ENVIRONMENTAL PRODUCT DECLARATION (EPD) FOR

ALUMINIUM EXTRUDED PROFILES 6060

PRODUCED BY PANDOLFO ALLUMINIO SPA – BORGOVALBELLUNA AND FELTRE*

Pandolfo Alluminio

Company: Pandolfo Allumino Spa – Via della Provvidenza 143, 35030, Sarmeola (PD), Italy
Programme operator: The International EPD ® System – c/o EPD International AB - Valhallavägen 81 SE-114 27 Stockholm Sweden - www.environdec.com
PCR: 2019:14 Construction products, version 1.11
Geographical scope: Global
EPD registration number: S-P-07765
Date of publication (issue): 2022-12-15
Date of validity: 2027-12-06

EPD in accordance with ISO 14025 and EN 15804:2012+A2:2019
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

*Aluminium profiles covered by the present EPD are implemented with billet 6060 produced by Fonderie Pandolfo

SUMMARY

1 PROGRAMME RELATED INFORMATION

This EPD is developed under the program The International EPD ® System, in compliance with the General Program Instruction version 3.01 for the EPD development and the Product Category Rules PCR "Construction products" 2019:14 version 1.11.

EPD owner has the sole ownership, liability and responsibility of the EPD.

More information about the International EPD ® System is available on the website: https://www.environdec.com/

2 PRODUCT RELATED INFORMATION

2.1 THE COMPANY

Pandolfo Alluminio Spa has been present in the aluminium extrusion business for fifty years. The company has two plants.

The extrusion plant is located in Borgo Valbelluna. This is a cutting-edge plant with four presses capable of turning out over 30,000 tonnes of aluminium profiles a year. The facility has 7 modern automated furnaces for heat treating metal profiles. An advanced automated handling system taking profiles from the press to the packaging department results in shorter transfer times and helps stop surfaces being damaged in the process. The manufacturing process is integrated with the SAP management system, ensuring complete traceability of each stage.

Added value works are performed in Feltre's plant. This is 22,000 m2 plant addressing surface treatments, machining and the thermal break. Anodized aluminium is produced with an ultra-modern automated system and all stages of the operation are managed by dedicated software, which ensures the quality and repeatability of the Qualanod-certified process are up to standard. The painted aluminium is produced with an automated vertical powder coating system and the process is Qualicoat certified. The machining department is fitted out with 60 or so machines of both the CNC (machining centres) and traditional variety.

The company is certified according to ISO 14001, since 2017

2.2 THE PRODUCTS

The studied aluminium profiles are products used in several markets, among all automotive, building and construction, industrial and general engineering. Profiles are manufactured starting from aluminium billets (externally purchased) which are then extruded in presses. The produced profiles eventually undergo further processing, namely machining (this includes different types of mechanical working processes among all cutting, drilling, milling, shearing/drawing, threading, bending), surface treatments (anodising and painting) and thermal break.

Aluminium profiles covered by the present EPD are all implemented with the aluminium alloy 6060 produced by Fonderie Pandolfo[1]. Sub-families covered by the present EPD are:

- mill finished profile
- anodised profile
- painted profile
- machined profile
- thermal break
- thermal break, anodised
- thermal break, painted

The production process of all products covered by the present EPD is schematized in Figure 1.

The reference CPC code is 415 “Semi-finished products of copper, nickel, aluminium, lead, zinc and tin or their alloys”.

[1] The billet 6060 by Fonderie Pandolfo is covered by EPD (S-P-07223). The billet used for the production of profiles is tracked by Pandolfo Alluminio and can be certified upon request.

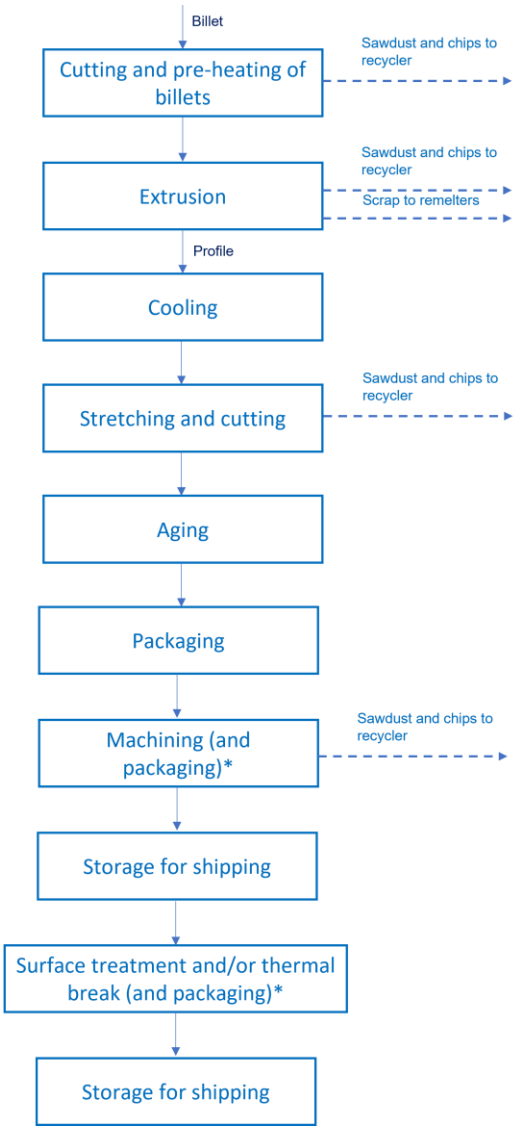


Figure 1: Production process of the aluminium profile 6060, produced in Borgo Valbelluna and Feltre by Pandolfo Alluminio. * Added value works can be performed in several order (e.g. anodising and then machining, or viceversa).

2.2.1 TECHNICAL CHARACTERISTICS OF THE PRODUCT

Extruded Profiles: Aluminium alloy extruded profiles produced according Customers specifications and listed standard (or equivalent):

- EN 573-3 “Aluminum and aluminum alloys - Chemical composition and shape of semi-finished products - Part 3: Chemical composition and shape of products”
- EN755-2 “Aluminum and aluminum alloys. Bars, tubes and extruded profiles. Mechanical characteristics.”
- EN755-9 “Aluminum and aluminum alloys. Bars, tubes and extruded profiles. Part 9: Profiles, dimensional and shape tolerances.”

Anodized Profiles: Aluminium alloy extruded profiles anodized according Customer specification and Qualanod Standard. Pandolfo licence reference number 715

Powder coated profiles: Aluminium alloy extruded profiles powder coated (painted) according Customer specification and Qualicoat Standard. Pandolfo licence reference number 720

Thermal Break assembled profiles: Thermal Break profiles assembled according Customer specification and EN 14024 standard "Metal profiles with thermal break. Mechanical performance. Requirements, checks and tests for evaluation."

2.2.2 PRODUCT COMPOSITION

Profiles are made of aluminium billets (input metal), sourced from Fonderie Pandolfo, and of polyamide in the case of thermal break. A coating layer (powder coating) is applied for painted profiles.

The composition of the products covered by the present EPD is reported in Table 1. The content of SVHC does not exceed 0,1 % of the total weight.

Table 1: Composition of the aluminium profiles

Composition (% in weight) of product*							
	Mill finished	**Anodised**	**Painted**	**Machined**	**Thermal break**	**Thermal break anodised**	**Thermal break painted**
Aluminium, of which	***100***	***100***	***100***	***100***	***96,75***	***96,75***	***96,75***
Process scrap				60,73			
Post consumer scrap				19,18			
Polyamide	-	-	-	-	***3,25***	***3,25***	***3,25***
Additional weight (kg) to the powder coating, per declared unit							
Powder coating	-	-	***0,0322***	-	-	-	***0,0322***
Packaging weight (kg), per declared unit							
	Extrusion	**Anodising**	**Painting**	**Machining**	**Thermal break**	**Thermal break anodised**	**Thermal break painted**
Wood	0,0378	0,042375	0,042375	0,042375	0,042375	0,042375	0,042375
Cardboard	0,018	0,008396	0,008396	0,008396	0,008396	0,008396	0,008396
Paper	0,000369	-	-	-	-	-	-
Nylon	0,00761	0,002828	0,002828	0,002828	0,002828	0,002828	0,002828
Metal	0,000388	0,000283	0,000283	0,000283	0,000283	0,000283	0,000283
Plastic (PE/ PET)	0,000182	0,002046	0,002046	0,002046	0,002046	0,002046	0,002046

** higher detail on the composition of 6060 by Fonderie Pandolfo is available in the related EPD (S-P-07223 on EPD System)*

3 ENVIRONMENTAL PRODUCT DECLARATION

3.1 METHODOLOGY

The study behind the present EPD has been performed according to the state of art of the LCA methodology, with specific reference to the construction sector, in accordance with the following standard and guidelines:

- EN ISO 14040:2006/Amd 1:2020 - Environmental management -- Life cycle assessment -- Principles and framework

- EN ISO 14044:2006/Amd 2:2020 - Environmental management -- Life cycle assessment -- Requirements and guidelines
- EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.
- General Programme Instructions (GPI) for the International EPD® VERSION 3.01
- The International EPD® System Product Category Rules (PCRs) for construction products, 2019:14 version 1.11.

