

ENVIRONMENTAL PRODUCT DECLARATION

COLD ROLLED AUSTENITIC STAINLESS STEELS - APERAM 304



Aperam is a world-leading stainless-steel company with sustainability at its heart. As part of our environmental stewardship efforts, we use Environmental Product Declarations (EPD) to communicate about the environmental impact our products have across their lifecycle – including total carbon footprint and energy use throughout the supply chain.

Based on an independently verified lifecycle assessment that follows ISO 14047, these EPDs allow our customers to make informed decisions about the stainless steel they purchase. It also allows them to calculate the environmental impact of their own application's lifecycle. This last point can be of particular interest to the building and construction industry when working under a 'green building' regulation.

The EPD, together with Aperam being the first stainless steel company to be certified by ResponsibleSteel™, the industry's first global multi-stakeholder standard and certification program, further demonstrates our strong commitment to sustainability.



How to read our EPDs



How Our EPDs Benefit You



EPDs outline the impact our products have across their lifecycle. They also help our customers make informed decisions about the stainless steel they purchase.

Aperam is a world-leading stainless-steel company with sustainability at its heart. As part of our environmental stewardship efforts, we use Environmental Product Declarations (EPD) to communicate about the environmental impact our products have across their lifecycle – including total carbon footprint and energy use throughout the supply chain.

But our EPDs are about more than just us – they also benefit our customers.

Based on an independently verified lifecycle assessment that follows ISO 14025, these EPDs allow our customers to make informed decisions about the stainless steel they purchase. Furthermore, they help our customers calculate the environmental impact of their own application’s lifecycle. This last point can be of particular interest to the building and construction sector when working under a ‘green building’ regulation.

Regardless of sector, our EPDs help all end users become more sustainable. With the information contained in these documents, customers can ensure that their stainless steel suppliers are both efficient and sustainable. It also allows them to specify the material’s country of origin on their own products and solutions.

In other words, our EPDs give you a unique competitive advantage.



ENVIRONMENTAL PRODUCT DECLARATION



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)	UL Provided
<input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL	

This mandatory information is always found on the 1st page of the EPD.

This tells you that all the information contained in this EPD is for **1 metric ton of Cold Rolled 304**.

This tells you when the EPD was issued and when the information it contains will become obsolete, or invalid.

The name and contact information of the independent, external provider who verified that the information contained in the EPD is in accordance with 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⁾	✓		✓			

This is a detailed list of the products (grades + finishing) covered by the EPD.

⁽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.



4. ENVIRONMENTAL INDICATORS DERIVED FROM LCA

TABLE 7: DESCRIPTION OF THE SYSTEM BOUNDARY MODULES

	PRODUCT STAGE			CONSTRUCTION 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

Upstream

Aperam

Because this varies depending on the use, such information is not included in the EPD.

The processes that follow after a product is done being used, including the recovery of scrap all the way to the melt shop.

The potential for savings if scrap is reused.

The modules



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-01	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	2.56E+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	-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

Because different regions have different rules for making the necessary calculations, Aperam has adapted our tables to cater to all our global customers.

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 LCA, defined and LCA should continue making advances in their development. However, the

GWP 100: Global Warming Potential, **ODP**: Ozone Depletion Potential, **AP**: Acidification Potential, **EP**: Eutrophication Potential, **SFP**: Smog Formation Potential, **ADP_{fossil}**: Abiotic Resource Depletion Potential of Non-renewable (fossil) energy resources.

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	-8.90E+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
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

GWP 100: Global Warming Potential, **ODP**: Depletion potential of the stratospheric ozone layer, **AP**: Acidification Potential of soil and water, **EP**: Eutrophication Potential, **POCP**: Photochemical Oxidant Creation Potential, **ADP_{elements}**: Abiotic depletion potential (ADP-elements) for non-fossil resources, **ADP_{fossil fuels}**: Abiotic depletion potential (ADP-fossil fuels) for fossil resources.

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.



ENVIRONMENTAL PRODUCT DECLARATION



Cold Rolled Austenitic Stainless Steels – Aperam 304

According to ISO 14025.
EN 15804 and ISO 21930:2017

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	0.00E+00	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	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ]	0.00E+00	0.00E+00	1.37E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	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-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00

RPR_E: Renewable primary resources used as energy carrier (fuel), RPR_M: Renewable primary resources with energy content used as material, NRPR_E: Non-renewable primary resources used as an energy carrier (fuel), NRPR_M: Non-renewable primary resources with energy content used as material, SM: Secondary materials, RSF: Renewable secondary fuels, NRSF: Non-renewable secondary fuels, RE: Recovered energy, FW: Use of net fresh water resources.

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]	3.30E-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	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, HLRW: High-level radioactive waste, conditioned, to final repository, ILLRW: Intermediate- and low-level radioactive waste, conditioned, to final repository, CRU: Components for re-use, MR: Materials for recycling, MER: Materials for energy recovery, EE: Recovered energy exported from the product system.

Abbreviations used in the results tables:

GWP₁₀₀: Global Warming Potential, ODP: Ozone Depletion Potential, AP: Acidification Potential, ADP_{fossil}: Abiotic Resource Depletion Potential of Non-renewable (fossil) energy resources.

GWP₁₀₀: 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

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Impact category	A1	A2	A3	C1	C2	C3	C4	D
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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

The Cradle-to-Gate scope equals the sum of modules A1+A2+A3.

