aperam

Come leggere le nostre EPD

Come le nostre EPD vi avvantaggiano

Le EPD illustrano l'impatto che i nostri prodotti hanno nel loro ciclo di vita. Aiutano inoltre i nostri clienti a prendere decisioni complete sull'acciaio inossidabile che acquistano.

Aperam è un'azienda leader a livello mondiale nel settore dell'acciaio inossidabile con sostenibilità. Come parte dei nostri sforzi ambientali, utilizziamo le Dichiarazioni Ambientali di Prodotto (EPD) per comunicare l'impatto ambientale dei nostri prodotti durante il loro ciclo di vita dei nostri prodotti, compresa l'impronta di carbonio totale e il consumo di energia lungo tutta la catena produttiva.

Ma le nostre EPD non riguardano solo noi, ma anche i nostri clienti.

Basate su una valutazione del ciclo di vita verificata in modo indipendente e conforme alla norma ISO 14025, queste EPD permettono ai nostri clienti di prendere decisioni informate sull'acciaio inossidabile che acquistano. Inoltre, aiutano i nostri clienti a calcolare l'impatto ambientale del ciclo di vita delle loro applicazioni. Quest'ultimo punto può essere di particolare interesse per il settore dell'edilizia e delle costruzioni, quando si opera nell'ambito di una normativa di bioedilizia.

Indipendentemente dal settore, le nostre EPD aiutano tutti gli utenti finali a diventare più sostenibili. Con le informazioni contenute in questi documenti, i clienti possono assicurarsi che i loro fornitori di acciaio inossidabile siano sia efficienti che sostenibili. Inoltre, possono specificare il Paese di origine del materiale sui loro prodotti e soluzioni.

In altre parole, le nostre EPD vi offrono un vantaggio competitivo unico.

ENVIRONMENTAL PRODUCT DECLARATION

aperam

Cold Rolled Austenitic Stainless Steels – Aperam 304

According to ISO 14025.
EN 15804. and ISO21930:2017

EPD Program and Program Operator Name. Address. Logo, and Website	UL Provided
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	UL Provided
MANUFACTURER NAME AND ADDRESS	**Aperam** 24-26 Boulevard d'Avranches L-1160 Luxembourg LUXEMBOURG
DECLARATION NUMBER	UL Provided
DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT	Cold Rolled Austenitic Stainless Steels - Aperam 304; 1 metric ton
REFERENCE PCR AND VERSION NUMBER	PCR - Part A: Life Cycle Assessment Calculation Rules and Report Requirements. Version 3.2. September 2018. UL Environment. PCR - Part B: Designated Steel Construction - Product EPD Requirements, Version 2.0. August 2021. UL Environment.
DESCRIPTION OF PRODUCT APPLICATION/USE	Stainless steel for building construction use
PRODUCT RSL DESCRIPTION (IF APPL.)	N/A
MARKETS OF APPLICABILITY	North America/Europe/Global
DATE OF ISSUE	UL Provided
PERIOD OF VALIDITY	UL Provided
EPD TYPE	Product-specific
RANGE OF DATASET VARIABILITY	N/A
EPD SCOPE	Cradle to gate with C and D steps in options
YEAR(S) OF REPORTED PRIMARY DATA	2020
LCA SOFTWARE & VERSION NUMBER	SimaPro 9.1
LCI DATABASE(S) & VERSION NUMBER	ecoinvent 3.6
LCIA METHODOLOGY & VERSION NUMBER	TRACI 2.1
The PCR review was conducted by:	UL Provided UL Provided UL Provided
This declaration was independently verified in accordance with ISO 14025: 2006. The UL Environment "Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report," v3.2 (December 2018), in conformance with ISO 21930:2017, serves as the core PCR, with additional considerations from the USGBC/UL Environment Part A Enhancement (2017) ☐ INTERNAL ☒ EXTERNAL	UL Provided

Queste informazioni obbligatorie sono sempre nella prima pagina della dell'EPD. Questo indica che tutte le informazioni contenute in questa EPD si riferiscono a **1 tonnellata metrica di laminato a freddo in AISI 304**

Indica quando la EPD è stata emessa e quando le informazioni in essa contenute diventeranno obsolete o non valide.

Il nome e le informazioni di contatto del fornitore esterno indipendente che ha verificato che le informazioni contenute nella EPD sono conformi alla norma ISO 14025.

Aperam is a global player in stainless, electrical and specialty steel, with customers in over 40 countries. The business is organized in three primary operating segments: Stainless & Electrical Steel, Services & Solutions and Alloys & Specialties.

Aperam has a flat Stainless and Electrical steel capacity of 2.5 million tons in Brazil and Europe and is a leader in high value specialty products. In addition to its industrial network, spread over six production facilities in Brazil, Belgium, and France, Aperam has a highly integrated distribution, processing and services network and a unique capability to produce stainless and special steels from low-cost biomass (charcoal made from its own FSC-certified forestry).

