	0.00E+0)E+0)E+0	0.00E+0 0.00E+0	0.00		0.00E+0 0.00E+0	4.05E-2 0.00E+0			0.00E+0 0.00E+0
EEE			0.00E+0	0.00L		.53E-1	0.00E+0)E+0	0.00E+0	0.00		0.00E+0	0.00E+0			0.00E+0
EET			0.00E+0	0.00E		.60E-1	0.00E+()E+0	0.00E+0	0.00		0.00E+0	0.00E+0			0.00E+0
Captio	Caption HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy																

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Annex

For the following facing options, applicable to Rockfon ceiling tiles:

- Glass fibre fleece and dispersion paint (applicable to all Rockfon products in this EPD)
- Aluminium laminate facing

to the

ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

Owner of the Declaration	ROCKWOOL International A/S (ROCKWOOL Nordics)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-RWI-20200018-CBD1-EN
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Rockfon Ceiling Tiles, Baffles, Islands and Wall Applications Rockfon (part of ROCKWOOL Group)



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LCA: Results for the facing options

The LCA approach for the facings options follows the general methodology and assumptions from ROCKWOOL International, as these are explained in the background methodology report and have been verified and approved. This Annex is not a stand-alone document and it is used as a supplementary file to the verified EPD for Rockfon ceiling tiles, Baffles, Islands and Wall Applications.

Below the impact assessment results and life cycle indicators are presented, for all the facing options that can be available in a Rockfon ceiling tile. If the provided product has the specific facing, its final impact result is given by adding the result of the product, as calculated above, and the result of the specific facing option. Both results are expressed per m² therefore no additional conversion is needed, the final result is given by the formula:

Environmental Impact per m² product X-with facing = Environmental Impact product X without facing + Environmental Impact facing material

The disposal scenario in the end orf lie is assumed to be landfill for all the options. The first facing option is applicable to all the Rockfon products while the second is optional and applicable only to some.

DESC			OF THE	SYS	ТЕМ В	OUNE	DARY (X = IN	CLU	DED IN	LCA:	MND =	MOD	ULE		CL	ARED)
	SCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE								BEN	EFITS AND LOADS							
PRODUCT STAGE ON PROCESS					USE STAGE						END OF LIFE STAGE				BE	YOND THE	
STAGE																SYSTEM UNDARIES	
Raw material supply	Transport	Transport Manufacturing Transport from the gate to the site Assembly		Use	Maintenance	Repair	Replacement	Refurbishment	onal energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-	Recovery- Recycling- potential	
Raw s	Tra	Manu	Transp gate i	As		Mair	Ľ.	Repl	Refur	Operational use	Operat	De-co der	Tra	Waste	Di	R	PC &
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
Х	Х	Х	Х	Х	Х	MND	MNR	MNR	MNR	MND	MND	Х	Х	Х	Х		Х
RESU	JLTS	OF TH	HE LCA	- EN	VIRON	MEN.	TAL IN	IPACT	: 1 m	² Glass	Fleed	e and I	Paint				
Param eter	ι	Unit	A1-A	3	A4		A5	B1	1	C1		C2	C	3	C4		D
GWP		CO ₂ -Eq.]	-]	E-01	3,50E	-	1,04E-0)E+00	0,00E-		5,41E-03	,	DE+00	8,20E		0,00E+00
ODP AP		<u>-C11-Eq.]</u> 3O ₂ -Eq.]	- /	E+00 E-03	5,80E 3,00E	-	5,70E-1 2,91E-04	- ,)E+00)E+00	0,00E- 0,00E-		8,87E-19 4,65E-06	,	DE+00 DE+00	4,70E 4,90E		0,00E+00 0,00E+00
EP	[kg (PO ₄) ³ -Eq.] 3,10E-0			6,50E-06		, ,)E+00	0,00E+00		1,03E-06		DE+00	5,60E		0,00E+00	
POCP	[kg eth	hene-Eq.]		E-04	1,11E	-07	2,51E-0	5 0,00)E+00	0,00E-	+00 -	2,20E-08	0,00)E+00	3,74E	-06	0,00E+00
ADPE		Sb-Eq.]	/	E-05	2,71E		7,78E-0)E+00	0,00E-		4,16E-10		DE+00	3,04E		0,00E+00
ADPF		[MJ]	,	E+01	4,70E		1,18E+0)E+00	0,00E-		7,29E-02		DE+00	1,15E		0,00E+00 water; EP =
Captio	n Eut	trophicatio	on potentia	al; POC						one photoc				Abiotic	depletion	poter	ntial for non-
