

**Environmental
Product
Declaration**

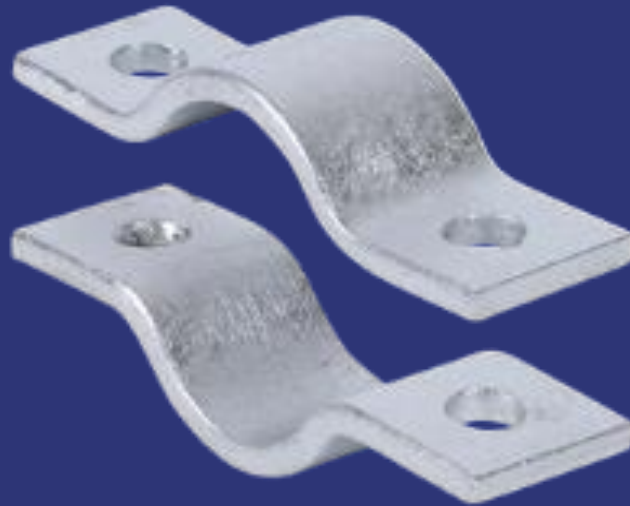
According to ISO14025+EN15804 A2 (+indicators A1)

This declaration is for:

**Walraven Split Band Clip (hot dip galvanized) Type A
1016mm**

Provided by:

J. van Walraven Holding B.V.



MRPI® registration:

1.1.00961.2025

Program operator:

Stichting MRPI®

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COMPANY INFORMATION

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MRPI® REGISTRATION

1.1.00961.2025

DATE OF THIS ISSUE

15-5-2025

EXPIRY DATE

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SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by Anne Kees Jeeninga , Advies Lab Vof. The LCA study has been done by Arunkumar Kuppusamy, J. van Walraven Holding B.V.. The certificate is based on an LCA-dossier according to ISO14025+EN15804 A2 (+indicators A1). It is verified according to the 'MRPI®-EPD verification protocol November 2020.v4.0'. EPDs of construction products may not be comparable if they do not comply with EN15804+A2. Declaration of SVHC that are listed on the 'Candidate list of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

PROGRAM OPERATOR

Stichting MRPI®
 Kingsfordweg 151
 1043 GR
 Amsterdam

PRODUCT

Walraven Split Band Clip (hot dip galvanized) Type A 1016mm

DECLARED UNIT / FUNCTIONAL UNIT

1 Piece

DESCRIPTION OF PRODUCT

The Walraven Split Band Clip (hot dip galvanized) Type A 1016mm is a durable, heavy-duty clamp designed for fixing pipes and tubes to steel beams, profiles, and brackets. Made from steel 1.0038 (S235JR) with hot dip galvanization for superior corrosion resistance, it ensures long-lasting performance. Each clamp is supplied as two clamp halves, while bolts, nuts, and washers are not included, allowing installation flexibility across a wide range of pipe diameters.

VISUAL PRODUCT



MORE INFORMATION

<https://www.walraven.com/int/products/standard-clamps/>

<p>Ing. L. L. Oosterveen MSc. MBA Managing Director MRPI</p>	<p>DEMONSTRATION OF VERIFICATION</p>
	<p>CEN standard EN15804 serves as the core PCR [1]</p>
	<p>Independent verification of the declaration an data according to ISO14025+EN15804 A2 (+indicators A1)</p> <p>Internal: External: X</p>
	<p>Third party verifier: Anne Kees Jeeninga , Advies Lab Vof</p>
<p>[1] PCR = Product Category Rules</p>	



DETAILED PRODUCT DESCRIPTION

Product Description:

The Walraven Split Band Clip (hot dip galvanized) Type A 1016 mm is a heavy-duty pipe clamp supplied in two clamp halves, designed for fixing pipes and tubes to steel beams, profiles, and brackets. Suitable for a wide range of common pipe diameters, this clamp provides a robust and reliable solution for demanding installations in industrial, commercial, and infrastructure environments. Bolts, nuts, and washers are not included, allowing installers to select the appropriate fastening components based on specific project requirements.

