



EPD

Environmental Product Declaration



Declaration in compliance with ISO 14025 and EN 15804:2012+A2:2019

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GENERAL INFORMATION

Program Operator	EPDItaly Via Gaetano De Castillia 10, 20124 Milano (MI), Italia www.epditaly.it
EPD Owner	novALmec S.r.l. Via Mantova, 1023 Loc. Romanore - 46034 Borgo Virgilio (MN) Tel.: +39 0376.6421 - www.novalmec.com - info@novalmec.com
Products	Aluminium billets Alloy EN AW 6060 Alloy EN AW 6063 Alloy EN AW 6005 Alloy EN AW 6082
UN CPC Code	4153 – Semi-finished products of aluminium or aluminium alloys
Production Unit	Via Petrarca, 560 Loc. Romanore - 46034 Borgo Virgilio (MN)
Independent verification	This declaration is in compliance with ISO 14025 and EN 15804:2012+A2:2019, with PCR ICMQ-001/15 and Program Guidelines of EPDItaly, Revision 5.2 of 16.02.2022. Independent external verification of the declaration and data, according to ISO 14025:2010. <input type="checkbox"/> internal <input checked="" type="checkbox"/> external Verification performed by ICMQ S.p.A., Via Gaetano De Castillia 10, 20124 Milano (MI), Italia. Accredited by ACCREDIA.
Comparability	EPDs published within the same product category, but from different Program Operators, may not be comparable. In particular, EPDs of construction products may not be comparable if they do not comply with EN 15804:2012+A2:2019.
Responsability	novALmec S.r.l. relieves EPDItaly from any non-compliance with the environmental legislation self-declared by the manufacturer himself. The declaration Owner will be responsible for the information and supporting evidence; EPDItaly declines all responsibility regarding the manufacturer's information, data and results of the life cycle assessment.
Reference documents	PCR ICMQ-001/15 – Construction products and services, Version 3 of 02.12.2019, valid until 01.12.2024; Program Guidelines of EPDItaly, Revision 5.2 of 16.02.2022.
Company contacts	novALmec S.r.l. Luca Tremea Quality Manager l.tremea@novellini.it Luca Paolo Martini Head of sales lp.martini@novalmec.com
Technical support	Development of the Life Cycle Assessment and EPD Arch. Michele Paleari – michelepaleariarch@gmail.com



novALmec is the result of the partnership of two important family-owned industrial groups: the Italian Novellini Group and the US Metal Exchange Corporation.

The Novellini Group, founded in 1966 by Gianfranco Novellini, is a market leader in the production of shower enclosures, whirlpool baths, shower trays, bathroom accessories, mini-pool columns and bathroom furniture.

The Novellini Group manufactures in Italy at Romanore di Borgoforte in the province of Mantua and has made verticalization and production sustainability the foundations of its business model.

Aluminum, a fundamental raw material in the Group's production processes, perfectly expresses the concepts of verticalization, sustainability and circularity that have always underpinned Novellini's strategic industrial development choices.

Since the mid-1990s, the group has equipped itself with two extrusion lines and a secondary aluminum foundry, later investing in green technologies for aluminum surface treatments.

The group's headquarters, production and logistics center cover an area of 250,000 m² and with its 9 sales subsidiaries in the main European countries, it employs more than 700 people.

Metal Exchange Corporation is the flagship of a US group of companies involved in the production of aluminium and other non-ferrous materials based in St Louis in the state of Missouri.

Founded in 1974 by Morris Lefton, it began as a local aluminium scrap trading company and is now a privately owned company with six production plants and sales offices in the US and international sales offices in Shanghai and Zurich.

Its business includes marketing, trading, production, processing, distribution and transportation services.

Metal Exchange has built its growth by maintaining strong long-term relationships with customers and suppliers based on trust, integrity and reliability.

COMPANY

Al is the chemical symbol for aluminium. Two simple letters from which a history is forged, a production process capable of endless renewal.

Since the second half of the nineteenth century, it has been the second most used metal in the world and, although it is a chemical element found in abundance on the earth's crust, it is our strong commitment to make the most of its main characteristic: recyclability, which together with its lightness makes it a sustainable raw material.

The novALmec logo identifies and expresses the strong connotation and vocation for sustainability that has always inspired and guided our strategic and industrial choices.



Figure 1 - novALmec plant

novALmec is the result of the joint venture between Novellini Industries, a Novellini Group company, and Metal Exchange Corporation and is able to meet the demand for secondary aluminum billets for the European market.

The smelting furnace and the aluminum scrap separation and valorization plant were designed and installed in 2002 by Novellini Industries, which then in 2019 transferred the plants and the proven experience and know-how of its team to the new company **novALmec**.

novALmec has made major investments in the plants aimed at progressively increasing the foundry's production capacity to 33,000 tons and reducing the environmental impact of the production process as much as possible.

MISSION

With enthusiasm, team work and values, we wish to improve the lives of everyone in the world in search of excellence for their homes and families, and aim to do so by using the best in technology, further enhanced by passion and intellectual involvement, born from a quest for beauty in all that we do.