RESU	JLTS	OF TH	HE LCA	- RE			,			pletion pot ece an			ources				
RESU Param		OF TH Unit	HE LCA A1-A3	- RE		CE US	,				d Pair		C3	;	C4		D
Param PER	eter	Unit [MJ]	A1-A3 2,56E+	-00	ESOUR A4 2,80E-0	CE US	SE: 1 n A5 6E-01	n ² Glas B1 0,00E+	oo	ece an C1 0,00E+	d Pair	nt C2 ,26E-03	C3 0,00)E+00	1,51E-		0,00E+00
Param PER PER	eter E M	Unit [MJ] [MJ]	A1-A3 2,56E+ 0,00E+	-00	A4 2,80E-0 0,00E+0	CE US 2 1,80 0 0,00	SE: 1 n A5 6E-01 0E+00	n ² Glas B1 0,00E+ 0,00E+	00 00	ece an C1 0,00E+ 0,00E+	00 4 00 0	C2 ,26E-03 ,00E+00	C3 0,00 0,00)E+00)E+00	1,51E- 0,00E+	-00	0,00E+00 0,00E+00
Param PER PER PER	eter E M T	Unit [MJ] [MJ] [MJ]	A1-A3 2,56E+ 0,00E+ 2,56E+	-00 -00 -00	A4 2,80E-0 0,00E+0 2,80E-0	2 1,80 0 0,00 2 1,80	SE: 1 n A5 SE-01 DE+00 SE-01	n ² Glas B1 0,00E+ 0,00E+ 0,00E+	00 00 00	C1 0,00E+ 0,00E+ 0,00E+	d Pair 00 4 00 0 00 4	C2 ,26E-03 ,00E+00 ,26E-03	C3 0,00 0,00 0,00)E+00)E+00)E+00	1,51E- 0,00E+ 1,51E-	-00 -02	0,00E+00 0,00E+00 0,00E+00
Param PER PER	eter E M CT RE	Unit [MJ] [MJ]	A1-A3 2,56E+ 0,00E+	-00 -00 -00 -01	A4 2,80E-0 0,00E+0	CE US 2 1,80 0 0,00 2 1,80 1 1,27	SE: 1 n A5 6E-01 0E+00	n ² Glas B1 0,00E+ 0,00E+	00 00 00 00 00	ece an C1 0,00E+ 0,00E+	00 4 00 0 00 4 00 7	C2 ,26E-03 ,00E+00	C3 0,00 0,00 0,00 0,00)E+00)E+00	1,51E- 0,00E+	-00 -02 -01	0,00E+00 0,00E+00
Param PER PER PENF PENF PENF	eter M M T RE RE RM RT	Unit [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1-A3 2,56E+ 0,00E+ 2,56E+ 1,71E+ 0,00E+ 1,71E+	-00 -00 -00 -01 -00 -00 -01	A4 2,80E-0 0,00E+0 2,80E-0 4,70E-0 0,00E+0 4,70E-0 4,70E-0	CE US 2 1,86 0 0,00 2 1,86 1 1,27 0 0,00 1 1,27	A5 5E-01 5E-01 5E-01 5E-01 7E+00 5E+00 7E+00 7E+00	n ² Glas B1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+	00 00 00 00 00 00 00 00	C1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+	d Pair 00 4 00 0 00 4 00 7 00 0 00 7 00 7	1t C2 ,26E-03 ,00E+00 ,26E-03 7,37E-02 ,00E+00 7,37E-02	C3 0,00 0,00 0,00 0,00 0,00 0,00	DE+00 DE+00 DE+00 DE+00 DE+00 DE+00 DE+00	1,51E- 0,00E+ 1,51E- 1,18E- 0,00E+ 1,18E-	-00 -02 -01 -00 -01	0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00
Param PER PER PENF PENF PENF SM	eter M CT RE RE RM RT I	Unit [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1-A3 2,56E+ 0,00E+ 2,56E+ 1,71E+ 0,00E+ 1,71E+ 0,00E+	-00 -00 -00 -01 -00 -01 -01 -00	A4 2,80E-0 0,00E+0 2,80E-0 4,70E-0 0,00E+0 4,70E-0 0,00E+0 0,00E+0	CEUS 2 1,86 0 0,00 2 1,86 1 1,27 0 0,00 1 1,27 0 0,00	A5 5E-01 5E-01 5E-01 5E-01 7E+00 5E+00 7E+00 7E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+0	n ² Glas B1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+	00 00 00 00 00 00 00 00 00	C1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+	OD 4 00 4 00 0 00 7 00 0 00 7 00 0 00 7 00 0 00 7 00 0	1 C2 ,26E-03 ,00E+00 ,26E-03 ,37E-02 ,00E+00 ,37E-02 ,00E+00	C3 0,00 0,00 0,00 0,00 0,00 0,00 0,00	DE+00 DE+00 DE+00 DE+00 DE+00 DE+00 DE+00 DE+00	1,51E- 0,00E+ 1,51E- 1,18E- 0,00E+ 1,18E- 0,00E+	-00 -02 -01 -00 -01 -00	0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00
Param PER PER PENF PENF PENF SM RSF	eter	Unit [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1-A3 2,56E+ 0,00E+ 2,56E+ 1,71E+ 0,00E+ 1,71E+ 0,00E+ 0,00E+	-00 -00 -00 -01 -01 -01 -00 -00 -00	A4 2,80E-0 0,00E+0 2,80E-0 4,70E-0 0,00E+0 0,00E+0 0,00E+0	CEUS 2 1,86 0 0,00 2 1,86 1 1,27 0 0,00 1 1,27 0 0,00 0 0,00	A5 SE-01 DE+00 SE-01 ZE-01 ZE-01 ZE-01 ZE+00 DE+00 ZE+00 DE+00 ZE+00 DE+00 ZE+00 DE+00 DE+00 DE+00 DE+00	n ² Glas B1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+	00 00 00 00 00 00 00 00 00 00 00	C1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+	OO 4 00 0 00 0 00 0 00 7 00 0 00 7 00 0 00 7 00 0 00 0	1t C2 ,26E-03 ,00E+00 ,26E-03 ,37E-02 ,00E+00 ,37E-02 ,00E+00 ,00E+00 ,00E+00	C3 0,00 0,00 0,00 0,00 0,00 0,00 0,00	DE+00 DE+00 DE+00 DE+00 DE+00 DE+00 DE+00 DE+00 DE+00	1,51E- 0,00E+ 1,51E- 1,18E- 0,00E+ 1,18E- 0,00E+ 0,00E+	-00 -02 -01 -00 -00 -00	0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00
