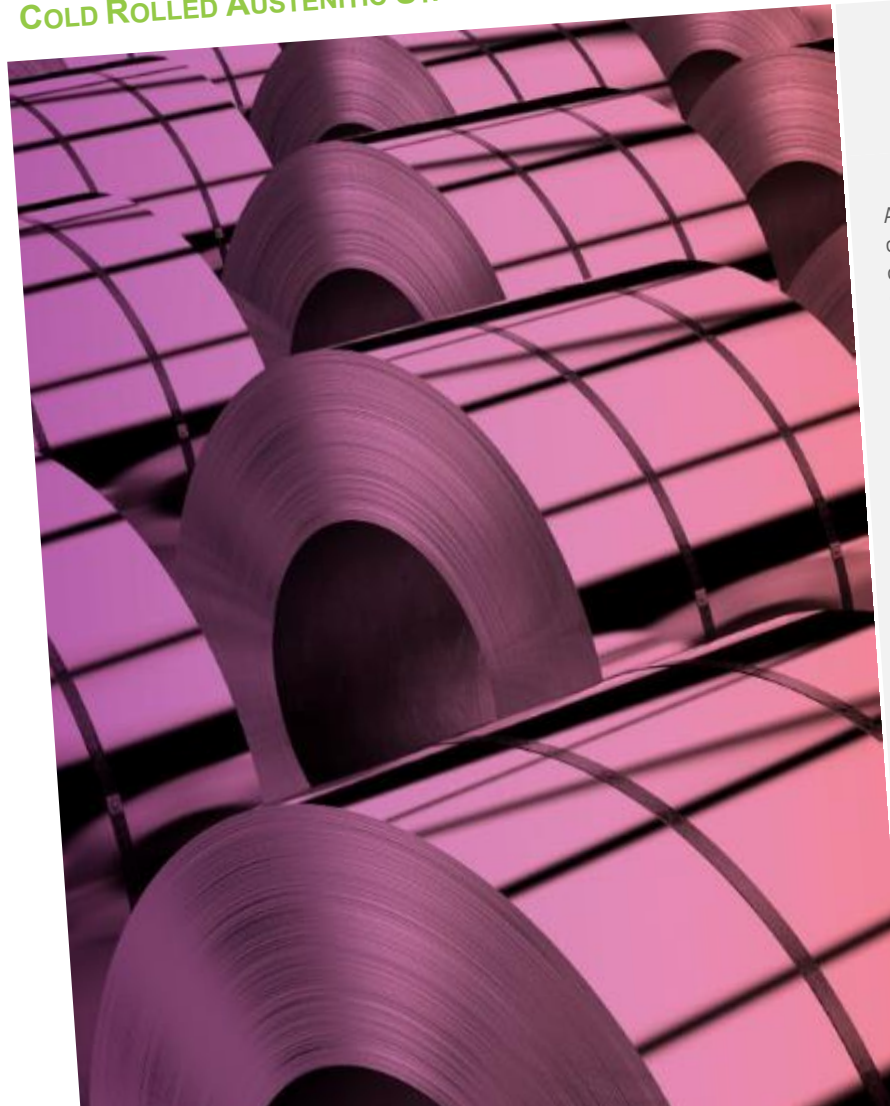


## ENVIRONMENTAL PRODUCT DECLARATION

### 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 14025, 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 green building regulations.

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.



# Cómo leer nuestras EPDs



## Cómo te benefician nuestras EPDs



Las EPDs describen el impacto de nuestros productos a lo largo de su ciclo de vida. También ayudan a nuestros clientes a tomar decisiones informadas sobre el acero inoxidable que compran.

Aperam es una empresa de acero inoxidable líder en el mundo, con la sostenibilidad como eje central. Como parte de nuestros esfuerzos de gestión ambiental, utilizamos las Declaraciones Ambientales de Producto (EPDs) para comunicar el impacto ambiental de nuestros productos a lo largo de su ciclo de vida, incluyendo la huella de carbono total y el uso de energía a lo largo de la cadena de suministro.

Pero nuestras EPDs no se limitan a nuestro perímetro: también benefician a nuestros clientes.

Basadas en un análisis independiente del ciclo de vida que sigue la norma ISO 14025, estas EPD permiten a nuestros clientes tomar decisiones informadas sobre el acero inoxidable que compran. Además, ayudan a nuestros clientes a calcular el impacto medioambiental del ciclo de vida de su propia aplicación. Este último punto puede ser de especial interés para el sector de la construcción cuando se trabaja bajo una normativa de "construcción verde".