VISION

To be the reference point for excellence in bathroom furnishings and the most innovative company, proposing better products and better services. To thus grow and become a leader throughout the world, creating value for the resources involved in our activity and for our country.

CORE VALUES

Our Core values are a passion for excellence - meaning a love of beauty and fine workmanship - and ethics - meaning long-term worth through sustainability, transparency and valuing people. We want to put mankind and quality of life at the centre of all our choices, ever driven by a passion for what we do.

CODE OF ETHICS

novALmec's Code of Ethics is the key tool we use to ensure a fair approach to conducting our business and guarantee transparent management of human and commercial relations.

ORGANISATIONAL MODEL 231

NovALmec has adopted an Organisational, Management and Control Model in accordance with Italian Legislative Decree 231/2001, which regulates the principle of conduct of its employees with regard to administrative liability for certain offences.

PRODUCTION

novALmec produces billets with Hot Top casting technology.

Aluminum billets, often considered raw material, are actually a semi-finished product that is used in extrusion processes to produce aluminum profiles, used in several sectors such as building and construction, furniture, automotive, industrial applications, aerospace, renewable, transportation.

The aluminium alloys produced and presented in this EPD are:

- EN AW 6060
- EN AW 6063
- EN AW 6005
- EN AW 6082

The above alloys are produced in the diameters 178, 203, 229, 254 mm (7, 8, 9, 10 inches).

The Flow chart of the billets aluminium production process is presented in Figure 3.

The incoming materials are aluminum scrap, primary aluminum ingots and master alloys such as Silicon, Magnesium, Manganese, AlTiB.

Above materials are melted in the melting furnace to produce aluminum billets.

In the novALmec plant, in addition to the casthouse, there is a facility for shredding and sorting post consumer scraps with X-Ray technology.

The aluminium scrap purchased is derived from the collection of post consumer scrap.

In the novALmec plant, in addition to the casthouse, there is a shredding and sorting plant with X-ray technology, which receives the incoming aluminum scrap derived from the collection of post-consumer scrap.