Param PER PER PENF PENF PENF SM	eter	Unit [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1-A3 2,56E+ 0,00E+ 2,56E+ 1,71E+ 0,00E+ 1,71E+ 0,00E+	-00 -00 -00 -01 -00 -01 -00 -00 -00	A4 2,80E-0 0,00E+0 2,80E-0 4,70E-0 0,00E+0 4,70E-0 0,00E+0 0,00E+0	CEUS 2 1,86 0 0,00 2 1,88 1 1,27 0 0,00 1 1,27 0 0,00 0 0,00 0 0,00 0 0,00	A5 5E-01 5E-01 5E-01 5E-01 7E+00 5E+00 7E+00 7E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+00 5E+0	n ² Glas B1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+	00 00 00 00 00 00 00 00 00 00 00 00	C1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+	Image: definition of the second sec	1 C2 ,26E-03 ,00E+00 ,26E-03 ,37E-02 ,00E+00 ,37E-02 ,00E+00	C3 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,	DE+00 DE+00 DE+00 DE+00 DE+00 DE+00 DE+00 DE+00	1,51E- 0,00E+ 1,51E- 1,18E- 0,00E+ 1,18E- 0,00E+	-00 -02 -01 -00 -01 -00 -00 -00	0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00
Param PER PER PENF PENF PENF SM RSF NRS FW Captio	eter M M RT RE RT RT RT RT F F F P P n F resc	Unit [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1-A3 2,56E+ 0,00E+ 2,56E+ 1,71E+ 0,00E+ 0,00E+ 0,00E+ 4,21E Jse of rence ergy resonergy excl ied as raw	-00 -00 -00 -01 -00 -00 -00 -00 -00 -00	A4 2,80E-0 0,00E+0 2,80E-0 4,70E-0 0,00E+0 4,70E-0 0,00E+0 1,70E-0 0,00E+0 1,70	2 1,86 0 0,00 2 1,86 1 1,27 0 0,00 1 1,27 0 0,00 0 0,000 0 0,0000 0 0,000 0 0,0000 0 0,0000 0 0,0000 0 0,0000 0 0,00000000	A5 BE-01 DE+00 DE+01 DE+02 DE+03 DE+04 Icluding realized aluse of response of r	n ² Glas B1 0,00E+ 0,0	00 00 00 00 00 00 00 00 00 00 00 00 00	C1 0,00E+	d Pair 00 4 00 0 00 4 00 0 00 7 00 0 00	1t C2 4,26E-03 ,37E-02 ,00E+00 ,37E-02 ,00E+00 ,00	C3 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,	DE+00 DE+00 </td <td>1,51E- 0,00E+ 1,51E- 1,18E- 0,00E+ 1,18E- 0,00E+ 0,00E+ 3,00E- 3,00E- ERM = Usi ERM = Usi ERM = Usi E = Use of newable p dary mate</td> <td>-00 -02 -01 -00 -00 -00 -00 -00 -00 -05 -05 -05 -00 -05 -05</td> <td>0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 enewable renewable</td>	1,51E- 0,00E+ 1,51E- 1,18E- 0,00E+ 1,18E- 0,00E+ 0,00E+ 3,00E- 3,00E- ERM = Usi ERM = Usi ERM = Usi E = Use of newable p dary mate	-00 -02 -01 -00 -00 -00 -00 -00 -00 -05 -05 -05 -00 -05 -05	0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 enewable renewable
Param PER PER PENI PENI SM RSI RSI RSI RSI RSI RSI RSI	eter M M RT RE RT RT F SF C D F F C D D F F C D D F F C C C C C	Unit [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] PERE = L primary er primary er pources us OF Th	A1-A3 2,56E+ 0,00E+ 2,56E+ 1,71E+ 0,00E+ 0,00E+ 0,00E+ 4,21E Jse of rence ergy resonergy excl ied as raw	-00 -00 -00 -01 -00 -01 -00 -00 -00 -00	A4 2,80E-0 0,00E+0 2,80E-0 4,70E-0 0,00E+0 4,70E-0 0,00E+0 1,70E-0 0,00	2 1,86 0 0,00 2 1,86 1 1,27 0 0,00 1 1,27 0 0,00 0 0,000 0 0,0000 0 0,000 0 0,0000 0 0,0000 0 0,0000 0 0,0000 0 0,00000000	A5 BE-01 DE+00 DE+01 DE+02 DE+03 DE+04 Icluding realized aluse of response of r	n ² Glas B1 0,00E+ 0,0	00 00 00 00 00 00 00 00 00 00 00 00 00	C1 0,00E+ 0,	d Pair 00 4 00 0 00 4 00 0 00 7 00 0 00	1t C2 4,26E-03 ,37E-02 ,00E+00 ,37E-02 ,00E+00 ,00	C3 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,	DE+00 DE+00 </td <td>1,51E- 0,00E+ 1,51E- 1,18E- 0,00E+ 1,18E- 0,00E+ 0,00E+ 3,00E- 3,00E- ERM = Usi ERM = Usi ERM = Usi E = Use of newable p dary mate</td> <td>-00 -02 -01 -00 -00 -00 -00 -00 -00 -05 -05 -05 -00 -05 -05</td> <td>0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 enewable renewable ry energy</td>	1,51E- 0,00E+ 1,51E- 1,18E- 0,00E+ 1,18E- 0,00E+ 0,00E+ 3,00E- 3,00E- ERM = Usi ERM = Usi ERM = Usi E = Use of newable p dary mate	-00 -02 -01 -00 -00 -00 -00 -00 -00 -05 -05 -05 -00 -05 -05	0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 enewable renewable ry energy