The EPD is mainly addressed to the business-to-business communication. The data elaboration has been performed with the Gabi software, version 10.6.1.35. The database used are the most updated ones implemented in Gabi software. More in detail, main database used is Sphera, European Aluminium and IAI. The LCIA method used is the method EN 15804:2012+A2:2019.

3.2 DECLARED UNIT

The declared unit is 1 kg of aluminium profile, plus its packaging.

3.3 SYSTEM BOUNDARY

The EPD is a "Cradle to Gate with modules C1-C4 and D and optional modules". Modules A4-A5 and B1 to B7 are excluded as they are strongly dependent on the specific application within the reference market.

The included modules are listed here below (and represented in Table 2 and Figure 2):

Product stage

- **Module A1 -** raw material extraction and processing, processing of secondary material input (e.g. recycling processes) and generation of electricity, steam and heat from primary energy sources, also including their extraction, refining and transport thereof;
- **Module A2 -** transportation up to the factory gate and internal transport
- **Module A3 –** production of ancillary (auxiliaries) or pre-products; manufacturing of products and co-products; waste disposal; manufacturing of packaging for the finished products**.**

The system boundary to nature concerns the wood, which is used in the model for the packaging. The process used for the wood representation includes the forestry.

End of life stage

- **Module C1 –** De-construction, demolition processes.
- **Module C2 –** Transport from collection point to waste processing and disposal site
- **Module C3 –** Shredding and sorting of fractions for recycling
- **Module C4 –** Landfill of material fractions not entering the recycling treatment

Benefit and load beyond the product system (Module D): transport to recycling treatment site, remelting process and benefit due to the avoided production of primary aluminium.

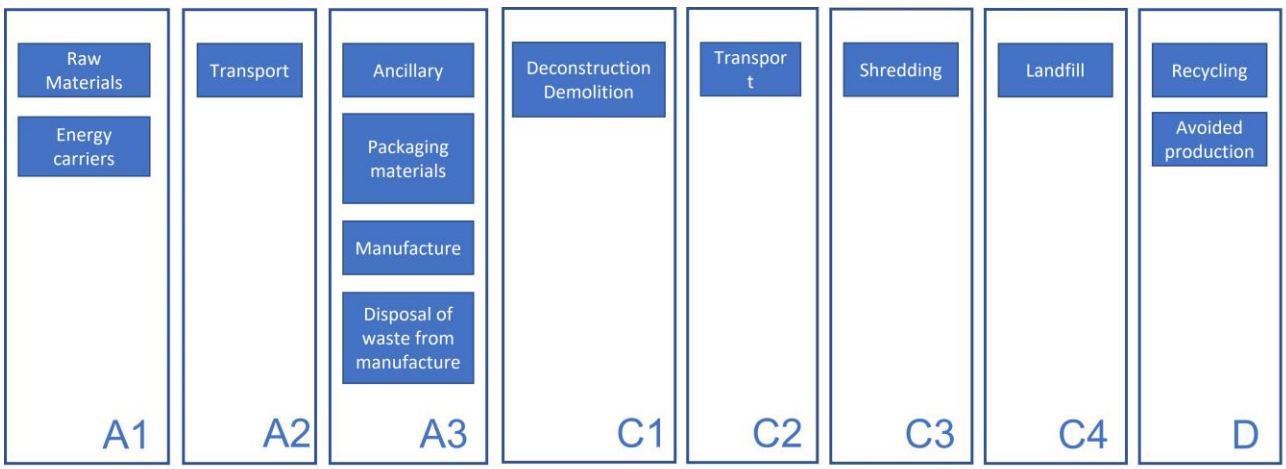
The reference period of the study is 2021.

Table 2: Life cycle stages included in the study for the aluminium profiles by Pandolfo Alluminio Spa

	PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE	END-OF-LIFE STAGE				BENEFITS and LOADS BEYOND SYSTEM BOUNDARY
	A1	A2	A3	A4	A5	B1 to B7	C1	C2	C3	C4	D
	Raw Material Supply	Transport	Manufacturing	Transport	Construction/Installation	Use, Maintenance, Repair, Replacement, Refurbishment, Operational energy use, Operational water use	Dismantling/De-construction/Demolition	Transport	Waste processing	Disposal	Reuse, Recycling potential
	X	X	X	NA	NA	NA	X	X	X	X	X
Geography	EU, extra-EU, GLO	EU, extra-EU, GLO	EU, IT	-	-	-	EU	GLO, EU	EU	EU	EU, GLO
Specific data*	>90%			-	-	-	-	-	-	-	-
Other data (conservative or proxy)	<10%			-	-	-	-	-	-	-	-
Variation – products**	-37,5%			-	-	-	-	-	-	-	-
Variation – site	Not relevant			-	-	-	-	-	-	-	-

*Share of GWP-GHG indicator in A1-A3 coming from product-specific LCI data. For the aim of the present table, definitions of specific data and proxy data differ from definitions in the GPI.
** Calculated with reference to the worst case, i.e. thermal break painted. Maximum variation is registered for mill finished.

Figure 2: System boundaries for the study of the aluminium profiles produced by Pandolfo Alluminio



3.4 MAIN ASSUMPTIONS, CUT-OFFS, BACKGROUND DATA INFORMATION AND SCENARIOS

3.4.1 DATA QUALITY

Specific data are used for all of Pandolfo Alluminio's processes based on the reference production period. All background data used in the study are from LCI database and are not older than 5 years.

3.4.2 ALLOCATION

The allocation is made in accordance with the provisions of EN 15804. Energy and resources (water and ancillary) in input and waste and emissions in output are allocated to the profile production based on the mass.

3.4.3 CUT-OFFS CRITERIA

Raw and packaging materials are fully included as well as the energy for manufacturing. In the same way, all auxiliaries, manufacturing waste (including hazardous waste) and air emissions are accounted for.

The construction of the manufacturing site (capital goods) is not included. Minor input and output are also excluded being negligible in terms of mass (namely, adhesive PVC used in packaging of finished products, minor input auxiliaries, plastic packaging of few auxiliaries, minor waste auxiliaries, PM emissions from machining, painting, anodising and thermal break).

3.4.4 SCENARIOS FOR OPTIONAL MODULES

The end-of-life scenario is Europe-based and relates to the application in building&construction. No impacts of dismantling or demolition processes are allocated to the profiles.

After collection, aluminium is shredded, sorted, and sent to remelting. Material lost at the collection and waste treatment sites is sent to landfill. Collection and waste processing efficiency are reported in Table 3, whereas

Table 4 reports transport information.

Table 3: Applied collection and waste processing efficiency for the End-of-life.

End-of-life - collection and processing efficiency	
Collection efficiency - %	
Aluminium collected	**96**
Aluminium lost at the collection site	**4**
Processing efficiency (shredding) - %	
Aluminium sent to recycling after shredding	**95**
Aluminium lost in the shredding	**5**

Table 4: Distance and transport means applied for the End-of-life.

End-of-life – transport information for modules C and D		
Transport mean	**Utilisation ratio - %**	**Distance travelled - km**
Materials not collected and sent to landfill (module C2)		
Diesel truck, Euro IV, > 32 t	61	200
Material collected and sent to waste processing (module C2)		
Diesel truck, Euro IV, > 32 t	61	200*
Materials from waste processing to remelter (module D)		
Diesel truck, Euro IV, > 32 t	61	200

*no additional transport is assumed for material which is landfilled after waste processing.

Module D address burden and benefit from net output flows leaving the product system, i.e. from flows leaving the product system, lowered of the recycled content (%) initially included in the product.

For painted and thermal break profiles, the net flow entering the remelting is reduced by the % of powder and/or polyamide in the profile.

The primary aluminium ingot consumed in Europe is considered for the accounting of benefits from remelted aluminium.