Figure 2 - novALmec billets

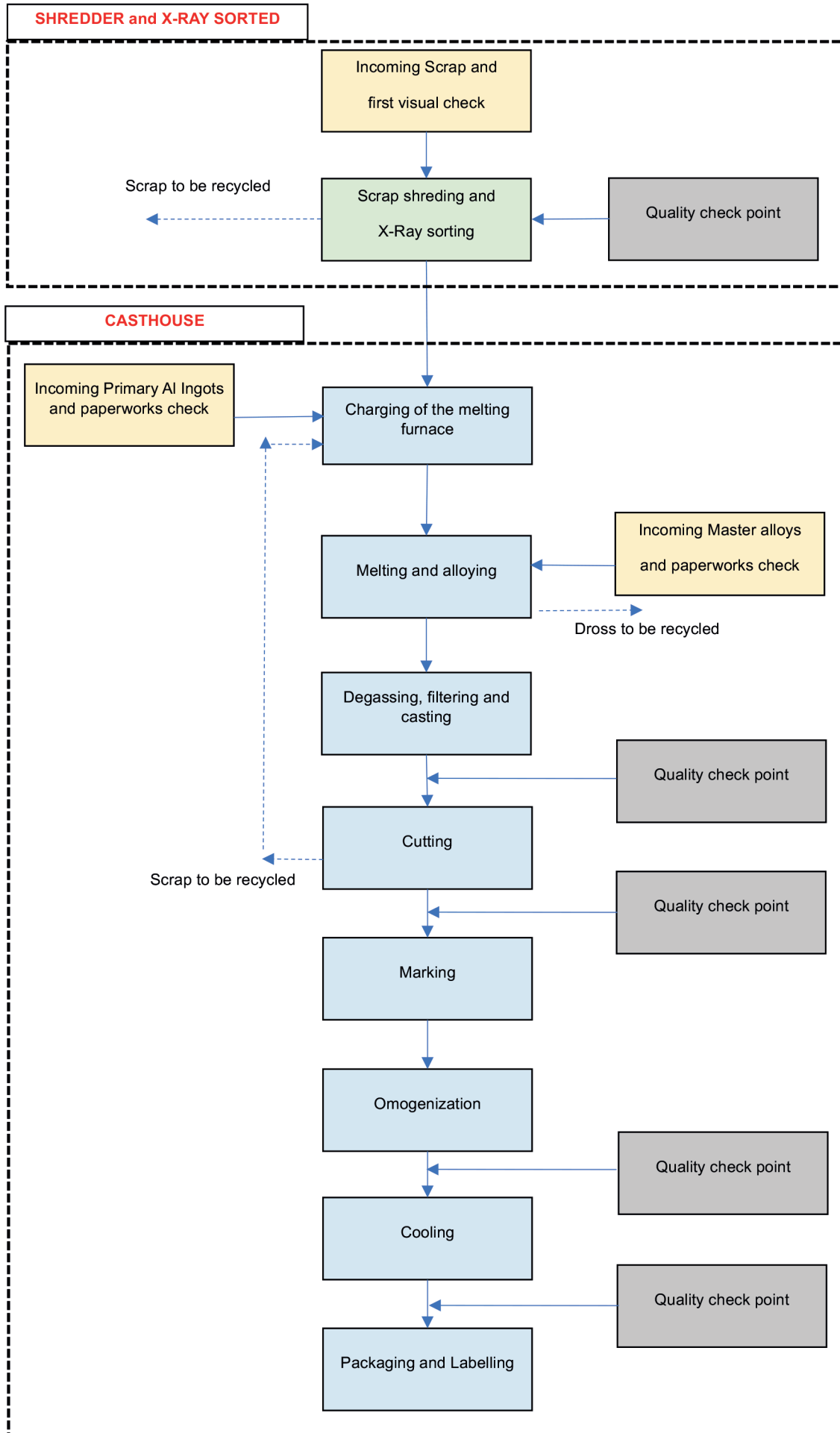


Figure 3 - Flow chart of aluminium billets production process

PRODUCT TECHNICAL CHARACTERISTICS

Production of Aluminium Billets with Hot top Molds and in line de gassing and ceramic foam filter

- Available Diameters (mm: 178, 203, 228, 254) (inches: 7, 8, 9, 10)
- Billets Length up to 6400 mm
- Alloys: 6000 series with specific focus at 6060,6063,6005,6082 with tailored chemical composition according the customers needs
- ISO 9001 Certification

TYPICAL PRODUCTION SPECIFICATIONS CHEMICALS COMPOSITION

- Alloys will be taylored according EN Norms and Customers needs
- Others Customers Alloys request can be evaluated based on Production capabilities

ALLOYS	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti
EN AW 6060	0,3-0,6	0,10-0,30	0,10	0,10	0,35-0,6	0,05	-	0,15	0,10
EN AW 6063	0,2-0,6	0,35	0,10	0,10	0,35-0,6	0,05	-	0,10	0,10
EN AW 6005	0,6-0,9	0,35	0,10	0,10	0,40-0,6	0,10	-	0,10	0,10
EN AW 6082	0,7-1,3	0,5	0,1	0,4-1,0	0,6-1,2	0,25	-	0,20	0,10

QUALITY MANAGEMENT SYSTEM

The adoption of the quality management system in accordance with ISO 9001 is a strategic decision of our organization, which intends to be a reliable partner and meet the expectations of an increasingly demanding market.

QUALITY CERTIFICATION AND CONTROL

- Billets production is strictly made according controls plans certified ISO 9001 that guarantee the respect and the record of all the critical process parameters
- Chemical analysis
- Ultrasound controls on customer's request

Billets are manufactured according to the standards:

- EN 486 "Aluminium and aluminium alloys - Extrusion ingots - Specifications"
- EN 573-3 "Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition and form of products"

The customer can request customized chemical analysis and technical specifications.

An analysis certificate according to EN 10204 is issued for each delivery

PRODUCTS

AW 6060

Alloy reference	EN AW 6060
Product description	Secondary aluminium billets alloy 6060
Product code	80003ALL, 80003ALL203, 80003ALL229, 80003ALL254
Billets Diameter (mm)	178 – 203 – 229 – 254
Lenght (mm)	from 5800 to 6400
Packaging	wood with thermal treatment (drying) and iron stripe

AW 6063

Alloy reference	EN AW 6063
Product description	Secondary aluminium billets alloy 6063
Product code	80007ALL, 80007ALL203, 80007ALL229, 80007ALL254
Billets Diameter (mm)	178 – 203 – 229 – 254
Lenght (mm)	from 5800 to 6400
Packaging	wood with thermal treatment (drying) and iron stripe

AW 6005

Alloy reference	EN AW 6005
Product description	Secondary aluminium billets alloy 6005
Product code	80004ALL, 80004ALL203, 80004ALL229, 80004ALL254
Billets Diameter (mm)	178 – 203 – 229 – 254
Lenght (mm)	from 5800 to 6400
Packaging	wood with thermal treatment (drying) and iron stripe

AW 6082

Alloy reference	EN AW 6082
Product description	Secondary aluminium billets alloy 6082
Product code	80005ALL, 80005ALL203, 80005ALL229, 80005ALL254
Billets Diameter (mm)	178 – 203 – 229 – 254
Lenght (mm)	from 5800 to 6400
Packaging	wood with thermal treatment (drying) and iron stripe

LIFE CYCLE ASSESSMENT

This Environmental Product Declaration and the Life Cycle Assessment on which it is based describe the environmental profile of four billets of aluminum alloys produced by novALmec S.r.l., according to the from cradle to gate with options scenario. This scenario includes the stages of primary aluminum and ancillary materials production (A1) and transport (A2), the grinding and selection treatment of aluminum scraps (A3), the production of aluminum alloys by casting and the homogenizing heat treatments of the billets (A3); all these processes are directly conducted or controlled by novALmec S.r.l. Downstream of the plant gate, the phase of transport to average customers in the reference market (A4) is also considered, since this activity is partly controlled or otherwise known to the company.

On the contrary, the phases of installation (A5), use and maintenance during the useful life of the product (B) are excluded, since the billets are not used as they are but they constitute a semi-finished product for companies that deal with the production of extruded profiles applied in the construction sector. The end-of-life phases (C) and the analysis of loads and benefits beyond the system boundaries (D) are excluded from the evaluation, according to the paragraph 5.2 of the EN 15804:20219.