Manufacturing Location:

Manufactured in Czech Republic under strict quality and environmental management systems, ensuring compliance with international standards.

Manufacturing Process Overview:

The clamp is made from steel grade 1.0038 (S235JR), known for its high strength and structural reliability. The steel is cut, stamped, and shaped into clamp halves using precision tooling. After forming, the components undergo hot dip galvanization to provide a durable zinc coating that ensures long-lasting corrosion protection, particularly in exposed or heavy-duty applications.

Environmental Performance:

Hot dip galvanization delivers enhanced corrosion resistance, reducing the need for frequent replacements and extending service life. Steel and zinc are both recyclable materials, supporting resource efficiency and reducing environmental impact. Production aligns with standards for environmental management, optimizing energy use and minimizing emissions.

Installation and Use Phase:

Each clamp half is supplied separately and must be combined with suitable bolts, nuts, and washers (not included) for final assembly. Once installed, the clamp offers a secure and stable connection, even under heavy loads. It is ideal for applications where pipes or tubes must be safely attached to steel structures, ensuring reliability and safety.

End-of-Life Considerations:

The clamp can be easily disassembled, and both the steel and zinc materials can be recycled through standard industrial recycling systems, minimizing waste and supporting circular economy practices.

Name - Half parts	
Steel - Half Part Split Band Clip - Hot Dip Galvanized 50 -150 µm	

Total Weight	42560 g
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Component (> 1%)	(%)
Steel (combined)	99,00%





SCOPE AND TYPE

This study involves conducting a comprehensive Life Cycle Assessment (LCA) for the Walraven Clamps, aiming to analyze all life cycle phases from Cradle to Grave (A1–D) using the best available data. The assessment follows the full scope of LCA, meaning the product is evaluated not as a standalone item, but as part of a broader system aggregated with other materials and processed into other products. Consequently, the clamp becomes an integral component of a Declared Unit.

The LCA is performed using the Ecochain Helix software, leveraging background data from authoritative sources such as the Dutch Nationale Milieu Database v3.8 (based on Ecoinvent 3.6) and adhering to the NMD Bepalingsmethode 1.2 (2025) standard. This rigorous methodology ensures a detailed and transparent examination of the environmental impact of the Walraven Clamps across their entire life cycle from the extraction of raw materials (Cradle) through production, installation, and use, to final disposal or recycling (Grave).

The system boundary includes all relevant stages, up to and including Module D (benefits and loads beyond the system boundary). It excludes operational energy use (B6) and water consumption (B7) during the use phase. The environmental impact is declared per one piece of Walraven Clamp, inclusive of ancillary materials, installation, internal transport, and waste processing.

The reference service life is assumed to be 50 years, based on internal product owner data and supported by the European Technical Assessment (ETA) for Walraven Clamps, which confirms a minimum working life of 50 years under appropriate usage and maintenance conditions.