3.5 PARAMETERS DESCRIBING THE ENVIRONMENTAL IMPACT

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

Table 5 Characterised results for 6060, mill finished, 1 kg

6060 - mill finished						
Core impacts indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate Change – total - GWPtot [kg CO2 eq.]	3,17E+00	0,00E+00	1,30E-02	1,90E-02	1,28E-03	-1,51E+00
Climate Change, fossil - GWPf [kg CO2 eq.]	3,08E+00	0,00E+00	1,29E-02	1,89E-02	1,31E-03	-1,50E+00
Climate Change, biogenic - GWPb [kg CO2 eq.]	8,93E-02	0,00E+00	-1,79E-05	1,70E-04	-3,89E-05	-3,12E-03
Climate Change, land use and land use change - GWPluc [kg CO2 eq.]	8,92E-04	0,00E+00	7,24E-05	4,01E-06	2,42E-06	-2,71E-04
Ozone depletion - ODP [kg CFC-11 eq.]	3,75E-12	0,00E+00	7,78E-16	2,77E-13	3,09E-15	-1,13E-11
Acidification – AP [Mole of H+ eq.]	1,70E-02	0,00E+00	7,65E-05	4,13E-05	9,31E-06	-8,74E-03
Eutrophication, freshwater – Epfr [kg P eq.]*	2,98E-06	0,00E+00	3,88E-08	5,53E-08	2,23E-09	-6,71E-07
Eutrophication, marine - EPmar [kg N eq.]	3,24E-03	0,00E+00	3,75E-05	9,29E-06	2,38E-06	-1,26E-03
Eutrophication, terrestrial – Epter [Mole of N eq.]	3,54E-02	0,00E+00	4,15E-04	9,74E-05	2,62E-05	-1,38E-02
Photochemical ozone formation, human health – POCP [kg NMVOC eq.]	9,47E-03	0,00E+00	7,22E-05	2,51E-05	7,23E-06	-3,80E-03
Resource use, mineral and metals – ADPe [kg Sb eq.]**	7,31E-07	0,00E+00	1,09E-09	5,16E-09	1,35E-10	-3,37E-07
Resource use, fossils – ADPf [MJ]**	3,40E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,84E+01
Water use - WU [m^3 world equiv.]**	7,49E-01	0,00E+00	1,17E-04	4,24E-03	1,44E-04	-2,23E-01
Eutrophication, freshwater [kg PO34 eq.]	9,15E-06	0,00E+00	1,19E-07	1,70E-07	6,84E-09	-2,06E-06
Additional indicator required by PCRs	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate change - GWP-GHG [kg CO2 eq.]	3,08E+00	-	-	-	-	-

* The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.
** The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Table 6 Characterised results for 6060, anodised, 1 kg

6060 - anodised						
Core impacts indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate Change – total - GWPtot [kg CO2 eq.]	4,57E+00	0,00E+00	1,30E-02	1,90E-02	1,28E-03	-1,51E+00
Climate Change, fossil - GWPf [kg CO2 eq.]	4,47E+00	0,00E+00	1,29E-02	1,89E-02	1,31E-03	-1,50E+00
Climate Change, biogenic - GWPb [kg CO2 eq.]	9,89E-02	0,00E+00	-1,79E-05	1,70E-04	-3,89E-05	-3,12E-03
Climate Change, land use and land use change - GWPluc [kg CO2 eq.]	1,14E-03	0,00E+00	7,24E-05	4,01E-06	2,42E-06	-2,71E-04
Ozone depletion - ODP [kg CFC-11 eq.]	1,08E-11	0,00E+00	7,78E-16	2,77E-13	3,09E-15	-1,13E-11
Acidification – AP [Mole of H+ eq.]	2,02E-02	0,00E+00	7,65E-05	4,13E-05	9,31E-06	-8,74E-03
Eutrophication, freshwater – Epfr [kg P eq.]*	4,23E-06	0,00E+00	3,88E-08	5,53E-08	2,23E-09	-6,71E-07
Eutrophication, marine - EPmar [kg N eq.]	4,43E-03	0,00E+00	3,75E-05	9,29E-06	2,38E-06	-1,26E-03
Eutrophication, terrestrial – Epter [Mole of N eq.]	4,84E-02	0,00E+00	4,15E-04	9,74E-05	2,62E-05	-1,38E-02
Photochemical ozone formation, human health – POCP [kg NMVOC eq.]	1,28E-02	0,00E+00	7,22E-05	2,51E-05	7,23E-06	-3,80E-03
Resource use, mineral and metals – ADPe [kg Sb eq.]**	8,85E-07	0,00E+00	1,09E-09	5,16E-09	1,35E-10	-3,37E-07
Resource use, fossils – ADPf [MJ]**	5,52E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,84E+01
Water use - WU [m^3 world equiv.]**	1,86E+00	0,00E+00	1,17E-04	4,24E-03	1,44E-04	-2,23E-01
Eutrophication, freshwater [kg PO34 eq.]	1,30E-05	0,00E+00	1,19E-07	1,70E-07	6,84E-09	-2,06E-06
Additional indicator required by PCRs	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate change - GWP-GHG [kg CO2 eq.]	4,47E+00	-	-	-	-	-

* The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.

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

Table 7 Characterised results for 6060, painted, 1 kg

6060 - painted						
Core impacts indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate Change – total - GWPtot [kg CO2 eq.]	4,29E+00	0,00E+00	1,30E-02	1,90E-02	1,28E-03	-1,43E+00
Climate Change, fossil - GWPf [kg CO2 eq.]	4,19E+00	0,00E+00	1,29E-02	1,89E-02	1,31E-03	-1,42E+00
Climate Change, biogenic - GWPb [kg CO2 eq.]	9,49E-02	0,00E+00	-1,79E-05	1,70E-04	-3,89E-05	-2,96E-03
Climate Change, land use and land use change - GWPluc [kg CO2 eq.]	1,11E-03	0,00E+00	7,24E-05	4,01E-06	2,42E-06	-2,56E-04
Ozone depletion - ODP [kg CFC-11 eq.]	9,68E-12	0,00E+00	7,78E-16	2,77E-13	3,09E-15	-1,07E-11
Acidification – AP [Mole of H+ eq.]	1,96E-02	0,00E+00	7,65E-05	4,13E-05	9,31E-06	-8,27E-03
Eutrophication, freshwater – Epfr [kg P eq.]*	4,30E-06	0,00E+00	3,88E-08	5,53E-08	2,23E-09	-6,35E-07
Eutrophication, marine - EPmar [kg N eq.]	4,34E-03	0,00E+00	3,75E-05	9,29E-06	2,38E-06	-1,19E-03
Eutrophication, terrestrial – Epter [Mole of N eq.]	4,73E-02	0,00E+00	4,15E-04	9,74E-05	2,62E-05	-1,30E-02
Photochemical ozone formation, human health – POCP [kg NMVOC eq.]	1,26E-02	0,00E+00	7,22E-05	2,51E-05	7,23E-06	-3,60E-03
Resource use, mineral and metals – ADPe [kg Sb eq.]**	8,57E-07	0,00E+00	1,09E-09	5,16E-09	1,35E-10	-3,20E-07
Resource use, fossils – ADPf [MJ]**	5,15E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,75E+01
Water use - WU [m^3 world equiv.]**	1,28E+00	0,00E+00	1,17E-04	4,24E-03	1,44E-04	-2,11E-01
Eutrophication, freshwater [kg PO34 eq.]	1,32E-05	0,00E+00	1,19E-07	1,70E-07	6,84E-09	-1,95E-06
Additional indicator required by PCRs	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate change - GWP-GHG [kg CO2 eq.]	4,19E+00	-	-	-	-	-

* The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.