Production stage			Construction stage		Use stage							End of life stage				Benefits and loads beyond the syst. boundaries
Raw materials	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Demolition	Transport	Waste processing	Disposal	Reuse Recovery Recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

MND: Module Not Declared.

EPD type: specific for the aluminum alloys under assessment.

Geographical area: Italy, according to production and average sale market conditions.

Reference year: 2022.

Software: SimaPro V. 9.5.

Database: Ecoinvent V. 3.9.

Functional unit: 1 kg of aluminum alloy billet, packed at the gate of the production plant.

Reference Service Life: not applicable since modules from B1 to B7 are not evaluated.

ENVIRONMENTAL PERFORMANCES

AW 6060

	Parameters	Unit	Total A1-A3	A1	A2	A3	A4
Environmental impacts	GWP _{total}	kg CO ₂ eq.	5,76E +00	5,02E +00	2,06E -01	5,31E -01	4,36E -02
	GWP _{fossil}	kg CO ₂ eq.	5,66E +00	4,95E +00	2,04E -01	5,13E -01	4,33E -02
	GWP _{biogenic}	kg CO ₂ eq.	5,31E -02	3,36E -02	1,41E -03	1,80E -02	3,18E -04
	GWP _{luluc}	kg CO ₂ eq.	4,29E -02	4,20E -02	1,05E -04	7,86E -04	2,14E -05
	ODP	kg CFC-11 eq.	6,32E -08	5,59E -08	4,34E -09	2,95E -09	9,44E -10
	AP	mol H ⁺ eq.	4,24E -02	4,00E -02	1,05E -03	1,34E -03	1,30E -04
	EP _{freshwater}	kg P eq.	1,72E -03	1,58E -03	1,38E -05	1,22E -04	3,05E -06
	EP _{marine}	kg N eq.	8,26E -03	6,10E -03	3,08E -04	1,85E -03	4,28E -05
	EP _{terrestrial}	mol N eq.	7,63E -02	6,42E -02	3,30E -03	8,83E -03	4,49E -04
	POCP	kg NMVOC eq.	2,57E -02	1,98E -02	1,21E -03	4,72E -03	1,96E -04
	ADP _{minerals and metals}	kg Sb eq.	4,73E -06	3,71E -06	6,23E -07	3,93E -07	1,40E -07
	ADP _{fossil}	MJ	5,86E +01	5,23E +01	2,87E +00	3,38E +00	6,15E -01
	WDP	m ³ _{deprived} eq.	1,99E +00	1,70E +00	1,14E -02	2,78E -01	2,52E -03

GWP = Global warming potential (total, fossil fuels, biogenic, land use and land use change); ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential; EP = Eutrophication potential (freshwater, marine, terrestrial); POCP = Formation potential of tropospheric ozone; ADP_{minerals and metals} = Abiotic depletion potential for non-fossil resources; ADP_{fossil} = Abiotic depletion potential for fossil resources; WDP = Water user deprivation potential.

The results of the environmental impact indicators of ADP_{minerals and metals}, ADP_{fossil} and WDP shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. The additional environmental impact indicators have been calculated for all the products, but not reported in the EPD.

The biogenic carbon content in the accompanying packaging of this product is: 1,22E-03 kg C

ENVIRONMENTAL PERFORMANCES

AW 6060

	Parameters	Unit	Total A1-A3	A1	A2	A3	A4
Resource use	PERE	MJ	7,03E +00	6,19E +00	5,26E -02	7,91E -01	1,17E -02
	PERM	MJ	4,06E -02	0,00E +00	0,00E +00	4,06E -02	0,00E +00
	PERT	MJ	7,07E +00	6,19E +00	5,26E -02	8,32E -01	1,17E -02
	PENRE	MJ	6,21E +01	5,55E +01	3,05E +00	3,55E +00	6,54E -01
	PENRM	MJ	6,34E -03	0,00E +00	0,00E +00	6,34E -03	0,00E +00
	PENRT	MJ	6,21E +01	5,55E +01	3,05E +00	3,55E +00	6,54E -01
	SM	kg	8,59E -01	8,59E -01	0,00E +00	0,00E +00	0,00E +00
	RSF	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	NRSF	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	FW	m3	5,06E -02	4,21E -02	3,97E -04	8,04E -03	8,80E -05
	<p>PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water.</p>						
Waste and output flows	HWD	kg	1,04E -04	8,00E -05	1,80E -05	6,18E -06	3,91E -06
	NHWD	kg	1,27E +00	9,85E -01	1,32E -01	1,54E -01	3,02E -02
	RWD	kg	3,35E -05	1,15E -05	8,92E -07	2,11E -05	2,01E -07
	CRU	kg	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	MFR	kg	6,35E -01	0,00E +00	0,00E +00	6,35E -01	0,00E +00
	MER	kg	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	EEE	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	EET	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
<p>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; EET = Exported thermal energy.</p>							