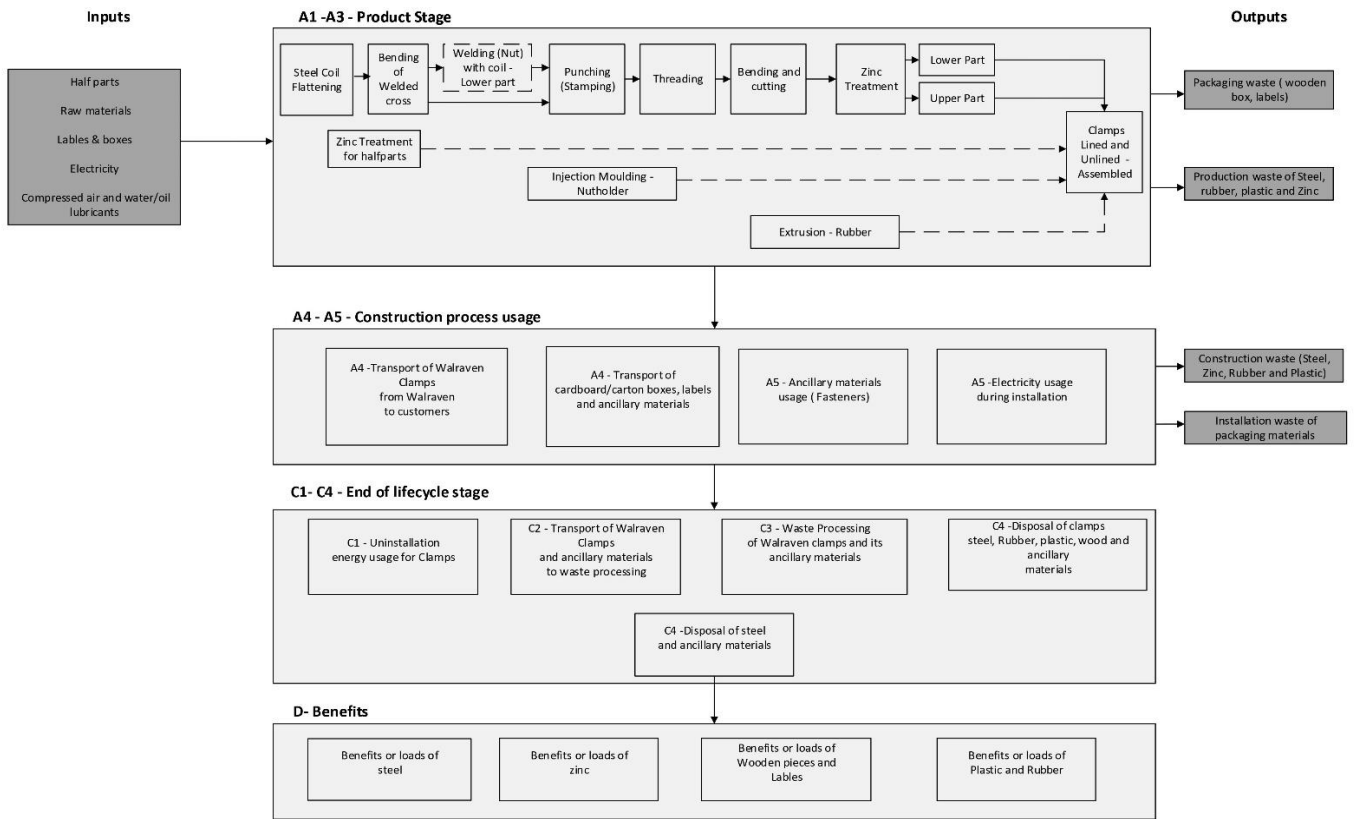
All significant inputs and outputs such as emissions, energy consumption, and material flows are accounted for. Materials representing less than 1% of the product's total weight may be excluded unless they are expected to contribute more than 5% to any environmental impact category. The cumulative environmental impact of excluded materials shall not exceed 5% for any given category.

This comprehensive approach ensures a scientifically sound and holistic understanding of the Walraven Clamp's environmental footprint throughout its full life cycle.

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport gate to site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction 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	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x

X = Modules Assessed
 ND = Not Declared





REPRESENTATIVENESS

The aggregation was done by choosing the reference product as Walraven Split Band Clip (hot dip galvanized) Type A 1016mm. The remaining products which are aggregated in the same group by following the 20% allocation and worst-case scenario as per EN 15804+A2 and NMD Bepalingsmethode v1.2 (2025) are listed below:

- Walraven Split Band Clip (untreated) Type A 1016 (1009 - 1016)
- Walraven Split Band Clip (hot dip galvanized) Type A 914mm
- Walraven Split Band Clip (untreated) Type A 914 (907 - 914)
- Walraven Split Band Clip (hot dip galvanized) Type A 813mm
- Walraven Split Band Clip (untreated) Type A 813 (806 - 813)
- Walraven Split Band Clip (hot dip galvanized) Type A 711mm
- Walraven Split Band Clip (untreated) Type A 711 (704 - 711)



ENVIRONMENTAL IMPACT per functional unit or declared unit (indicators A1)

Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADPE kg Sb eq.	1,35E-01	6,52E-05	4,33E-06	1,35E-01	2,18E-05	6,76E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,64E-05	5,83E-05	1,03E-07	-2,13E-05
ADPF MJ	1,96E+03	3,90E+01	5,67E+00	2,55E+06	1,31E+01	8,40E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,18E+01	1,42E+01	3,11E-01	-3,77E+02
GWP kg CO2 eq.	1,34E+02	2,55E+00	4,21E-01	1,37E+02	8,54E-01	5,55E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,42E+00	1,04E+00	1,10E-02	-2,94E+01
ODP kg CFC11 eq.	1,08E-05	4,53E-07	2,37E-08	1,13E-05	1,52E-07	5,40E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,53E-07	1,30E-07	3,66E-09	-1,02E-06
POCP kg ethene eq.	1,63E-01	1,54E-03	-1,21E-04	1,65E-01	5,15E-04	5,17E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,59E-04	9,16E-04	1,17E-05	-6,39E-02
AP kg SO2 eq.	9,65E-01	1,12E-02	1,42E-03	9,77E-01	3,76E-03	4,49E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,26E-03	1,02E-02	8,04E-05	-9,95E-02
EP kg (PO4) 3 eq.	1,66E-01	2,20E-03	3,03E-04	1,68E-01	7,38E-04	7,99E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,23E-03	1,30E-03	1,55E-05	-1,18E-02

Toxicity indicators and ECI (Dutch market)

HTP kg DCB eq.	6,45E+01	1,07E+00	-1,65E-02	6,55E+01	3,60E-01	2,47E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,99E-01	1,26E+00	4,97E-03	-1,84E+01
FAETP kg DCB eq.	1,18E+00	3,14E-02	2,02E-03	1,21E+00	1,05E-02	7,45E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,75E-02	2,34E-02	1,18E-04	2,28E-01
MAETP kg DCB eq.	3,24E+03	1,13E+02	1,03E+01	3,36E+03	3,78E+01	1,88E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,30E+01	1,02E+02	4,22E-01	1,91E+02
TETP kg DCB eq.	3,61E-01	3,80E-03	2,03E-03	3,67E-01	1,27E-03	9,55E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,12E-03	3,92E-03	1,25E-05	1,54E+00
ECI euro	1,87E+01	3,08E-01	2,94E-02	1,91E+01	1,03E-01	7,96E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,72E-01	2,32E-01	1,55E-03	-3,67E+00
ADPF kg Sb eq.	9,44E-01	1,88E-02	2,73E-03	1,23E+03	6,28E-03	4,04E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,05E-02	6,83E-03	1,50E-04	-1,82E-01

- ADPE = Abiotic Depletion Potential for non-fossil resources
- ADPF = Abiotic Depletion Potential for fossil resources
- GWP = Global Warming Potential
- ODP = Depletion potential of the stratospheric ozone layer
- POCP = Formation potential of tropospheric ozone photochemical oxidants
- AP = Acidification Potential of land and water
- EP = Eutrophication Potential
- HTP = Human Toxicity Potential
- FAETP = Fresh water aquatic ecotoxicity potential
- MAETP = Marine aquatic ecotoxicity potential
- TETP = Terrestrial ecotoxicity potential
- ECI = Environmental Cost Indicator
- ADPF = Abiotic Depletion Potential for fossil resources

ENVIRONMENTAL IMPACT per functional unit or declared unit (core indicators A2)

Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total kg CO2 eq.	1,39E+02	2,58E+00	4,18E-01	1,42E+02	8,62E-01	5,70E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,44E+00	7,87E-01	1,12E-02	-3,15E+01
GWP-fossil kg CO2 eq.	1,39E+02	2,57E+00	4,17E-01	1,42E+02	8,62E-01	5,68E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,44E+00	1,05E+00	1,12E-02	-3,15E+01
GWP-biogenic kg CO2 eq.	2,47E-01	9,60E-04	6,73E-04	2,49E-01	3,21E-04	1,49E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,36E-04	-2,65E-01	6,55E-06	0,00E+00
GWP-luluc kg CO2 eq.	1,07E-01	9,43E-04	4,35E-04	1,08E-01	3,16E-04	6,67E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,26E-04	1,18E-03	3,12E-06	2,33E-02
ODP kg CFC11 eq.	1,07E-05	5,68E-07	1,85E-08	1,13E-05	1,90E-07	5,58E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,17E-07	1,51E-07	4,61E-09	-7,70E-07
AP mol H+ eq.	1,47E+00	1,49E-02	1,70E-03	1,49E+00	5,00E-03	6,97E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,33E-03	1,27E-02	1,06E-04	-1,22E-01
EP-fresh water kg PO4 eq.	7,08E-03	2,60E-05	7,01E-05	7,17E-03	8,69E-06	3,08E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,45E-05	7,16E-05	1,26E-07	-1,11E-03
EP-marine kg N eq.	1,43E-01	5,26E-03	2,39E-04	1,48E-01	1,76E-03	6,65E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,93E-03	2,81E-03	3,66E-05	-2,26E-02
EP-terrestrial mol N eq.	5,06E+00	5,80E-02	2,91E-03	5,12E+00	1,94E-02	2,47E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,24E-02	3,26E-02	4,03E-04	-2,63E-01
POCP kg NMVOC eq.	5,73E-01	1,66E-02	3,78E-04	5,90E-01	5,54E-03	2,17E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,24E-03	8,90E-03	1,17E-04	-1,79E-01
ADP-minerals & metals kg Sb eq.	1,35E-01	6,52E-05	4,33E-06	1,35E-01	2,18E-05	6,76E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,64E-05	5,83E-05	1,03E-07	-2,13E-05
ADP-fossil MJ, net calorific value	1,75E+03	3,88E+01	6,13E+00	1,80E+03	1,30E+01	8,13E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,17E+01	1,46E+01	3,13E-01	-2,20E+02
WDP m3 world eq. Deprived	4,05E+01	1,39E-01	9,11E-02	4,08E+01	4,65E-02	1,75E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,75E-02	1,47E-01	1,40E-02	-6,01E+00

GWP-total	=	Global Warming Potential total
GWP-fossil	=	Global Warming Potential fossil fuels
GWP-biogenic	=	Global Warming Potential biogenictotal
GWP-luluc	=	Global Warming Potential land use and land use change
ODP	=	Depletion potential of the stratospheric ozone layer
AP	=	Acidification Potential, Accumulated Exceedence
EP-freshwater	=	Eutrophication Potential, fraction of nutrients reaching freshwater end compartment
EP-marine	=	Eutrophication Potential, fraction of nutrients reaching marine end compartment
EP-terrestrial	=	Eutrophication Potential, Accumulated Exceedence
POCP	=	Formation potential of tropospheric ozone photochemical oxidants
ADP-minerals & metals	=	Abiotic Depletion Potential for non-fossil resources [1]
ADP-fossil	=	Abiotic Depletion for fossil resources potential [1]
WDP	=	Water (user) deprivation potential, deprivation-weighted water consumption [1]

Disclaimer [1]:

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

ENVIRONMENTAL IMPACT per functional unit or declared unit (additional indicators A2)

Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM Disease incidence	1,42E-05	2,31E-07	-6,73E-09	1,44E-05	7,74E-08	6,50E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,29E-07	1,60E-07	2,06E-09	-1,82E-06
IRP kBq U235 eq.	6,71E+00	1,63E-01	3,45E-02	6,91E+00	5,44E-02	3,83E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,07E-02	7,25E-02	1,29E-03	5,39E-01
ETP-fw CTUe	4,36E+03	3,46E+01	3,17E-01	4,39E+03	1,16E+01	1,72E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,93E+01	6,26E+01	2,03E-01	-1,06E+03
HTP-c CTUh	4,80E-07	1,12E-09	-5,83E-10	4,81E-07	3,76E-10	2,40E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,27E-10	1,53E-09	4,70E-12	-4,03E-09
HTP-nc CTUh	4,36E-06	3,78E-08	1,62E-10	4,39E-06	1,27E-08	5,30E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,11E-08	7,25E-08	1,44E-10	6,11E-06
SQP -	4,21E+02	3,37E+01	1,67E+00	4,56E+02	1,13E+01	2,34E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,88E+01	2,93E+01	6,57E-01	-4,87E+01

- PM = Potential incidence of disease due to PM emissions
- IRP = Potential Human exposure efficiency relative to U235 [1]
- ETP-fw = Potential Comparative Toxic Unit for ecosystems [2]
- HTP-c = Potential Comparative Toxic Unit for humans, cancer [2]
- HTP-nc = Potential Comparative Toxic Unit for humans, non-cancer [2]
- SQP = Potential soil quality index [2]

Disclaimer [1]:

- This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste.