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

Table 8 Characterised results for 6060, machined, 1 kg

6060 - machined						
Core impacts indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate Change – total - GWPtot [kg CO2 eq.]	3,53E+00	0,00E+00	1,30E-02	1,90E-02	1,28E-03	-1,51E+00
Climate Change, fossil - GWPf [kg CO2 eq.]	3,43E+00	0,00E+00	1,29E-02	1,89E-02	1,31E-03	-1,50E+00
Climate Change, biogenic - GWPb [kg CO2 eq.]	9,88E-02	0,00E+00	-1,79E-05	1,70E-04	-3,89E-05	-3,12E-03
Climate Change, land use and land use change - GWPluc [kg CO2 eq.]	1,04E-03	0,00E+00	7,24E-05	4,01E-06	2,42E-06	-2,71E-04
Ozone depletion - ODP [kg CFC-11 eq.]	5,56E-12	0,00E+00	7,78E-16	2,77E-13	3,09E-15	-1,13E-11
Acidification – AP [Mole of H+ eq.]	1,91E-02	0,00E+00	7,65E-05	4,13E-05	9,31E-06	-8,74E-03
Eutrophication, freshwater – Epfr [kg P eq.]*	3,57E-06	0,00E+00	3,88E-08	5,53E-08	2,23E-09	-6,71E-07
Eutrophication, marine - EPmar [kg N eq.]	4,03E-03	0,00E+00	3,75E-05	9,29E-06	2,38E-06	-1,26E-03
Eutrophication, terrestrial – Epter [Mole of N eq.]	4,40E-02	0,00E+00	4,15E-04	9,74E-05	2,62E-05	-1,38E-02
Photochemical ozone formation, human health – POCP [kg NMVOC eq.]	1,16E-02	0,00E+00	7,22E-05	2,51E-05	7,23E-06	-3,80E-03
Resource use, mineral and metals – ADPe [kg Sb eq.]**	7,89E-07	0,00E+00	1,09E-09	5,16E-09	1,35E-10	-3,37E-07
Resource use, fossils – ADPf [MJ]**	3,85E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,84E+01
Water use - WU [m^3 world equiv.]**	9,98E-01	0,00E+00	1,17E-04	4,24E-03	1,44E-04	-2,23E-01
Eutrophication, freshwater [kg PO34 eq.]	1,10E-05	0,00E+00	1,19E-07	1,70E-07	6,84E-09	-2,06E-06
Additional indicator required by PCRs	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate change - GWP-GHG [kg CO2 eq.]	3,43E+00	-	-	-	-	-

* The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.

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

Table 9 Characterised results for 6060, thermal break, 1 kg

6060 – thermal break						
Core impacts indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate Change – total - GWPtot [kg CO2 eq.]	3,73E+00	0,00E+00	1,30E-02	1,90E-02	1,28E-03	-1,46E+00
Climate Change, fossil - GWPf [kg CO2 eq.]	3,64E+00	0,00E+00	1,29E-02	1,89E-02	1,31E-03	-1,45E+00
Climate Change, biogenic - GWPb [kg CO2 eq.]	9,21E-02	0,00E+00	-1,79E-05	1,70E-04	-3,89E-05	-3,02E-03
Climate Change, land use and land use change - GWPluc [kg CO2 eq.]	9,90E-04	0,00E+00	7,24E-05	4,01E-06	2,42E-06	-2,62E-04
Ozone depletion - ODP [kg CFC-11 eq.]	7,42E-12	0,00E+00	7,78E-16	2,77E-13	3,09E-15	-1,09E-11
Acidification – AP [Mole of H+ eq.]	1,83E-02	0,00E+00	7,65E-05	4,13E-05	9,31E-06	-8,45E-03
Eutrophication, freshwater – Epfr [kg P eq.]*	3,75E-06	0,00E+00	3,88E-08	5,53E-08	2,23E-09	-6,49E-07
Eutrophication, marine - EPmar [kg N eq.]	3,93E-03	0,00E+00	3,75E-05	9,29E-06	2,38E-06	-1,22E-03
Eutrophication, terrestrial – Epter [Mole of N eq.]	4,28E-02	0,00E+00	4,15E-04	9,74E-05	2,62E-05	-1,33E-02
Photochemical ozone formation, human health – POCP [kg NMVOC eq.]	1,14E-02	0,00E+00	7,22E-05	2,51E-05	7,23E-06	-3,68E-03
Resource use, mineral and metals – ADPe [kg Sb eq.]**	7,90E-07	0,00E+00	1,09E-09	5,16E-09	1,35E-10	-3,26E-07
Resource use, fossils – ADPf [MJ]**	4,36E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,78E+01
Water use - WU [m^3 world equiv.]**	7,70E-01	0,00E+00	1,17E-04	4,24E-03	1,44E-04	-2,15E-01
Eutrophication, freshwater [kg PO34 eq.]	1,15E-05	0,00E+00	1,19E-07	1,70E-07	6,84E-09	-1,99E-06
Additional indicator required by PCRs	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate change - GWP-GHG [kg CO2 eq.]	3,64E+00	-	-	-	-	-

* The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.

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

Table 10 Characterised results for 6060, thermal break anodised, 1 kg

6060 – thermal break anodised						
Core impacts indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate Change – total - GWPtot [kg CO2 eq.]	5,06E+00	0,00E+00	1,30E-02	1,90E-02	1,28E-03	-1,46E+00
Climate Change, fossil - GWPf [kg CO2 eq.]	4,95E+00	0,00E+00	1,29E-02	1,89E-02	1,31E-03	-1,45E+00
Climate Change, biogenic - GWPb [kg CO2 eq.]	1,01E-01	0,00E+00	-1,79E-05	1,70E-04	-3,89E-05	-3,02E-03
Climate Change, land use and land use change - GWPluc [kg CO2 eq.]	1,22E-03	0,00E+00	7,24E-05	4,01E-06	2,42E-06	-2,62E-04
Ozone depletion - ODP [kg CFC-11 eq.]	1,42E-11	0,00E+00	7,78E-16	2,77E-13	3,09E-15	-1,09E-11
Acidification – AP [Mole of H+ eq.]	2,07E-02	0,00E+00	7,65E-05	4,13E-05	9,31E-06	-8,45E-03
Eutrophication, freshwater – Epfr [kg P eq.]*	4,95E-06	0,00E+00	3,88E-08	5,53E-08	2,23E-09	-6,49E-07
Eutrophication, marine - EPmar [kg N eq.]	4,69E-03	0,00E+00	3,75E-05	9,29E-06	2,38E-06	-1,22E-03
Eutrophication, terrestrial – Epter [Mole of N eq.]	5,12E-02	0,00E+00	4,15E-04	9,74E-05	2,62E-05	-1,33E-02
Photochemical ozone formation, human health – POCP [kg NMVOC eq.]	1,36E-02	0,00E+00	7,22E-05	2,51E-05	7,23E-06	-3,68E-03
Resource use, mineral and metals – ADPe [kg Sb eq.]**	9,37E-07	0,00E+00	1,09E-09	5,16E-09	1,35E-10	-3,26E-07
Resource use, fossils – ADPf [MJ]**	6,36E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,78E+01
Water use - WU [m^3 world equiv.]**	1,85E+00	0,00E+00	1,17E-04	4,24E-03	1,44E-04	-2,15E-01
Eutrophication, freshwater [kg PO34 eq.]	1,52E-05	0,00E+00	1,19E-07	1,70E-07	6,84E-09	-1,99E-06
Additional indicator required by PCRs	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate change - GWP-GHG [kg CO2 eq.]	4,95E+00	-	-	-	-	-

* The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.

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

Table 11 Characterised results for 6060, thermal break painted, 1 kg

6060 – thermal break painted						
Core impacts indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate Change – total - GWPtot [kg CO2 eq.]	4,78E+00	0,00E+00	1,30E-02	1,90E-02	1,28E-03	-1,38E+00
Climate Change, fossil - GWPf [kg CO2 eq.]	4,68E+00	0,00E+00	1,29E-02	1,89E-02	1,31E-03	-1,37E+00
Climate Change, biogenic - GWPb [kg CO2 eq.]	9,75E-02	0,00E+00	-1,79E-05	1,70E-04	-3,89E-05	-2,86E-03
Climate Change, land use and land use change - GWPluc [kg CO2 eq.]	1,19E-03	0,00E+00	7,24E-05	4,01E-06	2,42E-06	-2,48E-04
Ozone depletion - ODP [kg CFC-11 eq.]	1,32E-11	0,00E+00	7,78E-16	2,77E-13	3,09E-15	-1,03E-11
Acidification – AP [Mole of H+ eq.]	2,01E-02	0,00E+00	7,65E-05	4,13E-05	9,31E-06	-7,99E-03
Eutrophication, freshwater – Epfr [kg P eq.]*	5,02E-06	0,00E+00	3,88E-08	5,53E-08	2,23E-09	-6,13E-07
Eutrophication, marine - EPmar [kg N eq.]	4,60E-03	0,00E+00	3,75E-05	9,29E-06	2,38E-06	-1,15E-03
Eutrophication, terrestrial – Epter [Mole of N eq.]	5,01E-02	0,00E+00	4,15E-04	9,74E-05	2,62E-05	-1,26E-02
Photochemical ozone formation, human health – POCP [kg NMVOC eq.]	1,35E-02	0,00E+00	7,22E-05	2,51E-05	7,23E-06	-3,48E-03
Resource use, mineral and metals – ADPe [kg Sb eq.]**	9,09E-07	0,00E+00	1,09E-09	5,16E-09	1,35E-10	-3,09E-07
Resource use, fossils – ADPf [MJ]**	6,01E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,69E+01
Water use - WU [m^3 world equiv.]**	1,29E+00	0,00E+00	1,17E-04	4,24E-03	1,44E-04	-2,04E-01
Eutrophication, freshwater [kg PO34 eq.]	1,54E-05	0,00E+00	1,19E-07	1,70E-07	6,84E-09	-1,88E-06
Additional indicator required by PCRs	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate change - GWP-GHG [kg CO2 eq.]	4,68E+00	-	-	-	-	-

* The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.