Param PER PER PENF PENF PENF SM RSI NRS FW Captio	eter	Unit [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] PERE = L primary er primary er pources us OF Th	A1-A3 2,56E- 0,00E- 2,56E- 1,71E- 0,00E- 1,71E- 0,00E- 1,71E- 0,00E- 0,00E- 0,00E- 1,71E- 1,71E- 0,00E- 1,71E- 1,7	00 00 00 00 00 00 00 00 00 00 00 00 00	SOUR A4 2,80E-0 0,00E+0 2,80E-0 4,70E-0 0,00E+0 0,00E+0	2 1,80 0 0,00 2 1,80 1 1,27 0 0,00 0 0,00 0 0,00 0 0,00 0 0,00 5 3,99 mergy ex- margy ex- margy ex- margy fuels: FLOV	SE:1 n A5 SE-01 SE-01 SE-01 SE-01 SE-01 VE +00 SE-01 VE +00 SE-01 VE +00 SE-01 DE+00 SE-01 DE+00 SE-01 DE+00 SE-00 IE-04 SE-00 IE-04 NRSF = WS AN A5	n ² Glas B1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ T = Total gy resou 00n-renev Use of n n D WAS B1	S FIe 00 00 00 <	C1 0,00E+	d Pair 00 4 00 0 00 4 00 7 00 0 00 7 00 0 00 0 0 00 0 00 0 0	1t C2 ,26E-03 ,00E+00 ,26E-03 ,37E-02 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,20E-06 ,20E-06 s; PENRM urces; SM els; FW = C2	C3 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,	DE +00 DE	1,51E- 0,00E+ 1,51E- 1,18E- 0,00E+ 0,00E+ 0,00E+ 3,00E- ERM = Use i = Use of newable p dary mater h water	-00 -02 -01 -00 -00 -00 -00 -00 -00 -00 -00 -00	0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 enewable renewable ry energy SSF = Use of
Param PER PER PENF PENF SM RSI NRS FW Captio	eter E M M T T R R R R R R R R R R R R R	Unit [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1-A3 2,56E- 0,00E- 2,56E- 1,71E- 0,00E- 1,71E- 0,00E- 1,71E- 0,00E- 4,21E Jse of rence rergy reso nergy excl ead as raw reter IE LCA ce and A1-A3 2,40E	00 00 00 00 00 00 00 00 00 00 00 00 00	SOUR A4 2,80E-0 0,00E+0 2,80E-0 4,70E-0 0,00E+0 0,00E+0	2 1,80 0 0,00 2 1,80 1 1,27 0 0,00 0 0,00 0 0,00 0 0,00 0 0,00 0 0,00 5 3,99 mergy ex w materi able prin T = Tots rry fuels; FLOV	SE: 1 n A5 SE-01 SE-01 SE-01 SE-01 SE-01 VE+00 SE-01 VE+00 SE-01 VE+00 SE-01 VE+00 SE-01 VS AN A5 .00E-09 Se-01	n ² Glas B1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ D WAS B1 0,00E	00 00 00 00 00 00 00 00 00 00 00 00 00	C1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ C1 C1 0,00E+	d Pair 00 4 00 0 00 4 00 0 00 7 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 4	1t C2 ,26E-03 ,00E+00 ,26E-03 ,37E-02 ,00E+00 ,37E-02 ,00E+00 ,00E+00 ,37E-02 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,20E-06 used as r energy res; pENRM urces; SM µels; FW = : C2 u,10E-09	C3 0,00 0,	DE +00	1,51E- 0,00E+ 1,51E- 1,18E- 0,00E+ 0,00E+ 0,00E+ 0,00E+ 3,00E- ERM = Use E Use of newable p dary mater h water	-00 -02 -01 -00 -00 -00 -00 -00 -00 -00 -00 -00	0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 renewable ry energy RSF = Use of D 0,00E+00
Param PER PER PENF PENF SM RSI NRS FW Captio	eter E M T T T T F F F F F F F F F	Unit [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1-A3 2,56E- 0,00E- 2,56E- 1,71E- 0,00E- 1,71E- 0,00E- 1,71E- 0,00E- 4,21E Jse of rence hergy resonergy excl hergy reso	-00 -00 -00 -01 -00 -00 -00 -00 -00 -00	SOUR A4 2,80E-00 0,00E+0 2,80E-00 4,70E-00 0,00E+00 4,70E-00 0,00E+00 4,70E-00 0,00E+00 4,70E-00 0,00E+00 4,70E-00 0,00E+10 4,70E-00 primary el seed as ranon-renew utputt A4 2,65E-00 3,90E-00	2 1.80 0 0,00 2 1.80 1 1.27 0 0,000 0 0,00 0 0,00 0 0,00 0 0,00 0 0,00 0 0,00 0 0,00 0 0,00 5 3,9 mergy ex w materi able prin T = Tots rry fuels; FLOV	A5 bE: 1 bE-01 bE+00	n ² Glas B1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ D WAS B1 0,00E	00 00 00 <	C1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ C1 C1 0,00E+ 0,00E+ C1 0,00E+ 0,00E+	d Pair 00 4 00 0 00 4 00 0 00 7 00 0 00 7 00 0 00 0 00 0 00 7 00 0 00 7 00 0 00 7 00 7 00 7 00 7 00 4 00 4	1t C2 1,26E-03 ,00E+00 ,26E-03 (37E-02 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,20E-06 used as r energy res ; PENRM urces; SM uels; FW = ; C2 1,0E-09 ,99E-06	C3 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 C3 C3 0,00	DE +00	1,51E 0,00E 1,51E 1,18E 0,00E 1,18E 0,00E 0,00E 0,00E 0,00E 0,00E ERM = Use ERM = Use ERM = Use ERM = Use of newable p dary mater h water C4 2,02E 5,50E	00 02 01 00 01 00 00 00 00 00 00 00 00 00 00	0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 enewable renewab