Disclaimer [2]:

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

OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 en A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	2,52E-02	9,83E-05	-7,74E-06	2,53E-02	3,29E-05	1,08E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,49E-05	4,39E-05	4,68E-07	-3,78E-03
NHWD	kg	1,94E+01	2,46E+00	3,37E-02	2,19E+01	8,24E-01	1,18E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,37E+00	4,25E-01	2,13E+00	-3,09E+00
RWD	kg	6,37E-03	2,55E-04	2,89E-05	6,65E-03	8,53E-05	3,58E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,42E-04	8,62E-05	2,06E-06	1,87E-04
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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	2,64E-04	2,64E-04	0,00E+00	1,32E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,04E+01	0,00E+00
MER	kg	0,00E+00	0,00E+00	1,60E-05	1,60E-05	0,00E+00	8,01E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	9,23E-04	9,23E-04	0,00E+00	4,61E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	5,37E-04	5,37E-04	0,00E+00	2,68E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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
- RWD = Radioactive Waste Disposed
- CRU = Components for reuse
- MFR = Materials for recycling
- MER = Materials for energy recovery
- EEE = Exported Electrical Energy
- ETE = Exported Thermal Energy

RESOURCE USE per functional unit or declared unit (A1 and A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,37E+02	4,86E-01	6,87E-01	1,38E+02	1,63E-01	7,37E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,71E-01	2,28E+00	2,53E-03	6,40E+00
PERM	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,37E+02	4,86E-01	6,87E-01	1,38E+02	1,63E-01	7,37E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,71E-01	2,28E+00	2,53E-03	6,40E+00
PENRE	MJ	1,86E+03	4,12E+01	6,61E+00	1,90E+03	1,38E+01	8,64E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,30E+01	1,54E+01	3,33E-01	-2,28E+02
PENRM	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,86E+03	4,12E+01	6,61E+00	1,90E+03	1,38E+01	8,64E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,30E+01	1,54E+01	3,33E-01	-2,28E+02
SM	kg	1,83E+01	0,00E+00	7,72E-05	1,83E+01	0,00E+00	3,86E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NSRF	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	0,00E+00	0,00E+00	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	m3	1,33E+00	4,73E-03	1,14E-02	1,35E+00	1,58E-03	6,22E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,64E-03	6,91E-03	3,35E-04	-1,14E-01

- PERE = Use of renewable primary energy excluding renewable primary energy 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 resources excluding non-renewable 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 materials
- RSF = Use of renewable secondary fuels
- NSRF = Use of non-renewable secondary fuels
- FW = Use of net fresh water

BIOGENIC CARBON CONTENT per functional unit or declared unit (A1 and A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
BBCpr	kg C	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
BCCpa	kg C	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

- BCCpr = Biogenic carbon content in product
- BCCpa = Biogenic carbon content in packaging

CALCULATION RULES

Data Quality

Data flows have been modeled as realistically as possible. Primary data from Walraven's Czech production site was prioritized, with verified background datasets used where site-specific data was unavailable.

Data Collection

Product composition for Module A1 was provided directly by the manufacturer. Module A2 includes actual transport distances and modes for raw materials. Module A3 incorporates measured energy use, production waste, and emissions from the 2023/2024 production year. Background processes were sourced from the Dutch Nationale Milieudatabase v3.8, based on Ecoinvent 3.6.

Methodology and Reproducibility

The LCA was conducted following EN 15804+A2:2019, ISO 14040, ISO 14044, ISO 14025, and the NMD Bepalingsmethode v1.2 (2025). Modeling and calculations were performed using Ecochain Helix software version 4.3.1. Assessed life cycle modules include A1–A3 (raw materials, transport, manufacturing), A4–A5 (transport to site and installation), C1–C4 (end-of-life processing and disposal), and D (reuse, recovery, and recycling potential).