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

3.6 PARAMETERS DESCRIBING THE ENVIRONMENTAL IMPACT (ADDITIONAL APPROACH TO THE MODELING OF PROCESS SCRAP)

In this additional approach, the pre-consumer scrap is considered a co-product of the production process from which it comes from and it is represented as primary aluminium.

Table 12 Characterised results for 6060, mill finished, 1 kg – approach "co-product" for the modelling of process scrap

6060 - mill finished – approach "co-product" for the modelling of process scrap						
Core impacts indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate Change – total - GWPtot [kg CO2 eq.]	8,52E+00	0,00E+00	1,30E-02	1,90E-02	1,28E-03	-6,06E+00
Climate Change, fossil - GWPf [kg CO2 eq.]	8,42E+00	0,00E+00	1,29E-02	1,89E-02	1,31E-03	-6,04E+00
Climate Change, biogenic - GWPb [kg CO2 eq.]	9,91E-02	0,00E+00	-1,79E-05	1,70E-04	-3,89E-05	-1,26E-02
Climate Change, land use and land use change - GWPluc [kg CO2 eq.]	1,82E-03	0,00E+00	7,24E-05	4,01E-06	2,42E-06	-1,09E-03
Ozone depletion - ODP [kg CFC-11 eq.]	4,02E-11	0,00E+00	7,78E-16	2,77E-13	3,09E-15	-4,53E-11
Acidification – AP [Mole of H+ eq.]	4,81E-02	0,00E+00	7,65E-05	4,13E-05	9,31E-06	-3,52E-02
Eutrophication, freshwater – Epfr [kg P eq.]*	5,24E-06	0,00E+00	3,88E-08	5,53E-08	2,23E-09	-2,70E-06
Eutrophication, marine - EPmar [kg N eq.]	7,73E-03	0,00E+00	3,75E-05	9,29E-06	2,38E-06	-5,07E-03
Eutrophication, terrestrial – Epter [Mole of N eq.]	8,43E-02	0,00E+00	4,15E-04	9,74E-05	2,62E-05	-5,54E-02
Photochemical ozone formation, human health – POCP [kg NMVOC eq.]	2,30E-02	0,00E+00	7,22E-05	2,51E-05	7,23E-06	-1,53E-02
Resource use, mineral and metals – ADPe [kg Sb eq.]**	1,74E-06	0,00E+00	1,09E-09	5,16E-09	1,35E-10	-1,36E-06
Resource use, fossils – ADPf [MJ]**	9,85E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-7,41E+01
Water use - WU [m^3 world equiv.]**	1,51E+00	0,00E+00	1,17E-04	4,24E-03	1,44E-04	-8,96E-01

* The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.

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

Table 13 Characterised results for 6060, anodised, 1 kg – approach "co-product" for the modelling of process scrap

6060 - anodised – approach "co-product" for the modelling of process scrap						
Core impacts indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate Change – total - GWPtot [kg CO2 eq.]	9,86E+00	0,00E+00	1,30E-02	1,90E-02	1,28E-03	-6,06E+00
Climate Change, fossil - GWPf [kg CO2 eq.]	9,75E+00	0,00E+00	1,29E-02	1,89E-02	1,31E-03	-6,04E+00
Climate Change, biogenic - GWPb [kg CO2 eq.]	1,09E-01	0,00E+00	-1,79E-05	1,70E-04	-3,89E-05	-1,26E-02
Climate Change, land use and land use change - GWPluc [kg CO2 eq.]	2,05E-03	0,00E+00	7,24E-05	4,01E-06	2,42E-06	-1,09E-03
Ozone depletion - ODP [kg CFC-11 eq.]	4,72E-11	0,00E+00	7,78E-16	2,77E-13	3,09E-15	-4,53E-11
Acidification – AP [Mole of H+ eq.]	5,08E-02	0,00E+00	7,65E-05	4,13E-05	9,31E-06	-3,52E-02
Eutrophication, freshwater – Epfr [kg P eq.]*	6,47E-06	0,00E+00	3,88E-08	5,53E-08	2,23E-09	-2,70E-06
Eutrophication, marine - EPmar [kg N eq.]	8,84E-03	0,00E+00	3,75E-05	9,29E-06	2,38E-06	-5,07E-03
Eutrophication, terrestrial – Epter [Mole of N eq.]	9,65E-02	0,00E+00	4,15E-04	9,74E-05	2,62E-05	-5,54E-02
Photochemical ozone formation, human health – POCP [kg NMVOC eq.]	2,61E-02	0,00E+00	7,22E-05	2,51E-05	7,23E-06	-1,53E-02
Resource use, mineral and metals – ADPe [kg Sb eq.]**	1,87E-06	0,00E+00	1,09E-09	5,16E-09	1,35E-10	-1,36E-06
Resource use, fossils – ADPf [MJ]**	1,19E+02	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-7,41E+01
Water use - WU [m^3 world equiv.]**	2,61E+00	0,00E+00	1,17E-04	4,24E-03	1,44E-04	-8,96E-01

* The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.
** The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Table 14 Characterised results for 6060, painted, 1 kg – approach "co-product" for the modelling of process scrap

6060 - painted – approach "co-product" for the modelling of process scrap						
Core impacts indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate Change – total - GWPtot [kg CO2 eq.]	9,61E+00	0,00E+00	1,30E-02	1,90E-02	1,28E-03	-5,74E+00
Climate Change, fossil - GWPf [kg CO2 eq.]	9,51E+00	0,00E+00	1,29E-02	1,89E-02	1,31E-03	-5,72E+00
Climate Change, biogenic - GWPb [kg CO2 eq.]	1,05E-01	0,00E+00	-1,79E-05	1,70E-04	-3,89E-05	-1,19E-02
Climate Change, land use and land use change - GWPluc [kg CO2 eq.]	2,03E-03	0,00E+00	7,24E-05	4,01E-06	2,42E-06	-1,03E-03
Ozone depletion - ODP [kg CFC-11 eq.]	4,61E-11	0,00E+00	7,78E-16	2,77E-13	3,09E-15	-4,29E-11
Acidification – AP [Mole of H+ eq.]	5,05E-02	0,00E+00	7,65E-05	4,13E-05	9,31E-06	-3,33E-02
Eutrophication, freshwater – Epfr [kg P eq.]*	6,55E-06	0,00E+00	3,88E-08	5,53E-08	2,23E-09	-2,55E-06
Eutrophication, marine - EPmar [kg N eq.]	8,79E-03	0,00E+00	3,75E-05	9,29E-06	2,38E-06	-4,80E-03
Eutrophication, terrestrial – Epter [Mole of N eq.]	9,59E-02	0,00E+00	4,15E-04	9,74E-05	2,62E-05	-5,25E-02
Photochemical ozone formation, human health – POCP [kg NMVOC eq.]	2,61E-02	0,00E+00	7,22E-05	2,51E-05	7,23E-06	-1,45E-02
Resource use, mineral and metals – ADPe [kg Sb eq.]**	1,86E-06	0,00E+00	1,09E-09	5,16E-09	1,35E-10	-1,29E-06
Resource use, fossils – ADPf [MJ]**	1,16E+02	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-7,02E+01
Water use - WU [m^3 world equiv.]**	2,04E+00	0,00E+00	1,17E-04	4,24E-03	1,44E-04	-8,48E-01

* The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.
** The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Table 15 Characterised results for 6060, machined, 1 kg – approach "co-product" for the modelling of process scrap