Param PER PER PENF PENF PENF SM RSI FW Captio RSI FW Captio RESU 1 m ² Param	eter E M M RE R R R R R R R R R R R R R	Unit [MJ] [M] [M] [M] [M] [M] [M] [M] [M	A1-A3 2,56E+ 0,00E+ 2,56E+ 1,71E+ 0,00E+ 0,00E+ 0,00E+ 4,21E Jse of rence ergy resonergy exclosed as raw rent 1E LCA Ce and A1-A3 2,40E 1,85E 5,07E	00 00 00 00 00 00 00 00 00 00 00 00 00	SOUR A4 2,80E-0 0,00E+0 2,80E-0 0,00E+0 4,70E-0 0,00E+0 4,70E-0 0,00E+0 4,70E-0 0,00E+0 4,70E-0 0,00E+0 4,70E-0 0,00E+0 4,70E-0 primary enzised as raimon-renewnials; PENR le secondd UTPUT t A4 2,65E-0 3,90E-0 6,40E-0	2 1,86 0 0,002 2 1,86 1 1,27 0 0,000 0 0,00000000	A5 3E-01 DE+00 3E-01 7E+00 3E-01 7E+00 DE+00 NRSF = NS AN Q00E-09 ,40E-02 ,75E-05	n² Glas B1 0,00E+ 0,00E 0,00E	00 00 00 00 00 00 00 00 00 00 00 00 00	C1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ C1 0,00E+ C1 0,00E+ 0,	d Pair 00 4 00 0 00 0 00 7 00 0 00 7 00 0 00 0 00 0 00 0 00 7 00 0 00 0 00 7 sources primary materials ondary fit ORIES 00 4 00 5 00 5 00 5 00 5	1t C2 ,26E-03 ,00E+00 ,26E-03 (37E-02 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,20E-06 used as r energy res ; FENRM urces; SM uels; FW = ; C2 ,10E-09 ,99E-06 0,94E-08	C3 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 C3 C3 0,00	DE +00	1,51E 0,00E 1,51E 1,18E 0,00E 1,18E 0,00E 0,00E 0,00E 0,00E 3,00E ERM = Us ERM = Us ERM = Us ERM = Us ERM = Us dary mate h water C4 2,02E 5,50E 1,59E	00 02 01 00 01 00 00 00 00 00 00 00 00 00 00	0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 enewable renewa
Param PER PER PENF PENF SM RSI NRS FW Captio	eter E M M R R R R R R R R F F F F F F F F F F	Unit [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1-A3 2,56E- 0,00E- 2,56E- 1,71E- 0,00E- 1,71E- 0,00E- 1,71E- 0,00E- 4,21E Jse of rence hergy resonergy excl hergy reso	-00 -00 -00 -00 -01 -00 -00 -00 -00 -00	SOUR A4 2,80E-00 0,00E+0 2,80E-00 4,70E-00 0,00E+00 4,70E-00 0,00E+00 4,70E-00 0,00E+00 4,70E-00 0,00E+00 4,70E-00 0,00E+10 4,70E-00 primary el seed as ranon-renew utputt A4 2,65E-00 3,90E-00	CEUS 2 1,86 0 0,00 2 1,86 1 1,27 0 0,00 1 1,27 0 0,00 1 1,27 0 0,00 0 0,00 0 0,00 0 0,00 0 0,00 0 0,00 0 0,00 0 0,00 8 4 5 5 7 3 0 0,0	A5 bE: 1 A5 bE-01 bE+00	n ² Glas B1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ D WAS B1 0,00E	S FIe 00 00 00 <	C1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ C1 C1 0,00E+ 0,00E+ C1 0,00E+ 0,00E+	d Pair 00 4 00 0 00 4 00 7 00 0 00 7 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 4 00 4 00 5 00 5 00 5 00 9 00 0	1t C2 1,26E-03 ,00E+00 ,26E-03 (37E-02 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,20E-06 used as r energy res ; PENRM urces; SM uels; FW = ; C2 1,0E-09 ,99E-06	C3 0,00 0,	DE +00	1,51E 0,00E 1,51E 1,18E 0,00E 1,18E 0,00E 0,00E 0,00E 0,00E 0,00E ERM = Use ERM = Use ERM = Use ERM = Use of newable p dary mater h water C4 2,02E 5,50E	-00 -02 -01 -00 -01 -00 -00 -00 -00 -00 -00 -00	0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 enewable renewab