Modules C1 to D are optional and can be taken into account depending on the type of data available.

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

When a value is negative, it means that no CO₂ is emitted.

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	
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	

For instance, if looking for the CO₂ equivalent emitted for our 304 CR on a Cradle-to-Gate scope from the perspective of a European stakeholder, one would look at the sum of modules A1+A2+A3.

$$1.24E+03 \Rightarrow 1.24 \times 10^3$$

$$1240 + 47.3 + 737 = 2024.3 \text{ kg CO}_2 \text{ eq. for 1 ton of 304 CR.}$$

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.



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:

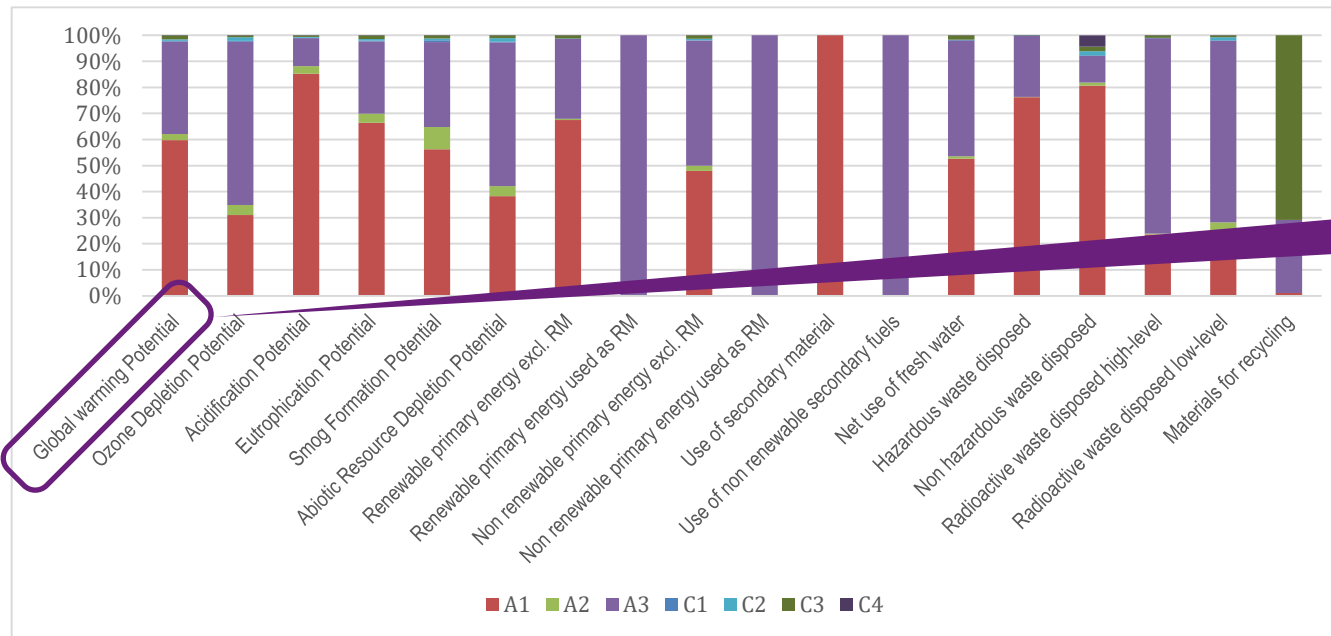


Figure 1: Distribution between the contributions of the different stages of the life cycle for non-zero indicators

This table lets us quickly see that 60% of the product's Global Warming Potential is due to the A1 Module, which is the raw material supply part of the product's life cycle.

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%



Environmental Product Declaration

aperam.com/sustainability/environmental-product-declaration/

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CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

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How Our EPDs Benefit You

REQUEST A QUOTE

EPDs outline the impact our products have across their lifecycle. They also help our customers make informed decisions about the stainless steel they purchase.

Aperam is a world-leading stainless-steel company with sustainability at its heart. As part of our environmental stewardship efforts, we use Environmental Product Declarations (EPD) to communicate about the environmental impact our products have across their lifecycle – including total carbon footprint and energy use throughout the supply chain.

But our EPDs are about more than just us – they also benefit our customers.

Based on an independently verified lifecycle assessment that follows ISO 14025, these EPDs allow our customers to make informed decisions about the stainless steel they purchase. Furthermore, they help our customers calculate the environmental impact of their own application's lifecycle. This last point can be of particular interest to the building and construction sector when working under a 'green building' regulation.

Regardless of sector, our EPDs help all end users become more sustainable. With the information contained in these documents, customers can ensure that their stainless steel suppliers are both efficient and sustainable. It also allows them to specify the material's country of origin on their own products and solutions.

In other words, our EPDs give you a unique competitive advantage.

EPDs are now available for these grade series (Aperam Stainless Europe's products):

- Cold Rolled – 304/304D/304ED (EN 1.4301) – 304H (EN 1.4948) – 304L (EN 1.4307) – 304M (1.4306) – 304LN (EN 1.4311/1.4315)
- Cold Rolled – K30 (EN 1.4016)

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304 series - Cold Rolled

K30 series - Cold Rolled

K41 series - Cold Rolled

304 series - Hot Rolled

304 series - Cold Rolled

K30 series - Cold Rolled



All our EPDs are available on our website:
www.aperam.com/sustainability/environmental-product-declaration/



K41 series - Cold Rolled

304 series - Hot Rolled



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