In 2020, Aperam achieved sales of 3.6 billion euros and shipped 1.68 million tons of steel.

1.2. Product Description

1.2.1. Product Identification

This EPD is related to the products manufactured in the Belgian and French factories.

Our 304 grades of stainless steel are a general-purpose grade offering:
> Excellent resistance to pitting and crevice corrosion
> Good ductility
> Can easily be welded and polished
> 304L and 304M have a very good resistance to intergranular corrosion
> 304D, 304ED and 304M have very good drawability

Table 1: Declared products identification

Grade designation	European designation	American designation	Finishing (according to EN 10088)					
			2B	2D	2E	2H	2J	2M
304	X5CrNi18-10 / 1.4301[(1)]	UNS 30400 / Type 304[(2)]	✓	✓	✓	✓	✓	✓
304D	X5CrNi18-10 / 1.4301[(1)]	UNS 30400 / Type 304[(2)]	✓	✓		✓		
304ED	X5CrNi18-10 / 1.4301[(1)]	UNS 30400 / Type 304[(2)]	✓	✓				
304H	X6CrNi18-10 / 1.4948[(1)]	UNS 30409 / Type 304[(2)]	✓	✓				
304L	X2CrNi18-9 / 1.4307[(1)]	UNS 30403 / Type 304L[(2)]	✓	✓	✓	✓		
304M	X2CrNi19-11 / 1.4306[(1)]	UNS 30403 / Type 304L[(2)]	✓	✓				
304LN	X2CrNiN18–10 / 1.4311[(1)] X5CrNiN19–9 / 1.4315[(1)]	UNS 30453 / Type 304LN[(2)] UNS 30451 / Type 304N[(2)]	✓		✓			

[(1)]According to EN 100088-2; [(2)]According to ASTM A240
2B: Cold-rolled, annealed, pickled and skin passed; **2D**: Cold-rolled, annealed and pickled, not skinpassed, and Uginox Access; **2E**: Cold-rolled, rough, matt; **2H**: Work hardened; **2J**: Uginox Rolled-On, and Scotch-Brite; **2M**: Uginox Linen, Uginox Squares, Uginox Lozenge, and Uginox Leather.

Questo è un elenco dettagliato dei prodotti (grades + finiture) coperti dall'EPD.

TABLE 7: DESCRIPTION OF THE SYSTEM BOUNDARY MODULES

	PRODUCT STAGE			CONSTRUCT-ION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
	Raw material supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Building Operational Energy Use During Product Use	Building Operational Water Use During Product Use	Deconstruction	Transport	Waste processing	Disposal	Reuse. Recovery. Recycling Potential
Declared modules	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

MND: Modules Not Declared.

I moduli

A monte

Aperam

Poiché questo varia a seconda dell'uso, tali informazioni non sono incluse nella EPD.

I processi che seguono dopo l'utilizzo di un prodotto, compreso il recupero degli scarti fino alla fusione.

Il potenziale di risparmio se i rottami vengono riutilizzati.

4.1. Life Cycle Impact Assessment Results

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 8: North American Life Cycle Impact Assessment Results

Impact category	A1	A2	A3	C1	C2	C3	C4	D
GWP 100 [kg CO_2 eq]	1.24E+03	4.73E+01	7.37E+02	3.62E+00	1.35E+01	3.17E+01	2.57E-01	-8.90E+02
ODP [kg CFC-11 eq]	7.78E-05	9.62E-06	1.57E-04	8.35E-07	3.39E-06	1.84E-06	1.15E-07	-7.19E-05
AP [kg SO_2 eq]	1.73E+01	6.07E-01	2.18E+00	3.51E-02	4.99E-02	1.39E-01	2.22E-03	-3.89E+00
EP [kg N eq]	7.80E-01	4.04E-02	3.26E-01	3.09E-02	6.99E-03	1.71E-02	2.65E-04	-6.23E-01
SFP [kg O_3 eq]	8.31E+01	1.27E+01	4.80E+01	1.08E+00	1.09E+00	1.73E+00	5.47E-02	-5.16E+01
ADP_{fossil} [MJ, LHV]	8.46E+02	8.59E+01	1.22E+03	7.46E+00	3.04E+01	2.30E+01	1.07E+00	-5.46E+02

These six impact categories are globally deemed mature enough to be included in Type III environmental declarations. Other categories are being [illegible] and defined and LCA should continue making advances in their development. However, the EPD users shall not use additional measures for comparative purpos[illegible]