Param PER PER PEN PEN PEN SM RSI NRS FW Captio RESU Param HWI NHW RWI CRU MEF	eter	Unit [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1-A3 2,56E- 0,00E- 2,56E- 1,71E- 0,00E- 1,71E- 0,00E- 1,71E- 0,00E- 0,00E- 1,71E- 0,00E- 1,71E- 0,00E- 1,71E- 1,7	00 00 00 00 00 00 00 00 00 00 00 00 00	SOUR A4 2,80E-0 0,00E+0 2,80E-0 4,70E-0 0,00E+0	CEUS 2 1,86 0 0,00 2 1,86 1 1,27 0 0,00 1 1,27 0 0,00 1 1,27 0 0,00 5 3,99 nergy exx material able print T T Tota ryr fuels 5 8 4 5 5 7 3 0 0,0 0 9 0 0,0	SE: 1 n A5 58-01 58-01 58-01 58-01 58-01 58-01 72+00 58-01 72+00 72+00 72+00 58-01 72+00 58-01 72+00 58-01 72+00 58-02 758-05 008+00 008+00 008+00 008+00	n ² Glas B1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ T = Total gy resou 00n-renev Use of nn D WAS B1 0,00E B1 0,00E 0,00E 0,00E	00 00 \$TEC 00 \$+00 \$+00 \$+00 \$+00	C1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ C1 0,00E+	d Pair 00 4 00 0 00 4 00 7 00 0 00 7 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 4 00 4 00 4 00 4 00 4 00 4 00 4 00 4 00 4 00 4 00 5 00 0 00 0	It C2 1,26E-03 ,00E+00 ,26E-03 ,37E-02 ,00E+00 ,94E-08 ,00E+00 ,00E+00 ,00E+00 ,00E+00	C3 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 aw mate sources; = Use of C3 0,000 0,00	DE +00	1,51E- 0,00E+ 1,51E- 1,18E- 0,00E+ 1,18E- 0,00E+ 0,00E+ 3,00E- ERM = Use i = Use of newable p dary mater h water C4 2,02E- 5,50E- 1,59E- 0,00E+ 0,00E+ 0,00E+	00 02 01 00 01 00 00 00 00 00 00 00	0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00
Param PER PER PEN PEN PEN SM RSI NRS FW Captio RESU Tm2 Param HW RW CCRU MEF EEE	eter	Unit [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1-A3 2,56E- 0,00E- 2,56E- 1,71E- 0,00E- 1,71E- 0,00E- 1,71E- 0,00E- 1,71E- 0,00E- 1,71E- 1,71E- 0,00E- 1,71E- 1,7	00 00 00 00 00 00 00 00 00 00	A4 2,80E-0 0,00E+0 2,80E-0 4,70E-0 0,00E+0	CEUS 2 1,80 0 0,00 2 1,80 1 1,27 0 0,00 1 1,27 0 0,000 1 1,27 0 0,000 5 3,99 nergy exw material ryr fuels FLON 8 4 5 5 7 3 0 0,0 0 9 0,0 9 0 0,0	A5 5E: 1 5E: 01 7E +00 5E+00 7E+00 5E+00 1E-04 0E+00 1E-04 NRSF = VS AN A5 .00E+02 .75E-05 .00E+00 .40E-02 .75E-05 .00E+00 .10E-02	n ² Glas B1 0,00E+ 0,0	S Fle 00 00 =+00 =+00 =+00 =+00 =+00 =+00	C1 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ C1 0,00E+	d Pair 00 4 00 0 00 4 00 7 00 0 00 7 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 4 00 5 00 0 00 0 00 0 00 0 00 0	It C2 ,26E-03 ,00E+00 ,26E-03 ,37E-02 ,00E+00 ,37E-02 ,00E+00 ,00E+00 ,37E-02 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,99E-06 ,94E-08 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00	C3 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 aw mate sources; = Use of C3 0,000 0,000	DE+00	1,51E- 0,00E+ 1,51E- 1,18E- 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+ 0,00E+	00 02 01 00 01 00 00 00 00 00 00 00	0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00
Param PER PER PEN PEN PEN SM RSI NRS FW Captio RESU Param HWI NHW RWI CRU MEF	eter	Unit [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ] [MJ]	A1-A3 2,56E- 0,00E- 2,56E- 1,71E- 0,00E- 1,85E 5,07E 0,00E- 0,00E	00 00 00 00 00 00 00 00 00 00 00 00 00	A4 2,80E-00 0,00E+00 2,80E-00 4,70E-00 0,00E+00	CEUS 2 1,80 0 0,00 2 1,80 1 1,27 0 0,000 1 1,27 0 0,000 0 0,000 0 0,000 5 3,99 margy exw materinable print T = Tots try fuels FLOV 8 8 4 5 5 7 3 0 0,0 0 9 0,0 4 0 1	A5 5E: 1 5E: 01 7E+00 5E+01 7E+00 5E+00 1E-04 0E+00 1E-04 NRSF = VS AN A5 .00E-09 .40E-02 .75E-05 00E+00 .40E-02 .75E-05 00E+00 .10E-02 .26E-01	n ² Glas B1 0,00E+ 0,0	S Fle 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 STEC 0 +00 +00 +00 +00 +00 +00	C1 0,00E+ 0,	d Pair 00 4 00 0 00 4 00 7 00 0 00 7 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 0 00 4 00 5 00 0 00 0 00 0 00 0 00 0 00 0 00 0	It C2 ,26E-03 ,00E+00 ,26E-03 ,37E-02 ,00E+00 ,37E-02 ,00E+00 ,00E+00 ,37E-02 ,00E+00 ,00E+00 ,37E-02 ,00E+00 ,00E+00 ,20E-06 used as r energy res; pENRM µrces; SM µels; FW = ; C2 4,10E-09 ,99E-06 ,94E-08 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00 ,00E+00	C3 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 0,00 aw mate sources; = Use of C3 0,000 0,00	DE +00	1,51E 0,00E 1,51E 1,18E 0,00E 1,18E 0,00E 0,00E 0,00E 0,00E 0,00E 0,00E 0,00E 0,00E 0,00E 0,00E 0,00E 0,00E 0,00E 0,00E 0,00E 0,00E 0,00E 0,00E	00 02 01 00 00 00 00 00 00 00 00 00	0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00 0,00E+00