6060 – machined – approach "co-product" for the modelling of process scrap						
Core impacts indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate Change – total - GWPtot [kg CO2 eq.]	8,77E+00	0,00E+00	1,30E-02	1,90E-02	1,28E-03	-6,06E+00
Climate Change, fossil - GWPf [kg CO2 eq.]	8,66E+00	0,00E+00	1,29E-02	1,89E-02	1,31E-03	-6,04E+00
Climate Change, biogenic - GWPb [kg CO2 eq.]	1,08E-01	0,00E+00	-1,79E-05	1,70E-04	-3,89E-05	-1,26E-02
Climate Change, land use and land use change - GWPluc [kg CO2 eq.]	1,94E-03	0,00E+00	7,24E-05	4,01E-06	2,42E-06	-1,09E-03
Ozone depletion - ODP [kg CFC-11 eq.]	4,19E-11	0,00E+00	7,78E-16	2,77E-13	3,09E-15	-4,53E-11
Acidification – AP [Mole of H+ eq.]	4,94E-02	0,00E+00	7,65E-05	4,13E-05	9,31E-06	-3,52E-02
Eutrophication, freshwater – Epfr [kg P eq.]*	5,79E-06	0,00E+00	3,88E-08	5,53E-08	2,23E-09	-2,70E-06
Eutrophication, marine - EPmar [kg N eq.]	8,40E-03	0,00E+00	3,75E-05	9,29E-06	2,38E-06	-5,07E-03
Eutrophication, terrestrial – Epter [Mole of N eq.]	9,17E-02	0,00E+00	4,15E-04	9,74E-05	2,62E-05	-5,54E-02
Photochemical ozone formation, human health – POCP [kg NMVOC eq.]	2,48E-02	0,00E+00	7,22E-05	2,51E-05	7,23E-06	-1,53E-02
Resource use, mineral and metals – ADPe [kg Sb eq.]**	1,77E-06	0,00E+00	1,09E-09	5,16E-09	1,35E-10	-1,36E-06
Resource use, fossils – ADPf [MJ]**	1,02E+02	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-7,41E+01
Water use - WU [m^3 world equiv.]**	1,74E+00	0,00E+00	1,17E-04	4,24E-03	1,44E-04	-8,96E-01

* The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.
** The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Table 16 Characterised results for 6060, thermal break, 1 kg – approach "co-product" for the modelling of process scrap

6060 - thermal break – approach "co-product" for the modelling of process scrap						
Core impacts indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate Change – total - GWPtot [kg CO2 eq.]	8,89E+00	0,00E+00	1,30E-02	1,90E-02	1,28E-03	-5,86E+00
Climate Change, fossil - GWPf [kg CO2 eq.]	8,79E+00	0,00E+00	1,29E-02	1,89E-02	1,31E-03	-5,85E+00
Climate Change, biogenic - GWPb [kg CO2 eq.]	1,02E-01	0,00E+00	-1,79E-05	1,70E-04	-3,89E-05	-1,22E-02
Climate Change, land use and land use change - GWPluc [kg CO2 eq.]	1,88E-03	0,00E+00	7,24E-05	4,01E-06	2,42E-06	-1,05E-03
Ozone depletion - ODP [kg CFC-11 eq.]	4,27E-11	0,00E+00	7,78E-16	2,77E-13	3,09E-15	-4,39E-11
Acidification – AP [Mole of H+ eq.]	4,82E-02	0,00E+00	7,65E-05	4,13E-05	9,31E-06	-3,40E-02
Eutrophication, freshwater – Epfr [kg P eq.]*	5,93E-06	0,00E+00	3,88E-08	5,53E-08	2,23E-09	-2,61E-06
Eutrophication, marine - EPmar [kg N eq.]	8,24E-03	0,00E+00	3,75E-05	9,29E-06	2,38E-06	-4,90E-03
Eutrophication, terrestrial – Epter [Mole of N eq.]	8,99E-02	0,00E+00	4,15E-04	9,74E-05	2,62E-05	-5,36E-02
Photochemical ozone formation, human health – POCP [kg NMVOC eq.]	2,45E-02	0,00E+00	7,22E-05	2,51E-05	7,23E-06	-1,48E-02
Resource use, mineral and metals – ADPe [kg Sb eq.]**	1,76E-06	0,00E+00	1,09E-09	5,16E-09	1,35E-10	-1,31E-06
Resource use, fossils – ADPf [MJ]**	1,06E+02	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-7,17E+01
Water use - WU [m^3 world equiv.]**	1,50E+00	0,00E+00	1,17E-04	4,24E-03	1,44E-04	-8,67E-01

* The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.
** The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Table 17 Characterised results for 6060, thermal break anodised, 1 kg – approach "co-product" for the modelling of process scrap

6060 - thermal break anodised – approach "co-product" for the modelling of process scrap						
Core impacts indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate Change – total - GWPtot [kg CO2 eq.]	1,01E+01	0,00E+00	1,30E-02	1,90E-02	1,28E-03	-5,86E+00
Climate Change, fossil - GWPf [kg CO2 eq.]	1,00E+01	0,00E+00	1,29E-02	1,89E-02	1,31E-03	-5,85E+00
Climate Change, biogenic - GWPb [kg CO2 eq.]	1,11E-01	0,00E+00	-1,79E-05	1,70E-04	-3,89E-05	-1,22E-02
Climate Change, land use and land use change - GWPluc [kg CO2 eq.]	2,10E-03	0,00E+00	7,24E-05	4,01E-06	2,42E-06	-1,05E-03
Ozone depletion - ODP [kg CFC-11 eq.]	4,94E-11	0,00E+00	7,78E-16	2,77E-13	3,09E-15	-4,39E-11
Acidification – AP [Mole of H+ eq.]	5,01E-02	0,00E+00	7,65E-05	4,13E-05	9,31E-06	-3,40E-02
Eutrophication, freshwater – Epfr [kg P eq.]*	7,10E-06	0,00E+00	3,88E-08	5,53E-08	2,23E-09	-2,61E-06
Eutrophication, marine - EPmar [kg N eq.]	8,93E-03	0,00E+00	3,75E-05	9,29E-06	2,38E-06	-4,90E-03
Eutrophication, terrestrial – Epter [Mole of N eq.]	9,75E-02	0,00E+00	4,15E-04	9,74E-05	2,62E-05	-5,36E-02
Photochemical ozone formation, human health – POCP [kg NMVOC eq.]	2,64E-02	0,00E+00	7,22E-05	2,51E-05	7,23E-06	-1,48E-02
Resource use, mineral and metals – ADPe [kg Sb eq.]**	1,89E-06	0,00E+00	1,09E-09	5,16E-09	1,35E-10	-1,31E-06
Resource use, fossils – ADPf [MJ]**	1,25E+02	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-7,17E+01
Water use - WU [m^3 world equiv.]**	2,57E+00	0,00E+00	1,17E-04	4,24E-03	1,44E-04	-8,67E-01

* The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.
** The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

Table 18 Characterised results for 6060, thermal break painted, 1 kg – approach "co-product" for the modelling of process scrap

6060 - thermal break painted – approach "co-product" for the modelling of process scrap						
Core impacts indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Climate Change – total - GWPtot [kg CO2 eq.]	9,91E+00	0,00E+00	1,30E-02	1,90E-02	1,28E-03	-5,54E+00
Climate Change, fossil - GWPf [kg CO2 eq.]	9,80E+00	0,00E+00	1,29E-02	1,89E-02	1,31E-03	-5,53E+00
Climate Change, biogenic - GWPb [kg CO2 eq.]	1,07E-01	0,00E+00	-1,79E-05	1,70E-04	-3,89E-05	-1,15E-02
Climate Change, land use and land use change - GWPluc [kg CO2 eq.]	2,08E-03	0,00E+00	7,24E-05	4,01E-06	2,42E-06	-9,96E-04
Ozone depletion - ODP [kg CFC-11 eq.]	4,84E-11	0,00E+00	7,78E-16	2,77E-13	3,09E-15	-4,15E-11
Acidification – AP [Mole of H+ eq.]	4,99E-02	0,00E+00	7,65E-05	4,13E-05	9,31E-06	-3,21E-02
Eutrophication, freshwater – Epfr [kg P eq.]*	7,19E-06	0,00E+00	3,88E-08	5,53E-08	2,23E-09	-2,47E-06
Eutrophication, marine - EPmar [kg N eq.]	8,89E-03	0,00E+00	3,75E-05	9,29E-06	2,38E-06	-4,64E-03
Eutrophication, terrestrial – Epter [Mole of N eq.]	9,69E-02	0,00E+00	4,15E-04	9,74E-05	2,62E-05	-5,06E-02
Photochemical ozone formation, human health – POCP [kg NMVOC eq.]	2,64E-02	0,00E+00	7,22E-05	2,51E-05	7,23E-06	-1,40E-02
Resource use, mineral and metals – ADPe [kg Sb eq.]**	1,87E-06	0,00E+00	1,09E-09	5,16E-09	1,35E-10	-1,24E-06
Resource use, fossils – ADPf [MJ]**	1,22E+02	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-6,78E+01
Water use - WU [m^3 world equiv.]**	2,02E+00	0,00E+00	1,17E-04	4,24E-03	1,44E-04	-8,19E-01

* The results in kg P eq. can be obtained by dividing the results in kg PO4 eq. by a factor of 3,07.
** The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

3.7 INDICATORS OF RESOURCES USE, WASTE AND OUTPUT FLOWS, BIOGENIC CONTENT

The LCI indicators are calculated using the Method EN15804+A2 implemented in Gabi software.