Table 9: EU Life Cycle Impact Assessment Results

Impact category	A1	A2	A3	C1	C2	C3	C4	D
GWP 100 [kg CO_2 eq]	1.24E+03	4.73E+01	7.37E+02	3.62E+00	1.35E+01	3.17E+01	2.57E-01	-8.89E+02
ODP [kg CFC-11 eq]	6.16E-05	7.27E-06	1.38E-04	6.28E-07	2.55E-06	1.42E-06	8.61E-08	-6.38E-05
AP [kg SO_2 eq]	1.93E+01	5.51E-01	1.90E+00	2.73E-02	4.44E-02	1.36E-01	1.89E-03	-3.82E+00
EP [kg $(PO_4)^{-3}$ eq]	7.36E-01	7.33E-02	3.50E-01	5.98E-03	7.28E-03	1.55E-02	3.33E-04	-5.09E-01
POCP [kg ethane eq]	1.23E+00	4.73E-02	2.53E-01	4.30E-03	8.37E-03	8.89E-03	2.98E-04	-1.34E+00
$ADP_{elements}$ [kg Sb-eq]	4.61E-02	3.04E-04	6.15E-03	5.67E-06	2.33E-04	5.63E-05	2.41E-06	-2.52E-03
$ADP_{fossil\ fuels}$ [MJ, LHV]	1.42E+04	6.22E+02	8.24E+03	5.01E+01	2.08E+02	3.47E+02	7.28E+00	-1.11E+04

Table 10: Rest of World Life Cycle Impact Assessment Results

Impact category	A1	A2	A3	C1	C2	C3	C4	D
GWP 100 [kg CO_2 eq]	1.24E+03	4.73E+01	7.37E+02	3.62E+00	1.35E+01	3.17E+01	2.57E-01	-8.89E+02
ODP [kg CFC-11 eq]	6.16E-05	7.27E-06	1.38E-04	6.28E-07	2.55E-06	1.42E-06	8.61E-08	-6.38E-05
EP [kg $(PO_4)^{-3}$ eq]	7.36E-01	7.33E-02	3.50E-01	5.98E-03	7.28E-03	1.55E-02	3.33E-04	-5.09E-01
AP [kg SO_2 eq]	1.93E+01	5.51E-01	1.90E+00	2.73E-02	4.44E-02	1.36E-01	1.89E-03	-3.82E+00
POCP [kg ethane eq]	1.23E+00	4.73E-02	2.53E-01	4.30E-03	8.37E-03	8.89E-03	2.98E-04	-1.34E+00

Comparability: Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted.

Poiché le diverse regioni hanno regole diverse per effettuare i calcoli necessari, Aperam ha adattato le nostre tabelle per soddisfare tutti i nostri clienti globali.

4.1. Life Cycle Impact Assessment Results

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 8: North American Life Cycle Impact Assessment Results

Impact category	A1	A2	A3	C1	C2	C3	C4	D
GWP 100 [kg CO_2 eq]	1.24E+03	4.73E+01	7.37E+02	3.62E+00	1.35E+01	3.17E+01	2.57E-01	-8.90E+02
ODP [kg CFC-11 eq]	7.78E-05	9.62E-06	1.57E-04	8.35E-07	3.39E-06	1.84E-06	1.15E-07	-7.19E-05
AP [kg SO_2 eq]	1.73E+01	6.07E-01	2.18E+00	3.51E-02	4.99E-02	1.39E-01	2.22E-03	-3.89E+00
EP [kg N eq]	7.80E-01	4.04E-02	3.26E-01	3.09E-03	6.99E-03	1.71E-02	2.65E-04	-6.23E-01
SFP [kg O_3 eq]	8.31E+01	4.27E+01	4.80E+01	1.08E+00	1.09E+00	1.73E+00	5.47E-02	-5.16E+01
ADP_{fossil} [MJ, LHV]	8.46E+02	8.59E+0	1.22E+03	7.46E+00	3.04E+01	2.30E+01	1.07E+00	-5.46E+02

These six impact categories are globally deemed mature enough to be included in T
defined and LCA should continue making advances in their development. However, the

GWP 100: Potenziale di riscaldamento globale, **ODP**: Potenziale di riduzione dell'ozono, AP: Potenziale di acidificazione, EP: Potenziale di eutrofizzazione, **SFP**: Potenziale di formazione di smog, **ADP_{fossil}**: Potenziale di esaurimento delle risorse abiotiche delle risorse energetiche non rinnovabili (fossili).