Independientemente del sector, nuestras EPDs ayudan a todos los usuarios finales a ser más sostenibles. Con la información contenida en estos documentos, los clientes pueden asegurarse de que sus proveedores de acero inoxidable son eficientes y sostenibles. También les permite especificar el país de origen del material en sus propios productos y soluciones.

En otras palabras, nuestras EPDs procuran una ventaja competitiva única.



# 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	<b>Aperam</b> 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	

Esta información obligatoria se encuentra siempre en la primera página de la EPD.

Esto indica que toda la información contenida en esta EPD es para **1 tonelada métrica de 304 laminado en frío**.

Indica cuándo se emitió la EPD y cuándo la información que contiene quedará obsoleta o no será válida.

El nombre y la información de contacto del proveedor externo e independiente que ha verificado que la información contenida en la EPD es conforme con la 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 <sup>(1)</sup>	UNS 30400 / Type 304 <sup>(2)</sup>	✓	✓	✓	✓	✓	✓
304D	X5CrNi18-10 / 1.4301 <sup>(1)</sup>	UNS 30400 / Type 304 <sup>(2)</sup>	✓	✓		✓		
304ED	X5CrNi18-10 / 1.4301 <sup>(1)</sup>	UNS 30400 / Type 304 <sup>(2)</sup>	✓	✓				
304H	X6CrNi18-10 / 1.4948 <sup>(1)</sup>	UNS 30409 / Type 304 <sup>(2)</sup>	✓	✓				
304L	X2CrNi18-9 / 1.4307 <sup>(1)</sup>	UNS 30403 / Type 304L <sup>(2)</sup>	✓	✓	✓	✓		
304M	X2CrNi19-11 / 1.4306 <sup>(1)</sup>	UNS 30403 / Type 304L <sup>(2)</sup>	✓	✓				
304LN	X2CrNiN18-10 / 1.4311 <sup>(1)</sup> X5CrNiN19-9 / 1.4315 <sup>(1)</sup>	UNS 30453 / Type 304LN <sup>(2)</sup> UNS 30451 / Type 304N <sup>(2)</sup>	✓		✓			

Una lista detallada de los productos (calidades + acabados) cubiertos por la EPD.

<sup>(1)</sup>According to EN 100088-2; <sup>(2)</sup>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
<b>Declared modules</b>	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

MND: Module Not Declared

Los módulos

Aperam

Approvisionnement

Como esto varía en función del uso, esta información no se incluye en la EPD.

Los procesos que siguen después de que un producto termine de ser utilizado, incluyendo la recuperación de la chatarra hasta el taller de fundición.

El potencial de ahorro si se reutiliza la chatarra.

## 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 <sub>2</sub> 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 <sub>2</sub> 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 <sub>3</sub> 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 <sub>fossil</sub> [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 considered 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 <sub>2</sub> 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 <sub>2</sub> 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 <sub>4</sub> ) <sup>-3</sup> 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 <sub>elements</sub> [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 <sub>fossil fuels</sub> [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 <sub>2</sub> 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 <sub>4</sub> ) <sup>-3</sup> 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 <sub>2</sub> 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.

Dado que las distintas regiones tienen reglas diferentes para realizar los cálculos necesarios, Aperam ha adaptado sus tablas para atender a todos sus clientes en el mundo.



#### 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 <sub>2</sub> 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 <sub>2</sub> 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 <sub>3</sub> 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 <sub>fossil</sub> [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:** Potencial de calentamiento global, **ODP:** Potencial de agotamiento de la capa de ozono, **AP:** Potencial de Acidificación, **EP:** Potencial de eutrofización, **SFP:** Potencial de formación de smog, **ADP<sub>fossil</sub>:** Potencial de agotamiento de los recursos abióticos de los recursos energéticos no renovables (fósiles).

TABLE 9: EU LIFE CYCLE IMPACT ASSESSMENT RESULTS

Impact category	A1	A2	A3	C1	C2	C3	C4	D
GWP 100 [kg CO <sub>2</sub> 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 <sub>2</sub> 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 <sub>4</sub> ) <sup>-3</sup> 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 <sub>elements</sub> [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 <sub>fossil fuels</sub> [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 <sub>2</sub> 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 <sub>4</sub> ) <sup>-3</sup> 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 <sub>2</sub> 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:** Potencial de calentamiento global, **ODP:** Potencial de agotamiento de la capa de ozono estratosférico, **AP:** Potencial de acidificación del suelo y del agua, **EP:** Potencial de eutrofización, **POCP:** Potencial de creación de oxidantes fotoquímicos, **ADP<sub>elements</sub>:** Potencial de agotamiento abiótico (ADP-elementos) de los recursos no fósiles, **ADP<sub>fossil fuels</sub>:** Potencial de agotamiento abiótico (ADP-combustibles fósiles) para los recursos fósiles.