6060 – mill finished						
Resource use indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Use of renewable primary energy (PERE) [MJ]	1,31E+01	0,00E+00	9,87E-03	1,90E-01	2,58E-03	-8,36E+00
Primary energy resources used as raw materials (PERM) [MJ]	5,66E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (PERT) [MJ]	1,36E+01	0,00E+00	9,87E-03	1,90E-01	2,58E-03	-8,36E+00
Use of non-renewable primary energy (PENRE) [MJ]	3,38E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,84E+01
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	2,82E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (PENRT) [MJ]	3,41E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,84E+01
Input of secondary material (SM) [kg]	7,99E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non renewable secondary fuels (NRSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW) [m3]	4,42E-02	0,00E+00	1,12E-05	1,80E-04	4,37E-06	-2,12E-02
Output flows and waste categories	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed (HWD) [kg]	2,56E-08	0,00E+00	8,33E-13	2,96E-11	8,85E-13	-1,30E-08
Non-hazardous waste disposed (NHWD) [kg]	7,75E-01	0,00E+00	2,49E-05	2,58E-04	8,81E-02	-4,50E-01
Radioactive waste disposed (RWD) [kg]	3,34E-04	0,00E+00	2,14E-07	5,45E-05	1,92E-07	-1,10E-03
Components for re-use (CRU) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for Recycling (MFR) [kg]	4,49E-01	1,00E+00	9,60E-01	9,12E-01	0,00E+00	0,00E+00
Material for Energy Recovery (MER) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE) [MJ]	2,03E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (EET) [MJ]	3,65E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biogenic carbon content	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Biogenic carbon content in packaging [kg]*	2,43E-02	-	-	-	-	-

*1 kg biogenic carbon is equivalent to 44/12 kg CO_2. The mass of biogenic carbon containing materials in the products is less than 5%.

6060 – anodised						
Ressource use indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Use of renewable primary energy (PERE) [MJ]	1,65E+01	0,00E+00	9,87E-03	1,90E-01	2,58E-03	-8,36E+00
Primary energy resources used as raw materials (PERM) [MJ]	1,22E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (PERT) [MJ]	1,77E+01	0,00E+00	9,87E-03	1,90E-01	2,58E-03	-8,36E+00
Use of non-renewable primary energy (PENRE) [MJ]	5,49E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,84E+01
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	4,71E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (PENRT) [MJ]	5,54E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,84E+01
Input of secondary material (SM) [kg]	7,99E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non renewable secondary fuels (NRSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW) [m3]	7,06E-02	0,00E+00	1,12E-05	1,80E-04	4,37E-06	-2,12E-02
Output flows and waste categories	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed (HWD) [kg]	3,36E-07	0,00E+00	8,33E-13	2,96E-11	8,85E-13	-1,30E-08
Non-hazardous waste disposed (NHWD) [kg]	8,90E-01	0,00E+00	2,49E-05	2,58E-04	8,81E-02	-4,50E-01
Radioactive waste disposed (RWD) [kg]	9,47E-04	0,00E+00	2,14E-07	5,45E-05	1,92E-07	-1,10E-03
Components for re-use (CRU) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for Recycling (MFR) [kg]	6,48E-01	1,00E+00	9,60E-01	9,12E-01	0,00E+00	0,00E+00
Material for Energy Recovery (MER) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE) [MJ]	9,37E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (EET) [MJ]	1,68E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biogenic carbon content	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Biogenic carbon content in packaging [kg]*	4,66E-02	-	-	-	-	-

*1 kg biogenic carbon is equivalent to 44/12 kg CO_2. The mass of biogenic carbon containing materials in the products is less than 5%.

6060 - painted						
Ressource use indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Use of renewable primary energy (PERE) [MJ]	1,57E+01	0,00E+00	9,87E-03	1,90E-01	2,58E-03	-7,92E+00
Primary energy resources used as raw materials (PERM) [MJ]	1,21E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (PERT) [MJ]	1,69E+01	0,00E+00	9,87E-03	1,90E-01	2,58E-03	-7,92E+00
Use of non-renewable primary energy (PENRE) [MJ]	5,12E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,75E+01
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	4,65E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (PENRT) [MJ]	5,17E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,75E+01
Input of secondary material (SM) [kg]	7,99E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non renewable secondary fuels (NRSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW) [m3]	5,76E-02	0,00E+00	1,12E-05	1,80E-04	4,37E-06	-2,00E-02
Output flows and waste categories	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed (HWD) [kg]	5,63E-06	0,00E+00	8,33E-13	2,96E-11	8,85E-13	-1,23E-08
Non-hazardous waste disposed (NHWD) [kg]	8,93E-01	0,00E+00	2,49E-05	2,58E-04	8,81E-02	-4,26E-01
Radioactive waste disposed (RWD) [kg]	7,28E-04	0,00E+00	2,14E-07	5,45E-05	1,92E-07	-1,04E-03
Components for re-use (CRU) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for Recycling (MFR) [kg]	4,79E-01	1,00E+00	9,60E-01	9,12E-01	0,00E+00	0,00E+00
Material for Energy Recovery (MER) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE) [MJ]	9,32E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (EET) [MJ]	1,67E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biogenic carbon content	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Biogenic carbon content in packaging [kg]*	4,60E-02	-	-	-	-	-

*1 kg biogenic carbon is equivalent to 44/12 kg CO_2. The mass of biogenic carbon containing materials in the products is less than 5%.

6060 - machined						
Ressource use indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Use of renewable primary energy (PERE) [MJ]	1,44E+01	0,00E+00	9,87E-03	1,90E-01	2,58E-03	-8,36E+00
Primary energy resources used as raw materials (PERM) [MJ]	1,23E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (PERT) [MJ]	1,57E+01	0,00E+00	9,87E-03	1,90E-01	2,58E-03	-8,36E+00
Use of non-renewable primary energy (PENRE) [MJ]	3,82E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,84E+01
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	4,76E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (PENRT) [MJ]	3,86E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,84E+01
Input of secondary material (SM) [kg]	7,99E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non renewable secondary fuels (NRSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW) [m3]	5,11E-02	0,00E+00	1,12E-05	1,80E-04	4,37E-06	-2,12E-02
Output flows and waste categories	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed (HWD) [kg]	3,34E-08	0,00E+00	8,33E-13	2,96E-11	8,85E-13	-1,30E-08
Non-hazardous waste disposed (NHWD) [kg]	8,93E-01	0,00E+00	2,49E-05	2,58E-04	8,81E-02	-4,50E-01
Radioactive waste disposed (RWD) [kg]	4,34E-04	0,00E+00	2,14E-07	5,45E-05	1,92E-07	-1,10E-03
Components for re-use (CRU) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for Recycling (MFR) [kg]	5,40E-01	1,00E+00	9,60E-01	9,12E-01	0,00E+00	0,00E+00
Material for Energy Recovery (MER) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE) [MJ]	9,41E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (EET) [MJ]	1,69E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biogenic carbon content	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Biogenic carbon content in packaging [kg]*	4,71E-02	-	-	-	-	-

*1 kg biogenic carbon is equivalent to 44/12 kg CO_2. The mass of biogenic carbon containing materials in the products is less than 5%.