Table 9: EU Life Cycle Impact Assessment Results

Impact category	A1	A2	A3	C1	C2	C3	C4	D
GWP 100 [kg CO_2 eq]	1.24E+03	4.73E+01	7.37E+02	3.62E+00	1.35E+01	3.17E+01	2.57E-01	-8.89E+02
ODP [kg CFC-11 eq]	6.16E-05	7.27E-06	1.38E-04	6.28E-07	2.55E-06	1.42E-06	8.61E-08	-6.38E-05
AP [kg SO_2 eq]	1.93E+01	5.51E-01	1.90E+00	2.73E-02	4.44E-02	1.36E-01	1.89E-03	-3.82E+00
EP [kg $(PO_4)^{-3}$ eq]	7.36E-01	7.33E-02	3.50E-01	5.98E-03	7.28E-03	1.55E-02	3.33E-04	-5.09E-01
POCP [kg ethane eq]	1.23E+00	4.73E-02	2.53E-01	4.30E-03	8.37E-03	8.89E-03	2.98E-04	-1.34E+00
$ADP_{elements}$ [kg Sb-eq]	4.61E-02	3.04E-04	6.15E-03	5.67E-06	2.33E-04	5.63E-05	2.41E-06	-2.52E-03
$ADP_{fossil\ fuels}$ [MJ, LHV]	1.42E+04	6.22E+0	8.24E+03	5.01E+01	2.08E+02	3.47E+02	7.28E+00	-1.11E+04

GWP 100: Potenziale di riscaldamento globale, **ODP**: Potenziale di esaurimento dello strato di ozono stratosferico, **AP**: Potenziale di acidificazione del suolo e dell'acqua, **EP**: Potenziale di eutrofizzazione, **POCP**: Potenziale di creazione di ossidanti fotochimici, **$ADP_{elements}$**: Potenziale di esaurimento abiotico (ADP-elementi) per le risorse non fossili, **$ADP_{fossil\ fuels}$**: Potenziale di esaurimento abiotico (ADP-combustibili fossili) per le risorse fossili.

Table 10: Rest of World Life Cycle Impact Assessment Results

Impact category	A1	A2	A3	C1	C2	C3	C4	D
GWP 100 [kg CO_2 eq]	1.24E+03	4.73E+01	7.37E+02					
ODP [kg CFC-11 eq]	6.16E-05	7.27E-06	1.38E-04					
EP [kg $(PO_4)^{-3}$ eq]	7.36E-01	7.33E-02	3.50E-01	5.98E-03	7.28E-03	1.55E-02	3.33E-04	-5.09E-01
AP [kg SO_2 eq]	1.93E+01	5.51E-01	1.90E+00	2.73E-02	4.44E-02	1.36E-01	1.89E-03	-3.82E+00
POCP [kg ethane eq]	1.23E+00	4.73E-02	2.53E-01	4.30E-03	8.37E-03	8.89E-03	2.98E-04	-1.34E+00

Comparability: Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted.

Any comparison of EPDs shall be subject to the requirements of ISO 21930. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparison can be inaccurate and could lead to erroneous selection of materials or products which are higher impact, at least in some impact categories.

4.2. LIFE CYCLE INVENTORY RESULTS

TABLE 11: LIFE CYCLE INVENTORY RESULTS: RESOURCE USE

Parameter	A1	A2	A3	C1	C2	C3	C4	D
RPR_E [MJ]	2.45E+03	1.71E+01	1.12E+03	2.73E-01	2.67E+00	4.65E+01	5.95E-02	-6.18E+02
RPR_M [MJ]	0.00E+00	0.00E+00	5.86E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
$NRPR_E$ [MJ]	1.60E+04	6.53E+02	1.60E+04	5.04E+01	2.12E+02	4.21E+02	7.36E+00	-1.25E+04
$NRPR_M$ [MJ]	0.00E+00	0.00E+00	6.07E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SM [kg]	8.83E+02	0.00E+00	0.00E+00	0.00E+00				
RSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
NRSF [MJ]	0.00E+00	0.00E+00	1.37E+01	0.00E+00				
RE [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
FW [m^3]	7.29E+00	1.29E-01	6.17E+00	2.19E-03				

RPR_E: Risorse primarie rinnovabili utilizzate come vettore energetico (combustibile),, RPR_M: Risorse primarie rinnovabili con contenuto energetico utilizzato come materiale, $NRPR_E$: Risorse primarie non rinnovabili utilizzate come vettore energetico (combustibile), $NRPR_M$: Risorse primarie non rinnovabili con contenuto energetico utilizzate come materiale, **SM**: Materiali secondari, **RSF**: Combustibili secondari rinnovabili, **NRSF**: Combustibili secondari non rinnovabili, **RE**: Energia recuperata, **FW**: Utilizzo delle risorse nette di acque dolci.