PRODUCT STAGE ON PR ST Image: State of the sta	A5 B1 X X A - ENVIRC A3 A4 30E-01 7,00 00E+00 1,20 20E-03 6,00 20E-04 2,30 33E-07 5,10 00E+00 1,000 ing potential; OE 00	Maintenance B58 B3 Repair	MPACT: 1 B1 02 0,00E+0 11 0,00E+0 04 0,00E+0	B6 IR MND I m² Alumir c1 0 0,00E+0 00 0,00E+0 0		X X	× 8 Waste processing	GE E E C4 X X	ENEFITS AND LOADS SEYOND THE SYSTEM BOUNDARIES 			
A1 A2 A3 A4 X X X X RESULTS OF THE LC Parameter Unit A1 GWP [kg CO2-Eq.] 4.3 ODP [kg CO2-Eq.] 4.3 POCP [kg ethene-Eq.] 1.4 ADPE [kg Sb-Eq.] 9.0 ADPF [MJ] 6.5 Caption GWP = Global warm Caption GWP = Global warm Caption GWP = Global warm RESULTS OF THE LC Parameter Parameter Unit A1-A PERE [MJ] 2,171 PENRE [MJ] 0,000 PERT [MJ] 0,001 PENRE <td< td=""><td>A5 B1 X X A - ENVIRC A3 A4 30E-01 7,00 00E+00 1,20 20E-03 6,00 20E-04 2,30 33E-07 5,10 00E+00 1,000 ing potential; OE 00</td><td>B2 B3 MND MNF NMENTAL I A5 E-03 4,00E- E-06 1,54E- E-06 1,54E- E-06 1,00E- E-08 1,03E- E-08 1,03E- E-10 6,71E- E-10 6,71E-</td><td>B4 B MNR MN MPACT: 1 02 02 0,00E+(11) 04 0,00E+(12)</td><td>B6 IR MND IR Alumin C1 00 00 0,00E+0 00 0,00E+0</td><td>B7 C MND >> nium Lar c2 00 1,02</td><td>1 C2</td><td>C3 X</td><td>- C4 X</td><td>D</td></td<>	A5 B1 X X A - ENVIRC A3 A4 30E-01 7,00 00E+00 1,20 20E-03 6,00 20E-04 2,30 33E-07 5,10 00E+00 1,000 ing potential; OE 00	B2 B3 MND MNF NMENTAL I A5 E-03 4,00E- E-06 1,54E- E-06 1,54E- E-06 1,00E- E-08 1,03E- E-08 1,03E- E-10 6,71E- E-10 6,71E-	B4 B MNR MN MPACT: 1 02 02 0,00E+(11) 04 0,00E+(12)	B6 IR MND IR Alumin C1 00 00 0,00E+0 00 0,00E+0	B7 C MND >> nium Lar c2 00 1,02	1 C2	C3 X	- C4 X	D			
X X X X RESULTS OF THE LC Parameter Unit A1 GWP [kg CO2rEq.] 4,3 ODP [kg CO2rEq.] 4,3 ODP [kg CO2rEq.] 4,3 ODP [kg CO11-Eq.] 0,0 AP [kg QP04] ³ -Eq.] 1,2 POCP [kg Sb-Eq.] 9,1 ADPE [MJ] 6,5 Caption GWP = Global warm Caption GWP = Global warm Caption GWP = Global warm PERE [MJ] 2,171 PERE [MJ] 2,177 PERM [MJ] 0,000 PERT [MJ] 2,171 PENRE [MJ] 2,171 PERM [MJ] 0,000 PERT [MJ] 2,171 PENRE [MJ] 7,301 SM [kg] 0,001 PENRT [MJ] 0,001 RSF [MJ] 0,001	X X A - ENVIRO A3 A4 30E-01 7,00 00E+00 1,22 20E-03 6,00 20E-04 1,33 32E-07 5,10 00E+00 1,000 00E+00 1,000	MND MNF NMENTAL I	MNR MN MPACT: 1 02 0,00E+(11 0,00E+(04 0,00E+(IR MND I m ² Alumir C1 0 0,00E+0 0 0,00E+0	MND >	x x	X	X				
RESULTS OF THE LC Param eter Unit A1 GWP [kg CO2-Eq.] 4,3 ODP [kg CC2-Eq.] 4,3 ODP [kg CC2-Eq.] 0,0 AP [kg SO2-Eq.] 2,2 EP [kg PO4) ³ -Eq.] 1,2 POCP [kg ethene-Eq.] 1,4 ADPE [kg Sb-Eq.] 9,1 ADPF [MJ] 6,5 Caption GWP = Global warm Eutrophication poter RESULTS OF THE LC Parameter Unit PERE [MJ] 2,171 PERM [MJ] 0,000 PERT [MJ] 7,301 PENRM [MJ] 7,301 PENRM [MJ] 7,301 SM [kg] 0,001	A - ENVIRO A3 A4 30E-01 7,00 0E+00 1,20 20E-03 6,00 20E-04 1,30 22E-04 2,33 33E-07 5,10 0E+00 1,00 ing potential; OD 0	NMENTAL I A5 E-03 4,00E- E-06 1,54E- E-06 1,00E- E-08 1,03E- E-10 6,71E-	MPACT: 1 B1 02 0,00E+0 11 0,00E+0 04 0,00E+0	m ² Alumir C1 0 0,00E+0 0 0,00E+0	nium Lar C2	ninate			Х			
Param eter Unit A1 GWP [kg CO ₂ -Eq.] 4,3 ODP [kg CC11-Eq.] 0,0 AP [kg QC2-Eq.] 2,3 EP [kg (PO4) ³ -Eq.] 1,4 POCP [kg Sb-Eq.] 9,1 ADPE [kg Sb-Eq.] 9,1 ADPF [MJ] 6,5 Caption GWP = Global warm Eutrophication poter RESULTS OF THE LC Parameter Unit A1-Ai PERE [MJ] 2,171 PERM [MJ] 0,001 PERT [MJ] 2,171 PENRE [MJ] 2,171 PERM [MJ] 0,001 PERT [MJ] 7,301 SM [kg] 0,001 RSF [MJ] 0,001	A3 A4 30E-01 7,00 00E+00 1,20 20E-03 6,00 20E-04 1,30 42E-04 2,30 33E-07 5,10 00E+00 1,00 ing potential; OE 0	A5 E-03 4,00E- E-18 1,20E- E-06 1,54E- E-06 1,00E- E-08 1,03E- E-10 6,71E-	B1 02 0,00E+0 11 0,00E+0 04 0,00E+0	C1 0 0,00E+0 0 0,00E+0	C2		3					