ENVIRONMENTAL PERFORMANCES

AW 6063

	Parameters	Unit	Total A1-A3	A1	A2	A3	A4
Environmental impacts	GWP _{total}	kg CO ₂ eq.	5,83E +00	5,09E +00	2,06E -01	5,31E -01	4,36E -02
	GWP _{fossil}	kg CO ₂ eq.	5,73E +00	5,01E +00	2,04E -01	5,13E -01	4,33E -02
	GWP _{biogenic}	kg CO ₂ eq.	5,42E -02	3,48E -02	1,41E -03	1,80E -02	3,18E -04
	GWP _{luluc}	kg CO ₂ eq.	4,30E -02	4,21E -02	1,06E -04	7,86E -04	2,14E -05
	ODP	kg CFC-11 eq.	6,47E -08	5,74E -08	4,35E -09	2,95E -09	9,44E -10
	AP	mol H ⁺ eq.	4,27E -02	4,03E -02	1,06E -03	1,34E -03	1,30E -04
	EP _{freshwater}	kg P eq.	1,74E -03	1,61E -03	1,38E -05	1,22E -04	3,05E -06
	EP _{marine}	kg N eq.	8,32E -03	6,16E -03	3,09E -04	1,85E -03	4,28E -05
	EP _{terrestrial}	mol N eq.	7,70E -02	6,48E -02	3,32E -03	8,83E -03	4,49E -04
	POCP	kg NMVOC eq.	2,60E -02	2,01E -02	1,22E -03	4,72E -03	1,96E -04
	ADP _{minerals and metals}	kg Sb eq.	4,82E -06	3,80E -06	6,24E -07	3,93E -07	1,40E -07
	ADP _{fossil}	MJ	5,94E +01	5,31E +01	2,87E +00	3,38E +00	6,15E -01
	WDP	m ³ _{deprived} eq.	1,99E +00	1,70E +00	1,14E -02	2,78E -01	2,52E -03

GWP = Global warming potential (total, fossil fuels, biogenic, land use and land use change); ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential; EP = Eutrophication potential (freshwater, marine, terrestrial); POCP = Formation potential of tropospheric ozone; ADP_{minerals and metals} = Abiotic depletion potential for non-fossil resources; ADP_{fossil} = Abiotic depletion potential for fossil resources; WDP = Water user deprivation potential.

The results of the environmental impact indicators of ADP_{minerals and metals}, ADP_{fossil} and WDP shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. The additional environmental impact indicators have been calculated for all the products, but not reported in the EPD.

The biogenic carbon content in the accompanying packaging of this product is: 1,22E-03 kg C

ENVIRONMENTAL PERFORMANCES

AW 6063

	Parameters	Unit	Total A1-A3	A1	A2	A3	A4
Resource use	PERE	MJ	7,09E +00	6,24E +00	5,27E -02	7,91E -01	1,17E -02
	PERM	MJ	4,06E -02	0,00E +00	0,00E +00	4,06E -02	0,00E +00
	PERT	MJ	7,13E +00	6,24E +00	5,27E -02	8,32E -01	1,17E -02
	PENRE	MJ	6,29E +01	5,63E +01	3,05E +00	3,55E +00	6,54E -01
	PENRM	MJ	6,34E -03	0,00E +00	0,00E +00	6,34E -03	0,00E +00
	PENRT	MJ	6,29E +01	5,63E +01	3,05E +00	3,55E +00	6,54E -01
	SM	kg	8,59E -01	8,59E -01	0,00E +00	0,00E +00	0,00E +00
	RSF	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	NRSF	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	FW	m3	5,07E -02	4,23E -02	3,98E -04	8,04E -03	8,80E -05
	<p>PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water.</p>						
Waste and output flows	HWD	kg	1,05E -04	8,10E -05	1,80E -05	6,18E -06	3,91E -06
	NHWD	kg	1,28E +00	9,92E -01	1,32E -01	1,54E -01	3,02E -02
	RWD	kg	3,39E -05	1,19E -05	8,93E -07	2,11E -05	2,01E -07
	CRU	kg	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	MFR	kg	6,35E -01	0,00E +00	0,00E +00	6,35E -01	0,00E +00
	MER	kg	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	EEE	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	EET	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
<p>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; EET = Exported thermal energy.</p>							