TABLE 12: LIFE CYCLE INVENTORY RESULTS: OUTPUT FLOWS AND WASTE CATEGORIES

Parameter	A1	A2	A3	C1	C2	C3	C4	D
HWD [kg]	8.15E+02	7.45E-01	2.51E+02	3.18E-02	1.31E-01	1.36E+00	4.34E-03	-4.13E+01
NHWD [kg]	9.30E+02	1.39E+01	1.19E+02	1.96E-01	1.94E+01	2.04E+01	5.00E+01	-8.37E+02
HLRW [kg]	7.19E-03	1.14E-04	2.29E-02	1.32E-06	1.48E-05	3.06E-04	2.83E-07	-4.62E-03
ILLRW [kg]	3.36E-02	4.16E-03	9.28E-02	3.49E-04	1.43E-03	1.02E-03	4.81E-05	-2.46E-02
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR [kg]	1.58E+01	0.00E+00	2.95E+02	0.00E+00	0.00E+00	1.00E+03	0.00E+00	0.00E+00
MER [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00				
EE [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00					

HWD: Rifiuti pericolosi smaltiti, **NHWD**: Rifiuti non pericolosi smaltiti, **HLRW**: Rifiuti radioattivi ad alta attività, condizionati, fino al deposito finale, **ILLRW**: Rifiuti radioattivi a media e bassa attività, condizionati, fino al deposito finale, **CRU**: Componenti per il riutilizzo, **MR**: Materiali per il riciclaggio, **MER**: Materiali per il recupero di energia, **EE**: Energia recuperata esportata dal sistema prodotto.

Abbreviations used in the results tables:

GWP 100: Global Warming Potential, **ODP**: Ozone Depletion Potential, **AP**: Acidification
ADP_{fossil}: Abiotic Resource Depletion Potential of Non-renewable (fossil) energy resourc

GWP 100: Global Warming Potential, **ODP**: Depletion potential of the stratospheric ozone layer, **AP**: Acidification Potential of soil and water, **EP**: Eutrophication

4.1. Life Cycle Impact Assessment Results

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 8: North American Life Cycle Impact Assessment Results

Impact category	A1	A2	A3	C1	C2	C3	C4	D
GWP 100 [kg CO_2 eq]	1.24E+03	4.73E+01	7.37E+02	3.62E+00	1.35E+01	3.17E+01	2.57E-01	-8.90E+02
ODP [kg CFC-11 eq]	7.78E-05	9.62E-06	1.57E-04	8.35E-07	3.39E-06	1.84E-06	1.15E-07	-7.19E-05
AP [kg SO_2 eq]	1.73E+01	6.07E-01	2.18E+00	3.51E-02	4.99E-02	1.39E-01	2.22E-03	-3.89E+00
EP [kg N eq]	7.80E-01	4.04E-02	3.26E-01	3.09E-03	6.99E-03	1.71E-02	2.65E-04	-6.23E-01
SFP [kg O_3 eq]	8.31E+01	1.27E+01	4.80E+01	1.08E+00	1.09E+00	1.73E+00	5.47E-02	-5.16E+01
ADP_{fossil} [MJ, LHV]	8.46E+02	8.59E+01	1.22E+03	7.46E+00	3.04E+01	2.30E+01	1.07E+00	-5.46E+02

L'ambito Cradle-to-Gate corrisponde alla somma dei moduli A1+A2+A3.
I moduli da C1 a D sono opzionali e possono essere presi in considerazione a seconda del tipo di dati disponibili.

These six impact categories are globally deemed mature enough to be included in Type III environmental declarations. Other categories are being developed and defined and LCA should continue making advances in their development. However, the EPD users shall not use additional measures for comparative purposes.

Table 9: EU Life Cycle Impact Assessment Results

Impact category	A1	A2	A3	C1	C2	C3	C4	D
GWP 100 [kg CO_2 eq]	1.24E+03	4.73E+01	7.37E+02	3.62E+00	1.35E+01	3.17E+01	2.57E-01	-8.89E+02
ODP [kg CFC-11 eq]	6.16E-05	7.27E-06	1.38E-04	6.28E-07	2.55E-06	1.42E-06	8.61E-08	-6.38E-05
AP [kg SO_2 eq]	1.93E+01	5.51E-01	1.90E+00	2.73E-02	4.44E-02	1.36E-01	1.89E-03	-3.82E+00
EP [kg $(PO_4)^{-3}$ eq]	7.36E-01	7.33E-02	3.50E-01	5.98E-03	7.28E-03	1.55E-02	3.33E-04	-5.09E-01
POCP [kg ethane eq]	1.23E+00	4.73E-02	2.53E-01	4.30E-03	8.37E-03	8.89E-03	2.98E-04	-1.34E+00
$ADP_{elements}$ [kg Sb-eq]	4.61E-02	3.04E-04	6.15E-03	5.67E-06	2.33E-04	5.63E-05	2.41E-06	-2.52E-03
$ADP_{fossil\ fuels}$ [MJ, LHV]	1.42E+04	6.22E+02	8.24E+03	5.01E+01	2.08E+02	3.47E+02	7.28E+00	-1.11E+04