6060 – thermal break						
Ressource use indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Use of renewable primary energy (PERE) [MJ]	1,44E+01	0,00E+00	9,87E-03	1,90E-01	2,58E-03	-8,09E+00
Primary energy resources used as raw materials (PERM) [MJ]	1,19E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (PERT) [MJ]	1,56E+01	0,00E+00	9,87E-03	1,90E-01	2,58E-03	-8,09E+00
Use of non-renewable primary energy (PENRE) [MJ]	4,33E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,78E+01
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	4,55E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (PENRT) [MJ]	4,37E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,78E+01
Input of secondary material (SM) [kg]	7,73E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non renewable secondary fuels (NRSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW) [m3]	4,49E-02	0,00E+00	1,12E-05	1,80E-04	4,37E-06	-2,05E-02
Output flows and waste categories	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed (HWD) [kg]	2,88E-08	0,00E+00	8,33E-13	2,96E-11	8,85E-13	-1,26E-08
Non-hazardous waste disposed (NHWD) [kg]	8,46E-01	0,00E+00	2,49E-05	2,58E-04	8,81E-02	-4,35E-01
Radioactive waste disposed (RWD) [kg]	5,77E-04	0,00E+00	2,14E-07	5,45E-05	1,92E-07	-1,06E-03
Components for re-use (CRU) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for Recycling (MFR) [kg]	4,63E-01	1,00E+00	9,60E-01	9,12E-01	0,00E+00	0,00E+00
Material for Energy Recovery (MER) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE) [MJ]	9,26E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (EET) [MJ]	1,66E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biogenic carbon content	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Biogenic carbon content in packaging [kg]*	4,52E-02	-	-	-	-	-

*1 kg biogenic carbon is equivalent to 44/12 kg CO_2. The mass of biogenic carbon containing materials in the products is less than 5%.

6060 – thermal break anodised						
Ressource use indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Use of renewable primary energy (PERE) [MJ]	1,77E+01	0,00E+00	9,87E-03	1,90E-01	2,58E-03	-8,09E+00
Primary energy resources used as raw materials (PERM) [MJ]	1,83E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (PERT) [MJ]	1,95E+01	0,00E+00	9,87E-03	1,90E-01	2,58E-03	-8,09E+00
Use of non-renewable primary energy (PENRE) [MJ]	6,31E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,78E+01
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	6,38E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (PENRT) [MJ]	6,38E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,78E+01
Input of secondary material (SM) [kg]	7,73E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non renewable secondary fuels (NRSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW) [m3]	7,05E-02	0,00E+00	1,12E-05	1,80E-04	4,37E-06	-2,05E-02
Output flows and waste categories	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed (HWD) [kg]	3,29E-07	0,00E+00	8,33E-13	2,96E-11	8,85E-13	-1,26E-08
Non-hazardous waste disposed (NHWD) [kg]	9,57E-01	0,00E+00	2,49E-05	2,58E-04	8,81E-02	-4,35E-01
Radioactive waste disposed (RWD) [kg]	1,17E-03	0,00E+00	2,14E-07	5,45E-05	1,92E-07	-1,06E-03
Components for re-use (CRU) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for Recycling (MFR) [kg]	6,55E-01	1,00E+00	9,60E-01	9,12E-01	0,00E+00	0,00E+00
Material for Energy Recovery (MER) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE) [MJ]	1,64E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (EET) [MJ]	2,94E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biogenic carbon content	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Biogenic carbon content in packaging [kg]*	6,68E-02	-	-	-	-	-

*1 kg biogenic carbon is equivalent to 44/12 kg CO_2. The mass of biogenic carbon containing materials in the products is less than 5%.

6060 – thermal break painted						
Ressource use indicators	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Use of renewable primary energy (PERE) [MJ]	1,69E+01	0,00E+00	9,87E-03	1,90E-01	2,58E-03	-7,65E+00
Primary energy resources used as raw materials (PERM) [MJ]	1,81E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renewable primary energy resources (PERT) [MJ]	1,87E+01	0,00E+00	9,87E-03	1,90E-01	2,58E-03	-7,65E+00
Use of non-renewable primary energy (PENRE) [MJ]	5,96E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,69E+01
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	6,32E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-renewable primary energy resources (PENRT) [MJ]	6,02E+01	0,00E+00	1,74E-01	3,42E-01	1,72E-02	-1,69E+01
Input of secondary material (SM) [kg]	7,73E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non renewable secondary fuels (NRSF) [MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW) [m3]	5,79E-02	0,00E+00	1,12E-05	1,80E-04	4,37E-06	-1,93E-02
Output flows and waste categories	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed (HWD) [kg]	5,45E-06	0,00E+00	8,33E-13	2,96E-11	8,85E-13	-1,19E-08
Non-hazardous waste disposed (NHWD) [kg]	9,60E-01	0,00E+00	2,49E-05	2,58E-04	8,81E-02	-4,11E-01
Radioactive waste disposed (RWD) [kg]	9,58E-04	0,00E+00	2,14E-07	5,45E-05	1,92E-07	-1,00E-03
Components for re-use (CRU) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for Recycling (MFR) [kg]	4,91E-01	1,00E+00	9,60E-01	9,12E-01	0,00E+00	0,00E+00
Material for Energy Recovery (MER) [kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electrical energy (EEE) [MJ]	1,63E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported thermal energy (EET) [MJ]	2,93E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Biogenic carbon content	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Biogenic carbon content in packaging [kg]*	6,63E-02	-	-	-	-	-

*1 kg biogenic carbon is equivalent to 44/12 kg CO_2. The mass of biogenic carbon containing materials in the products is less than 5%.

4 REFERENCES

Ecoinnovazione (2022). LCA report of aluminium billets produced by Fonderie pandolfo – Technical Report. 2022.

Ecoinnovazione (2022). LCA report of aluminium extruded profiles produced by Pandolfo Alluminio – Technical Report. 2022, rev. 1

EN 15804:2012+A2:2019 "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

Frischknecht R., Althaus H.J., Bauer C., Doka G. Heck T., Jungbluth N., Kellenberger D., Nemecek T. (2007). The Environmental Relevance of Capital Goods in Life Cycle Assessments of Products and Services.- International Journal of Life Cycle Assessment 12(1). DOI: 10.1065/lca2007.02.309

International EPD® System, 2019. General Programme Instructions for the International EPD System, version 4

International EPD® System, 2019. PCR 2019:14 Construction products, version 1.11

International Organisation for Standardization (ISO), 2006a Environmental management – Life Cycle assessment – Principles and framework. ISO 14040:2006/Amd 1:2020, Geneva

International Organisation for Standardization (ISO), 2006b Environmental management – Life Cycle assessment – Requirements and guidelines. ISO 14044:2006/Amd 2:2020, Geneva

International Organisation for Standardization (ISO), 2006c Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures. ISO 14025:2006, Geneva

5 ADDITIONAL INFORMATION

5.1 ADDITIONAL INFORMATION CONCERNING THE PROGRAMME AND THE EPD

EPDs within the same product category but from different programme operator may not be comparable.

EPDs of construction products may not be comparable if they do not comply with EN 15804. Environmental product declarations within the same product category from different programs may not be comparable. This EPD and the PCR 2019:14 "Construction products" are available on the website of The International EPD® System (www.environdec.com).

The verifier and the Programme Operator do not make any claim nor have any responsibility of the legality of the products included in the present EPD. The LCA study and the present EPD have been issued with the technical scientific support of Ecoinnovazione S.r.l., spin-off ENEA (http://ecoinnovazione.it/?lang=en).

5.2 ADDITIONAL INFORMATION ON THE PRODUCT AND ON THE COMPANY

Aluminium profiles covered by the present EPD are produced in Borgo Valbelluna and Feltre.

For further information on product characteristics, typical applications, technical datasheets and case histories, please visit our website https://www.pandolfoalluminio.it or contact Stefano Bedin and Paolo Vignaga (sbedin@pandolfoalluminio.com ; pvignaga@pandolfoalluminio.com)

6 VERIFICATION AND REGISTRATION

CEN standard EN 15804 served as core PCR	
EPD Programme:	The International EPD® System For more information – www.environdec.com
GPI:	General Programme Instruction 3.01
PCR:	PCR 2019:14 Construction products version 1.11
PCR review was conducted by:	The Technical Committee of the International EPD® System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec/com/contact
EPD owner	Pandolfo Allumino Spa – Via della Provvidenza 143, 35030, Sarmeola (PD), Italy https://www.pandolfoalluminio.it @: sbedin@pandolfoalluminio.com pvignaga@pandolfoalluminio.com
EPD valid within the following geographical area:	Global
Technical support:	Ecoinnovazione S.r.l. – spin-off ENEA Via della Liberazione 6, 40128 Bologna ecoinnovazione spin off ENEA www.ecoinnovazione.it
Independent verification of the declaration and data according to ISO 14025: 2006	EPD verification (external)
Third party verifier:	TUV Italia Sesto S.Giovanni (MI) - via Carducci, 125 pal.23 https://www.tuvsud.com/it-it
Accredited by:	Accredia, certificate n.006H
Procedure for follow-up during EPD validity involves third party verifier	Yes