ENVIRONMENTAL PERFORMANCES

AW 6005

	Parameters	Unit	Total A1-A3	A1	A2	A3	A4
Environmental impacts	GWP _{total}	kg CO ₂ eq.	6,02E +00	5,28E +00	2,08E -01	5,31E -01	4,36E -02
	GWP _{fossil}	kg CO ₂ eq.	5,92E +00	5,20E +00	2,06E -01	5,13E -01	4,33E -02
	GWP _{biogenic}	kg CO ₂ eq.	6,15E -02	4,21E -02	1,42E -03	1,80E -02	3,18E -04
	GWP _{luluc}	kg CO ₂ eq.	4,31E -02	4,22E -02	1,07E -04	7,86E -04	2,14E -05
	ODP	kg CFC-11 eq.	6,70E -08	5,97E -08	4,37E -09	2,95E -09	9,44E -10
	AP	mol H ⁺ eq.	4,38E -02	4,14E -02	1,10E -03	1,34E -03	1,30E -04
	EP _{freshwater}	kg P eq.	1,79E -03	1,66E -03	1,39E -05	1,22E -04	3,05E -06
	EP _{marine}	kg N eq.	8,53E -03	6,36E -03	3,19E -04	1,85E -03	4,28E -05
	EP _{terrestrial}	mol N eq.	7,92E -02	6,69E -02	3,42E -03	8,83E -03	4,49E -04
	POCP	kg NMVOC eq.	2,68E -02	2,08E -02	1,25E -03	4,72E -03	1,96E -04
	ADP _{minerals and metals}	kg Sb eq.	4,97E -06	3,95E -06	6,27E -07	3,93E -07	1,40E -07
	ADP _{fossil}	MJ	6,12E +01	5,49E +01	2,89E +00	3,38E +00	6,15E -01
	WDP	m ³ _{deprived} eq.	2,01E +00	1,72E +00	1,14E -02	2,78E -01	2,52E -03

GWP = Global warming potential (total, fossil fuels, biogenic, land use and land use change); ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential; EP = Eutrophication potential (freshwater, marine, terrestrial); POCP = Formation potential of tropospheric ozone; ADP_{minerals and metals} = Abiotic depletion potential for non-fossil resources; ADP_{fossil} = Abiotic depletion potential for fossil resources; WDP = Water user deprivation potential.

The results of the environmental impact indicators of ADP_{minerals and metals}, ADP_{fossil} and WDP shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. The additional environmental impact indicators have been calculated for all the products, but not reported in the EPD.

The biogenic carbon content in the accompanying packaging of this product is: 1,22E-03 kg C

ENVIRONMENTAL PERFORMANCES

AW 6005

	Parameters	Unit	Total A1-A3	A1	A2	A3	A4
Resource use	PERE	MJ	7,30E +00	6,46E +00	5,29E -02	7,91E -01	1,17E -02
	PERM	MJ	4,06E -02	0,00E +00	0,00E +00	4,06E -02	0,00E +00
	PERT	MJ	7,34E +00	6,46E +00	5,29E -02	8,32E -01	1,17E -02
	PENRE	MJ	6,49E +01	5,83E +01	3,08E +00	3,55E +00	6,54E -01
	PENRM	MJ	6,34E -03	0,00E +00	0,00E +00	6,34E -03	0,00E +00
	PENRT	MJ	6,49E +01	5,83E +01	3,08E +00	3,55E +00	6,54E -01
	SM	kg	8,59E -01	8,59E -01	0,00E +00	0,00E +00	0,00E +00
	RSF	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	NRSF	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	FW	m3	5,12E -02	4,28E -02	4,00E -04	8,04E -03	8,80E -05
	<p>PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water.</p>						
Waste and output flows	HWD	kg	1,08E -04	8,33E -05	1,81E -05	6,18E -06	3,91E -06
	NHWD	kg	1,30E +00	1,02E +00	1,32E -01	1,54E -01	3,02E -02
	RWD	kg	3,51E -05	1,31E -05	8,97E -07	2,11E -05	2,01E -07
	CRU	kg	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	MFR	kg	6,35E -01	0,00E +00	0,00E +00	6,35E -01	0,00E +00
	MER	kg	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	EEE	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	EET	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
<p>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; EET = Exported thermal energy.</p>							

ENVIRONMENTAL PERFORMANCES

AW 6082

	Parameters	Unit	Total A1-A3	A1	A2	A3	A4
Environmental impacts	GWP _{total}	kg CO ₂ eq.	6,11E +00	5,37E +00	2,10E -01	5,31E -01	4,36E -02
	GWP _{fossil}	kg CO ₂ eq.	6,01E +00	5,29E +00	2,08E -01	5,13E -01	4,33E -02
	GWP _{biogenic}	kg CO ₂ eq.	6,00E -02	4,05E -02	1,43E -03	1,80E -02	3,18E -04
	GWP _{luluc}	kg CO ₂ eq.	4,31E -02	4,22E -02	1,08E -04	7,86E -04	2,14E -05
	ODP	kg CFC-11 eq.	7,01E -08	6,27E -08	4,41E -09	2,95E -09	9,44E -10
	AP	mol H ⁺ eq.	4,42E -02	4,17E -02	1,14E -03	1,34E -03	1,30E -04
	EP _{freshwater}	kg P eq.	1,83E -03	1,69E -03	1,40E -05	1,22E -04	3,05E -06
	EP _{marine}	kg N eq.	8,63E -03	6,44E -03	3,30E -04	1,85E -03	4,28E -05
	EP _{terrestrial}	mol N eq.	8,02E -02	6,78E -02	3,55E -03	8,83E -03	4,49E -04
	POCP	kg NMVOC eq.	2,73E -02	2,13E -02	1,28E -03	4,72E -03	1,96E -04
	ADP _{minerals and metals}	kg Sb eq.	5,17E -06	4,15E -06	6,31E -07	3,93E -07	1,40E -07
	ADP _{fossil}	MJ	6,24E +01	5,61E +01	2,92E +00	3,38E +00	6,15E -01
	WDP	m ³ _{deprived} eq.	2,02E +00	1,73E +00	1,15E -02	2,78E -01	2,52E -03

GWP = Global warming potential (total, fossil fuels, biogenic, land use and land use change); ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential; EP = Eutrophication potential (freshwater, marine, terrestrial); POCP = Formation potential of tropospheric ozone; ADP_{minerals and metals} = Abiotic depletion potential for non-fossil resources; ADP_{fossil} = Abiotic depletion potential for fossil resources; WDP = Water user deprivation potential.