Table 10: Rest of World Life Cycle Impact Assessment Results

Impact category	A1	A2	A3	C1	C2	C3	C4	D
GWP 100 [kg CO_2 eq]	1.24E+03	4.73E+01	7.37E+02	3.62E+00	1.35E+01	3.17E+01	2.57E-01	-8.89E+02
ODP [kg CFC-11 eq]	6.16E-05	7.27E-06	1.38E-04	6.28E-07	2.55E-06	1.42E-06	8.61E-08	-6.38E-05
EP [kg $(PO_4)^{-3}$ eq]	7.36E-01	7.33E-02	3.50E-01	5.98E-03	7.28E-03	1.55E-02	3.33E-04	-5.09E-01
AP [kg SO_2 eq]	1.93E+01	5.51E-01	1.90E+00	2.73E-02	4.44E-02	1.36E-01	1.89E-03	-3.82E+00
POCP [kg ethane eq]	1.23E+00	4.73E-02	2.53E-01	4.30E-03	8.37E-03	8.89E-03	2.98E-04	-1.34E+00

Quando un valore è negativo, significa che non viene emessa CO_2.

Comparability: Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted.

4.1. Life Cycle Impact Assessment Results

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Table 8: North American Life Cycle Impact Assessment Results

Impact category	A1	A2	A3	C1	C2	C3	C4	D
GWP 100 [kg CO_2 eq]	1.24E+03	4.73E+01	7.37E+02	3.62E+00	1.35E+01	3.17E+01	2.57E-01	-8.90E+02
ODP [kg CFC-11 eq]	7.78E-05	9.62E-06	1.57E-04	8.35E-07	3.39E-06	1.84E-06	1.15E-07	-7.19E-05
AP [kg SO_2 eq]	1.73E+01	6.07E-01	2.18E+00	3.51E-02	4.99E-02	1.39E-01	2.22E-03	-3.89E+00
EP [kg N eq]	7.80E-01	4.04E-02	3.26E-01	3.09E-03	6.99E-03	1.71E-02	2.65E-04	-6.23E-01
SFP [kg O_3 eq]	8.31E+01	1.27E+01	4.80E+01	1.08E+00	1.09E+00	1.73E+00	5.47E-02	-5.16E+01
ADP_{fossil} [MJ, LHV]	8.46E+02	8.59E+01	1.22E+03	7.46E+00	3.04E+01	2.30E+01	1.07E+00	-5.46E+02

These six impact categories are globally deemed mature enough to be included in Type III environmental declarations. Other categories are being developed and defined and LCA should continue making advances in their development. However, the EPD users shall not use additional measures for comparative purposes.

Table 9: EU Life Cycle Impact Assessment Results

Impact category	A1	A2	A3	C1	C2	C3	C4	D
GWP 100 [kg CO_2 eq]	1.24E+03	4.73E+01	7.37E+02	3.62E+00	1.35E+01	3.17E+01	2.57E-01	-8.90E+02
ODP [kg CFC-11 eq]	6.16E-05	7.27E-06	1.38E-04	6.28E-07	2.55E-06	1.42E-06	8.61E-08	-6.38E-05
AP [kg SO_2 eq]	1.93E+01	5.51E-01	1.90E+00	2.73E-02	4.44E-02	1.36E-01	1.89E-03	-3.82E+00
EP [kg $(PO_4)^{-3}$ eq]	7.36E-01	7.33E-02	3.50E-01	5.98E-03	7.28E-03	1.55E-02	3.33E-04	-5.09E-01
POCP [kg ethane eq]	1.23E+00	4.73E-02	2.53E-01	4.30E-03	8.37E-03	8.89E-03	2.98E-04	-1.34E+00
$ADP_{elements}$ [kg Sb-eq]	4.61E-02	3.04E-04	6.15E-03	5.67E-06	2.33E-04	5.63E-05	2.41E-06	-1.34E-02
$ADP_{fossil\ fuels}$ [MJ, LHV]	1.42E+04	6.22E+02	8.24E+03	5.01E+01	2.08E+02	3.47E+02	7.28E+01	-1.34E+04

Table 10: Rest of World Life Cycle Impact Assessment Results

Impact category	A1	A2	A3	C1	C2	C3	C4	D
GWP 100 [kg CO_2 eq]	1.24E+03	4.73E+01	7.37E+02	3.62E+00	1.35E+01	3.17E+01	2.57E-01	-8.89E+02
ODP [kg CFC-11 eq]	6.16E-05	7.27E-06	1.38E-04	6.28E-07	2.55E-06	1.42E-06	8.61E-08	-6.38E-05
EP [kg $(PO_4)^{-3}$ eq]	7.36E-01	7.33E-02	3.50E-01	5.98E-03	7.28E-03	1.55E-02	3.33E-04	-5.09E-01
AP [kg SO_2 eq]	1.93E+01	5.51E-01	1.90E+00	2.73E-02	4.44E-02	1.36E-01	1.89E-03	-3.82E+00
POCP [kg ethane eq]	1.23E+00	4.73E-02	2.53E-01	4.30E-03	8.37E-03	8.89E-03	2.98E-04	-1.34E+00