**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 <sub>E</sub> [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 <sub>M</sub> [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 <sub>E</sub> [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 <sub>M</sub> [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 <sup>3</sup> ]	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<sub>E</sub>: Recursos primarios renovables utilizados como soporte energético (combustible), RPR<sub>M</sub>: Recursos primarios renovables con contenido energético utilizados como materia, NRPR<sub>E</sub>: Recursos primarios no renovables utilizados como portador de energía (combustible), NRPR<sub>M</sub>: Recursos primarios no renovables con contenido energético utilizados como material, SM: Materiales secundarios, RSF: Combustibles secundarios renovables, NRSF: Combustibles secundarios no renovables, RE: Energía recuperada, FW: Utilización de recursos netos de agua dulce.

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: Residuos peligrosos eliminados, NHWD: Residuos no peligrosos eliminados, HLRW: Residuos radiactivos de alta actividad, acondicionados, hasta el depósito final, ILLRW: Residuos radiactivos de media y baja actividad, acondicionados, hasta el depósito final, CRU: Componentes para la reutilización, MR: Materiales para el reciclaje, MER: Materiales para la recuperación de energía, EE: Energía recuperada exportada del sistema de productos.

Abbreviations used in the results tables:

GWP<sub>100</sub>: Global Warming Potential, ODP: Ozone Depletion Potential, AP: Acidification Potential, ADP<sub>fossil</sub>: Abiotic Resource Depletion Potential of Non-renewable (fossil) energy resource

GWP<sub>100</sub>: 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 <sub>2</sub> 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 <sub>2</sub> 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 <sub>3</sub> 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 <sub>fossil</sub> [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

El alcance Cradle-to-Gate es igual a la suma de los módulos A1+A2+A3. Los módulos C1 a D son opcionales y pueden tenerse en cuenta en función del tipo de datos disponibles.

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 <sub>2</sub> 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 <sub>2</sub> 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 <sub>4</sub> ) <sup>-3</sup> 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 <sub>elements</sub> [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 <sub>fossil fuels</sub> [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 <sub>2</sub> 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 <sub>4</sub> ) <sup>-3</sup> 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 <sub>2</sub> 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

Cuando un valor es negativo, significa que no se emite CO<sub>2</sub>.

**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 <sub>2</sub> 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 <sub>2</sub> 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 <sub>3</sub> 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 <sub>fossil</sub> [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 <sub>2</sub> 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 <sub>2</sub> 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 <sub>4</sub> ) <sup>-3</sup> 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 <sub>elements</sub> [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 <sub>fossil fuels</sub> [MJ, LHV]	1.42E+04	6.22E+02	8.24E+03	5.01E+01	2.08E+02	3.47E+02	7.28E+01	

Por ejemplo, si se busca el equivalente de CO<sub>2</sub> emitido por nuestro 304 CR en un ámbito de aplicación "cradle-to-gate" desde la perspectiva de un cliente europeo, se miraría la suma de los módulos A1+A2+A3.

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

$$1240 + 47.3 + 737 = 2024.3 \text{ kg CO}_2 \text{ eq, para una tonelada de 304 CR.}$$

TABLE 10: REST OF WORLD LIFE CYCLE IMPACT ASSESSMENT RESULTS

Impact category	A1	A2	A3	C1	C2	C3	C4	D
GWP 100 [kg CO <sub>2</sub> 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 <sub>4</sub> ) <sup>-3</sup> 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 <sub>2</sub> 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:

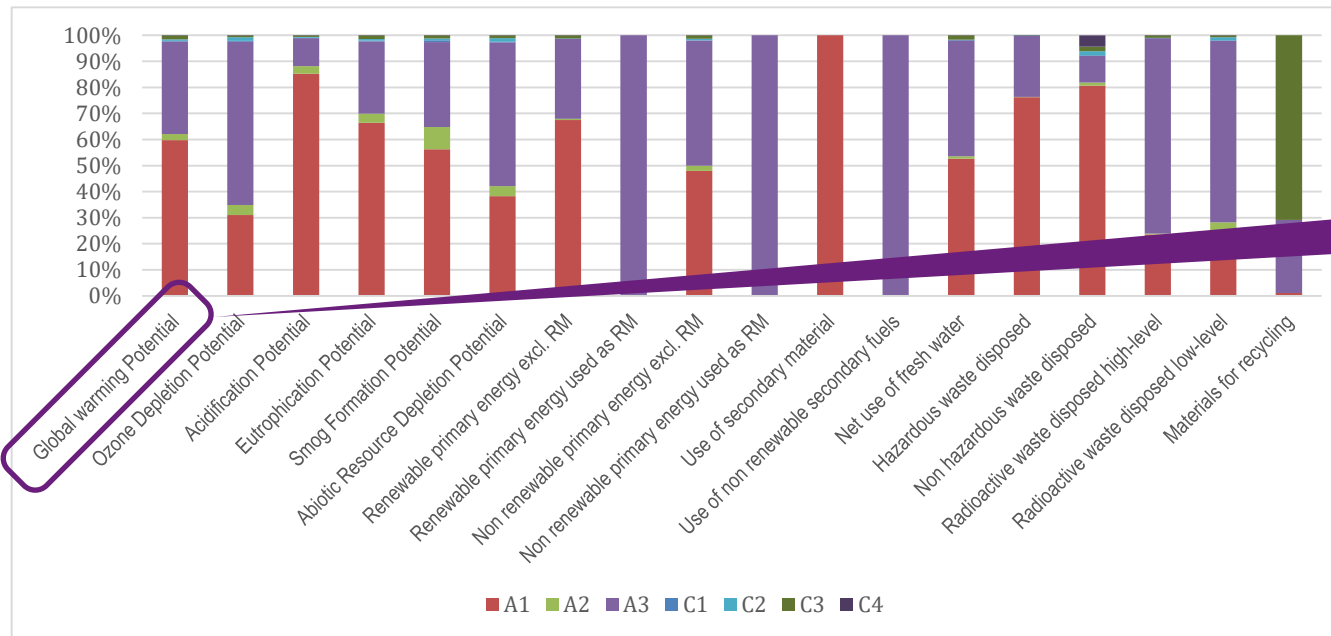


Figure 1: Distribution between the contributions of the different stages of the life cycle for non-zero indicators

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 <sub>2</sub> eq]	2.90%
ODP [kg CFC-11 eq]	7.35%
AP [kg SO <sub>2</sub> eq]	0.89%
EP [kg N eq]	4.27%
SFP [kg O <sub>3</sub> eq]	3.66%
ADP <sub>fossil</sub> [MJ, LHV]	6.23%

Esta tabla nos permite ver rápidamente que el 60% del Potencial de Calentamiento Global del producto se debe al Módulo A1, que es la parte de suministro de materia prima del ciclo de vida del producto.



Home → Declaraciones ambientales de producto

## Cómo beneficiarse de nuestras EPD

Solicitar una oferta



Las EPD describen el impacto que tienen nuestros productos a lo largo de su ciclo de vida. También ayudan a nuestros clientes a tomar decisiones informadas sobre el acero inoxidable que compran.

Aperam es una empresa de acero inoxidable líder en el mundo, con la sostenibilidad como columna vertebral. Como parte de nuestros esfuerzos de gestión ambiental, utilizamos las Declaraciones Ambientales de Producto (EPD en inglés) para comunicar el impacto ambiental de nuestros productos a lo largo de su ciclo de vida, incluyendo la huella de carbono total y el uso de energía a lo largo de la cadena de suministro. Pero nuestras EPD no se limitan a nuestro perímetro; también benefician a nuestros clientes. Basadas en un análisis independiente del ciclo de vida que sigue la norma ISO 14025, estas EPD permiten a nuestros clientes tomar decisiones informadas sobre el acero inoxidable que compran. Además, ayudan a nuestros clientes a calcular el impacto medioambiental del ciclo de vida de su propia aplicación. Este último punto puede ser de especial interés para el sector de la construcción cuando se trabaja bajo una normativa de «construcción verde». Independientemente del sector, nuestras EPD ayudan a todos los usuarios finales a ser más sostenibles. Con la información contenida en estos documentos, los clientes pueden asegurarse de que sus proveedores de acero inoxidable son eficientes y sostenibles. También les permite especificar el país de origen del material en sus propios productos y soluciones. En otras palabras, nuestras EPD proporcionan una ventaja competitiva única.

Las EPDs están ahora disponibles para esta serie de calidades

- Laminado en frío – 304/304D/304ED (EN 1.4301) – 304H (EN 1.4948) – 304L (EN 1.4307) – 304M (1.4306) – 304LN (EN 1.4311/1.4315)

DESCARGA

- Laminado en frío – K30 (EN 1.4016)

DESCARGA

- Laminado en frío – K41 (EN 1.4509)



304 series - Cold Rolled



K30 series - Cold Rolled



Todas nuestras EPDs son disponibles en nuestra web:

[www.aperam.com/sustainability/environmental-product-declaration/](http://www.aperam.com/sustainability/environmental-product-declaration/)



K41 series - Cold Rolled



304 series - Hot Rolled



[www.aperam.com](http://www.aperam.com)  
[stainless@aperam.com](mailto:stainless@aperam.com)