The results of the environmental impact indicators of ADP_{minerals and metals}, ADP_{fossil} and WDP shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator. The additional environmental impact indicators have been calculated for all the products, but not reported in the EPD.

The biogenic carbon content in the accompanying packaging of this product is: 1,22E-03 kg C

ENVIRONMENTAL PERFORMANCES

AW 6082

	Parameters	Unit	Total A1-A3	A1	A2	A3	A4
Resource use	PERE	MJ	7,33E +00	6,49E +00	5,33E -02	7,91E -01	1,17E -02
	PERM	MJ	4,06E -02	0,00E +00	0,00E +00	4,06E -02	0,00E +00
	PERT	MJ	7,37E +00	6,49E +00	5,33E -02	8,32E -01	1,17E -02
	PENRE	MJ	6,62E +01	5,95E +01	3,11E +00	3,55E +00	6,54E -01
	PENRM	MJ	6,34E -03	0,00E +00	0,00E +00	6,34E -03	0,00E +00
	PENRT	MJ	6,62E +01	5,95E +01	3,11E +00	3,55E +00	6,54E -01
	SM	kg	8,59E -01	8,59E -01	0,00E +00	0,00E +00	0,00E +00
	RSF	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	NRSF	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	FW	m3	5,14E -02	4,30E -02	4,03E -04	8,04E -03	8,80E -05
	<p>PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water.</p>						
Waste and output flows	HWD	kg	1,09E -04	8,48E -05	1,83E -05	6,18E -06	3,91E -06
	NHWD	kg	1,31E +00	1,02E +00	1,33E -01	1,54E -01	3,02E -02
	RWD	kg	3,56E -05	1,37E -05	9,03E -07	2,11E -05	2,01E -07
	CRU	kg	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	MFR	kg	6,35E -01	0,00E +00	0,00E +00	6,35E -01	0,00E +00
	MER	kg	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	EEE	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
	EET	MJ	0,00E +00	0,00E +00	0,00E +00	0,00E +00	0,00E +00
<p>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; EET = Exported thermal energy.</p>							

CALCULATION RULES

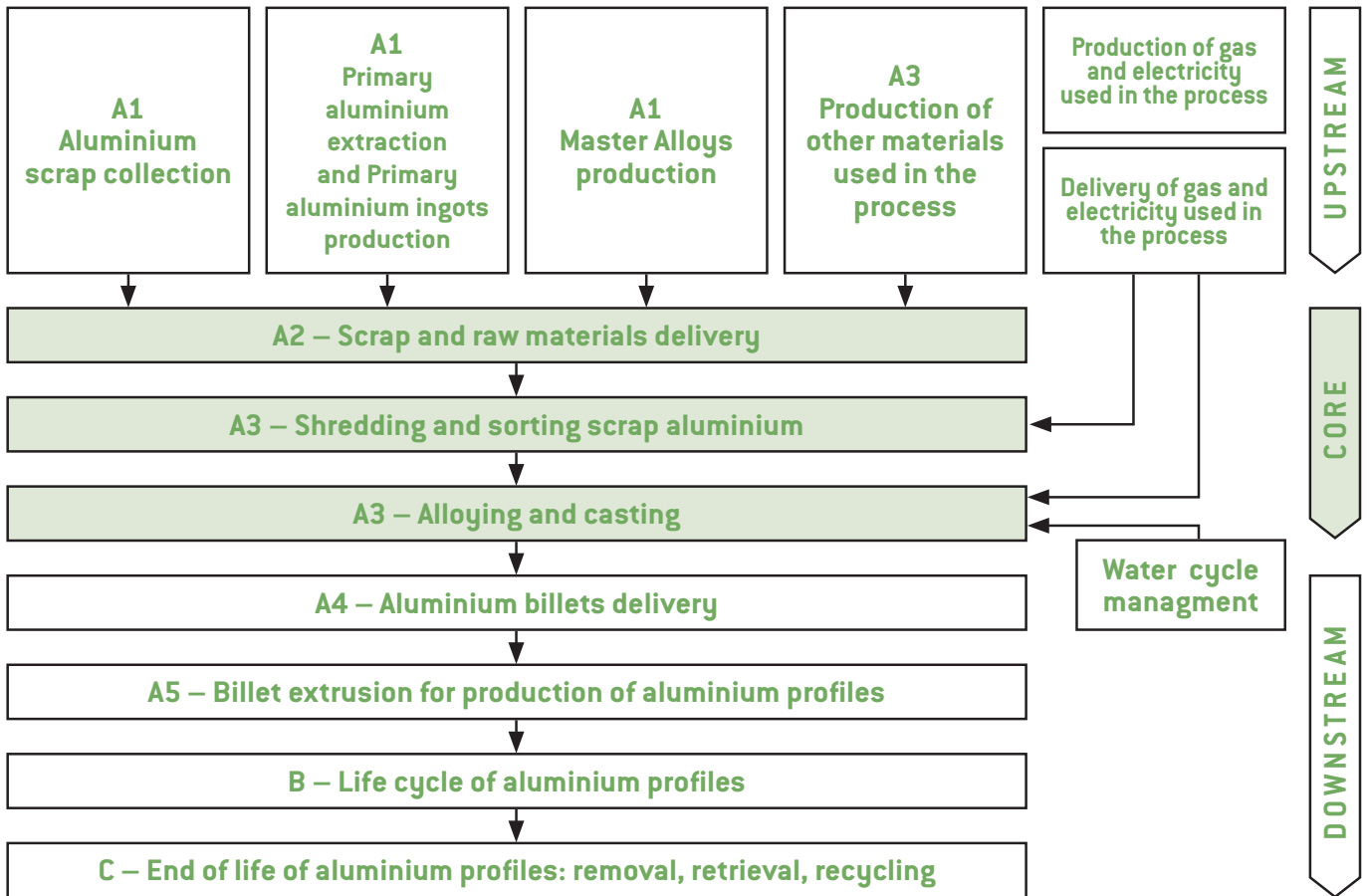
The environmental profiles of the four billets of aluminum alloys produced by novALmec S.r.l. presented in this EPD are based on a Life Cycle Assessment, conducted according to the ISO 14040:2006, ISO 14044:2006, ISO 14025:2010 and EN 15804:2012+A2:2019 standards. The LCA and the EPD are also in compliance with the PCR ICMQ-001/15 V. 3, for construction products, and the Program Guidelines of EPDItaly, Revision 5.2 of 16.02.2022. The environmental analysis covers the production stage of the products, according to the from cradle to gate with options scenario, in which infrastructures, production plants and their maintenance are not considered.