Ad esempio, se si cerca l'equivalente di CO_2 emesso per il nostro 304 laminato a freddo in un ambito Cradle-to-Gate dal punto di vista di uno stakeholder europeo, si dovrebbe considerare la somma dei moduli A1+A2+A3.

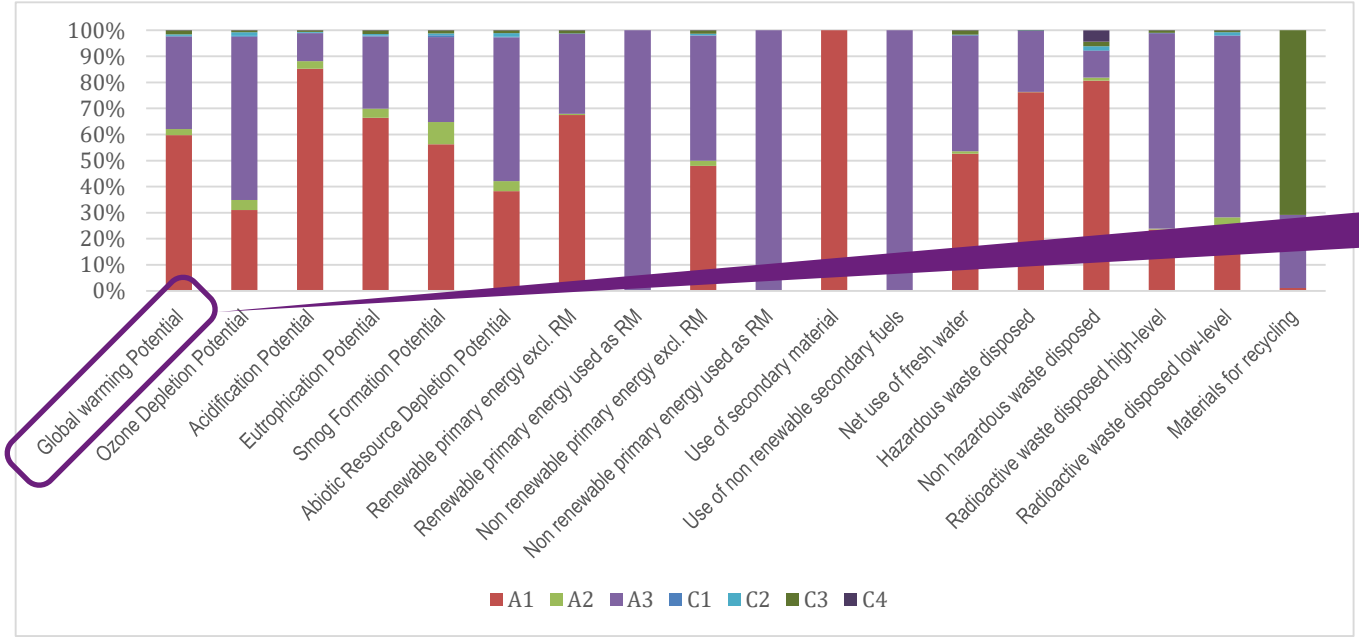
1,24E+03 => 1,24x103

1240+47,3+737 = 2024,3 kg CO_2 eq. per 1 tonnellata di 304 laminato a freddo.

Comparability: Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted.

5. LCA Interpretation

The following graph shows for the non-zero indicators the distribution between the contributions of the different stages of the life cycle:



Questa tabella ci permette di vedere rapidamente che il 60% del potenziale di riscaldamento globale del prodotto è dovuto al modulo A1, ovvero alla parte del ciclo di vita del prodotto che riguarda l'approvvigionamento delle materie prime.