eter Unit A1 GWP [kg CO ₂ -Eq.] 4,3 ODP [kg CC2-Eq.] 4,3 ODP [kg CC2-Eq.] 2,3 EP [kg (PO4) ³ -Eq.] 1,4 POCP [kg Sb-Eq.] 9,1 POCP [kg Sb-Eq.] 9,1 ADPE [MJ] 6,5 Caption GWP = Global warm Eutrophication poter RESULTS OF THE LC Parameter Unit A1-Ai PERE [MJ] 2,171 PERM [MJ] 0,001 PERT [MJ] 2,171 PERM [MJ] 0,001 PERT [MJ] 7,301 SM [kg] 0,001 RSF [MJ] 0,001	30E-01 7,00 0E+00 1,20 20E-03 6,00 20E-04 1,30 12E-04 2,30 53E-07 5,10 0E+00 1,00 ing potential; OD	E-03 4,00E- E-18 1,20E- E-06 1,54E- E-06 1,00E- E-08 1,03E- E-10 6,71E-	02 0,00E+(11 0,00E+(04 0,00E+(C1 0 0,00E+0 0 0,00E+0	C2		3					
ODP [kg CFC11-Eq.] 0,0 AP [kg CO2-Eq.] 2,7 EP [kg (PO4) ³ -Eq.] 1,7 POCP [kg sb-Eq.] 1,7 POCP [kg sb-Eq.] 9,1 ADPE [kg Sb-Eq.] 9,1 ADPF [ky] Sb-Eq.] 9,1 Caption Eutrophication poter Eutrophication poter RESULTS OF THELC Parameter Unit A1-A PERE [MJ] 2,171 PERM [MJ] 0,000 PERT [MJ] 2,171 PENRE [MJ] 2,171 PENRE [MJ] 2,171 PENRE [MJ] 0,000 PENRE [MJ] 0,001 PENRT [MJ] 0,001 PENRM [MJ] 0,001	0E+00 1,20 20E-03 6,00 20E-04 1,30 42E-04 2,30 53E-07 5,10 00E+00 1,00 ing potential; OE	E-18 1,20E- E-06 1,54E- E-06 1,00E- E-08 1,03E- E-10 6,71E-	11 0,00E+0 04 0,00E+0	0,00E+0				C4	D			
ADPF [MJ] 6,5 Caption GWP = Global warm Eutrophication poter RESULTS OF THE LC Parameter Unit A1-A PERE [MJ] 2,171 PERM [MJ] 0,001 PERT [MJ] 2,171 PERM [MJ] 0,001 PERT [MJ] 7,301 PENRM [MJ] 0,001 PENRT [MJ] 0,001 RSF [MJ] 0,001	OE+00 1,00		05 1,64E-1	0 0,00E+0 0 0,00E+0	00 8,90 00 2,01 00 -5,00	E-19 0,00 E-07 0,00 E-07 0,00 E-09 0,00	DE+00 DE+00 DE+00 DE+00 DE+00	2,50E-0 1,40E-1 1,50E-0 1,70E-0 1,14E-0	7 0,00E+00 5 0,00E+00 6 0,00E+00 6 0,00E+00			
GWP = Global warm Eutrophication poter RESULTS OF THE LC Parameter Unit A1-A PERE [MJ] 2,171 PERM [MJ] 0,001 PERT [MJ] 2,171 PERRE [MJ] 2,171 PERR [MJ] 0,001 PENRE [MJ] 7,301 PENRT [MJ] 0,001 SM [kg] 0,001 RSF [MJ] 0,001	ing potential; OE	,				,	DE+00 DE+00	9,20E-1 3,50E-0	,			
PERE [MJ] 2,171 PERM [MJ] 0,001 PERT [MJ] 2,171 PENRE [MJ] 7,301 PENRE [MJ] 7,301 PENRT [MJ] 7,301 PENRT [MJ] 0,000 SM [kg] 0,001 RSF [MJ] 0,001	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Caption Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non- Cost Formation potential; OCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non- RESULTS OF THE LCA - RESOURCE USE: 1 m ² Aluminium Laminate											
PERM [MJ] 0,001 PERT [MJ] 2,171 PENRE [MJ] 7,301 PENRM [MJ] 0,001 PENRT [MJ] 7,301 SM [kg] 0,001 RSF [MJ] 0,001	3 A4	A5	B1	C1	C2	C3	;	C4	D			
PERT [MJ] 2,171 PENRE [MJ] 7,301 PENRM [MJ] 0,001 PENRT [MJ] 7,301 SM [kg] 0,001 RSF [MJ] 0,001	E+00 6,00E	-03 1,54E-01	0,00E+00	0,00E+00	8,10E)E+00	4,60E-0				
PENRE [MJ] 7,301 PENRM [MJ] 0,001 PENRT [MJ] 7,301 SM [kg] 0,001 RSF [MJ] 0,001			0,00E+00	0,00E+00	0,00E		E+00	0,00E+0				
PENRM [MJ] 0,001 PENRT [MJ] 7,301 SM [kg] 0,001 RSF [MJ] 0,001			0,00E+00 0,00E+00	0,00E+00 0,00E+00	8,10E)E+00)E+00	4,60E-0				
SM [kg] 0,001 RSF [MJ] 0,001	,	,	0,00E+00	0,00E+00	0,00E	,)E+00	0,00E+0	,			
RSF [MJ] 0,001			0,00E+00	0,00E+00	1,40E		E+00	3,60E-0				
			0,00E+00 0,00E+00	0,00E+00 0,00E+00	0,00E 0,00E)E+00)E+00	0,00E+0 0,00E+0				
NRSF [MJ] 0,001	E+00 0,00E		0,00E+00	0,00E+00	0,00E)E+00	0,00E+0				
	E-03 1,00E		0,00E+00	0,00E+00	1,38E)E+00	9,10E-0				
Caption Caption renewable primary renewable primary of secondary mater	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 pon-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRE = Use of non-											
1 m ² Aluminium Lami					1							
Parameter Unit A1-A		A5	B1	C1	C2	C3		C4	D			
	E-09 5,50E			,		,	E+00	6,10E-1				
	E-01 8,00E E-04 1,30E				-)E+00)E+00	1,60E-0 4,80E-0				
CRU [kg] 0,001	,				,	,	E+00	0,00E+0	,			
MFR [kg] 0,001		+00 2,00E-0	3 0,00E+00			+00 0,00)E+00	0,00E+0				
MER [kg] 0,001	E+00 0,00E	+00 0,00E+0	0,00E+00	0,00E+00	0 0,00E	+00 0,00)E+00	0,00E+0	0 0,00E+00			
EEE [MJ] 0,001							E+00	0,00E+0				
EET [MJ] 0,00l HWD = Hazardous for re-use; MFR =		NHWD = Non-I	azardous was Materials for e	te disposed; F	RWD = Rad	ioactive was			= Components			