The LCA study is based on primary data collected by novALmec S.r.l. regarding the bill of materials of the four aluminum alloys, the aluminum scraps purchasing, grinding and selection, the production of aluminum alloys by casting and the homogenizing heat treatments of the billets; the transport for the procurement of raw materials and the delivery of the finished product are also included. Ecoinvent V. 3.9 database was adopted to describe the processes for which primary data were not available; the LCA model was built with SimaPro V. 9.5 software in order to obtain the environmental results presented in this EPD.

The production of the different aluminum alloys take place in the same way, therefore significant variation among the energy consumption due to different products production are not conceivable. For this reason, the consumption of electricity, natural gas, diesel for handling and water are allocated by dividing the total amount according to the total production. No cut-off criteria were applied to the production stage and the data quality was verified in accordance with the reference standards and PCR.

SYSTEM BOUNDARIES

The system boundaries of the analyzed process include all the stages from the procurement of aluminum scraps and raw materials to the billets delivery to customers, with the subdivision into Upstream, Core and Downstream process. The Upstream process include the aluminum scraps purchasing, the production of primary aluminum and alloys; the generation and dispatching of the energy carriers such as electricity and natural gas also fall in this stage. The transport of scraps and raw materials to the production plant is included in the Core process, together with the grinding and selection of scraps, the casting process and the thermal treatment of billets, the water and waste management, the on-site emissions. In the Downstream phase, the transport to the average customer of the billets is included; on the contrary, use and end-of-life scenarios are excluded due to the specific characteristics of the product.



ADDITIONAL ENVIRONMENTAL INFORMATION

The content of recycled, recovered, by-product materials in the four billets of aluminum alloys produced by novALmec S.r.l. was calculated according to the ICMQ Regulation for the certification of the content of recycled/recovered material/by-product CPDOC262, Revision 2.2 of 14.08.2023.

Minimum content of recycled, recovered, by-product materials								
Product type	Product name	Recycled material			Recovered material	By-product material		Total content of recycled, recovered, by-product material
		Total	Pre-consumer	Post-consumer		Internal	Esternal	
		%	%	%	%	%	%	
Aluminum alloy billet	AW 6060	68,3	0,4	68,0	0	0	9,3	77,6
	AW 6063	68,2	0,4	67,8	0	0	9,3	77,4
	AW 6005	67,6	0,4	67,3	0	0	9,2	76,8
	AW 6082	66,8	0,4	66,4	0	0	9,1	75,9

REFERENCES

- EN ISO 14040:2006 – Environmental management – Life cycle assessment – Principles and framework;
- EN ISO 14044:2006 – Environmental management – Life cycle assessment – Requirements and guidelines;
- EN ISO 14025:2010 – Environmental labels and declarations – Type III environmental declarations – Principles and procedures;
- EN 15804:2012+A2:2019 – Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products;
- PCR ICMQ-001/15 – Prodotti e servizi per le costruzioni, Version 3 of 02.12.2019, valid until 01.12.2024;
- Program Guidelines of EPDIItaly, Revision 5.2 of 16.02.2022.
- Report di Analisi di Life Cycle Assessment e Environmental Product Declaration di leghe di alluminio in billette, Revision 2 of 12-01-2024.