Figure 1: Distribution between the contributions of the different stages of the life cycle for non-zero indicators

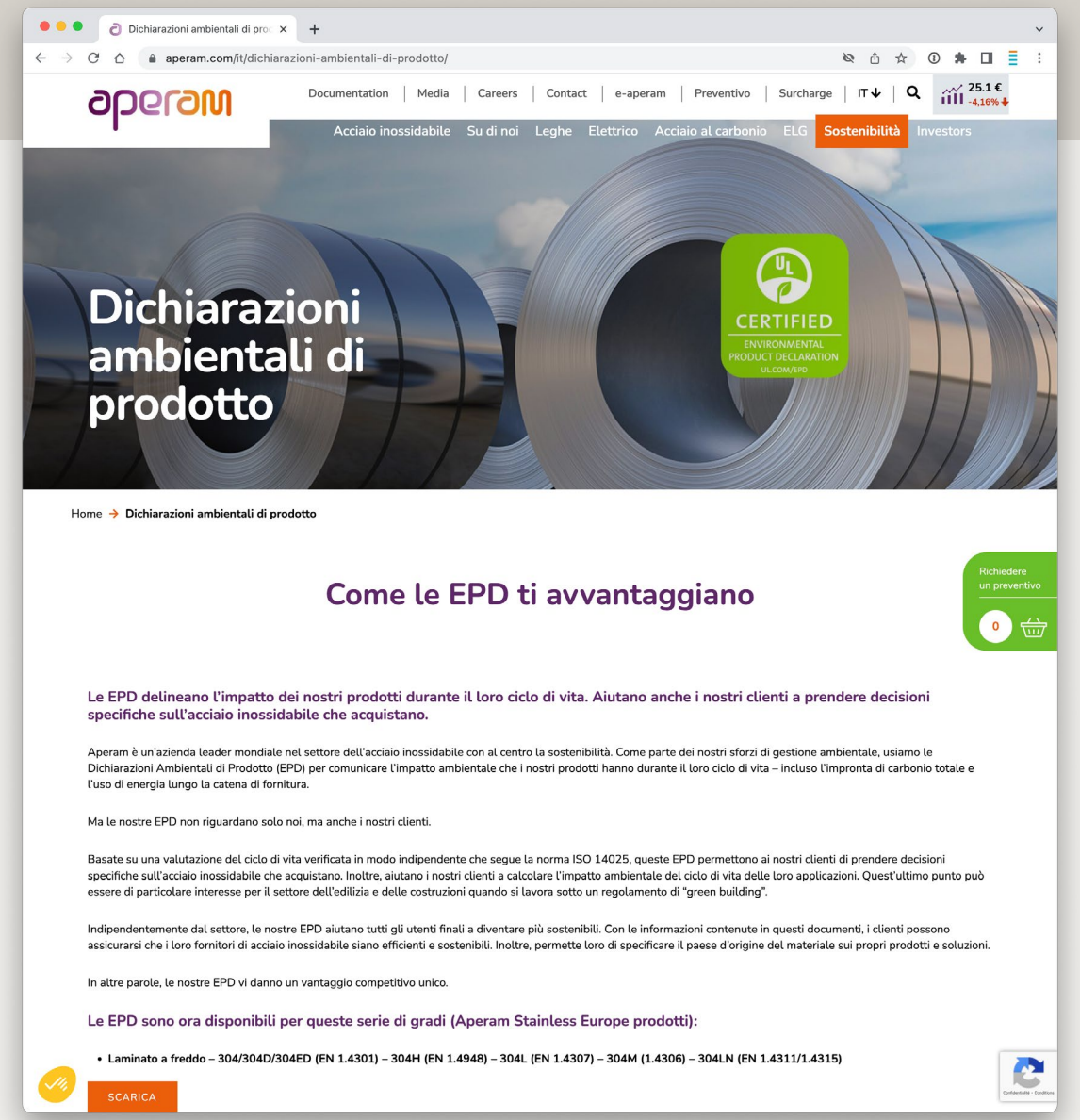
Interpretation:

- The main contributor to environmental impacts is the manufacture of raw materials (A1), especially specific filler metals such as chromium or nickel.
- The significant energy consumption for melting scrap and filler metals and shaping steel coils is the second largest contributor (A3).
- The transport of raw materials is a minority contributor, although a significant portion of the materials come from all over the world.
- The indicative end-of-life scenario for this cradle-to-gate EPD highlights the low environmental impacts of preparing steel for recycling and the substantial gains outside the system boundaries (D).

The following table presents the weighted coefficient of variation of the LCIA results for all products included in the weighted average declaration:

TABLE 13: NORTH AMERICAN LIFE CYCLE IMPACT ASSESSMENT RESULTS: WEIGHTED COEFFICIENTS OF VARIATION

Impact category	Weighted coefficient of variation
GWP 100 [kg CO_2 eq]	2.90%
ODP [kg CFC-11 eq]	7.35%
AP [kg SO_2 eq]	0.89%
EP [kg N eq]	4.27%
SFP [kg O_3 eq]	3.66%
ADP_{fossil} [MJ, LHV]	6.23%



304 series - Cold Rolled

K30 series - Cold Rolled

Tutte le nostre EPD sono disponibili sul nostro sito web:

https://www.aperam.com/it/dichiarazioni-ambientali-di-prodotto/

K41 series - Cold Rolled

304 series - Hot Rolled

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