Inventory and Allocation

All material flows, energy use, emissions, and waste streams were accounted for. Allocation follows the EN 15804 modular approach using mass-based allocation. No secondary materials were used, and cut-off criteria ensured no more than 5% of mass or energy flows per module were excluded.

Data Sources

Primary data was collected from Walraven's Czech facility, including material types, quantities, energy use, transport distances, and emissions. Where supplier-specific environmental data was unavailable, background datasets from Ecoinvent 3.6 and NMD v3.8 were used. Transport data includes both road and sea distances, and zinc coating transport and treatment (typically 100 km). Environmental impact categories were characterized using CML and EF 3.0 methods where applicable.



SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

Modules A1 to A3 cover the life cycle stages beginning with raw material acquisition and upstream processes. Module A1 models the sourcing and processing of all raw and auxiliary materials used in manufacturing the Walraven Split Band Clip (hot dip galvanized) Type A 1016mm. The primary materials used in the product include several grades of steel. The bill of materials was based on 2023/2024 production data. Life cycle modeling references include the Nationale Milieudatabase (NMD) v3.8 and Ecoinvent v3.6. Steel was modeled with a market average composition of 57% primary and 43% secondary content.

Module A2 addresses transport of raw materials to the Walraven production facility in the Czech Republic. While specific distances per material are documented in the background report, all transport scenarios are modeled using standard EN 15804+A2 assumptions and data from Ecoinvent and NMD databases. A 50% load factor is assumed (loaded inbound, empty return), and unspecified lorry datasets were applied across the materials.

Module A3 analyzes the manufacturing process, incorporating site-specific data on electricity consumption, zinc treatment energy, lubricating oil use, steel scrap generation, and process emissions. The electricity mix includes both local grid electricity and energy required for zinc coating processes. Steel waste and internal recycling are modeled proportionally, and lubricating oil is used as an auxiliary input. Capital goods are excluded based on the EN 15804+A2 cutoff rule, as their contribution falls below 5% of total impact.

Module A4 models distribution of the finished clamp to the point of installation. A standardized average distance of 150 km is assumed in accordance with the Bepalingsmethode v1.2. The transport model uses a 50% truck load factor and references the dataset 0001-tra&Transport, vrachtwagen from NMD v3.8 and Ecoinvent v3.6.

Module A5 includes manual installation of the product, with a 5% material loss rate assumed for steel and plastic components due to on-site inefficiencies. No additional energy is required for installation. Waste from this process is transported: steel and zinc 100 km to landfill or recycling, and plastic (POM) 100 km to AVI incineration facilities. These assumptions follow fixed waste treatment fractions defined in the Bepalingsmethode v1.2.

End-of-Life Scenario Fixed Values used:

Material	Leave	Landfill	Incineration (AVI)	Recycling	Reuse
Steel, Zinc	0%	5%	0%	95%	0%
Rubber/Plastic	0%	0%	100%	0%	0%

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION (PART 2)

Module C1 assumes the clamp is manually uninstalled at end-of-life with no energy requirements.

Module C2 models transport of waste: steel and zinc travel 50 km to recycling/landfill; plastic travels 100 km to incineration facilities.

Module C3 processes waste materials: steel and zinc are 100% recycled, while plastics are incinerated with energy recovery.

Module C4 reflects final disposal: 5% of steel and zinc go to landfill; all plastic is incinerated.

Module D accounts for environmental benefits of material recycling beyond the life cycle boundary. Recycled steel is credited using a substitution efficiency of 52% (based on 95% recycling and 43% already secondary content). Zinc recycling is modeled with a 95% efficiency. Plastics are assumed to contribute 100% energy substitution through AVI incineration.

This modeling approach follows EN 15804+A2:2019 + AC:2021 and is consistent with Bepalingsmethode v1.2 (2025). All datasets are derived from NMD v3.8 and Ecoinvent v3.6, and system boundaries are set per EN 15804's modular framework, ensuring comparability with similarly structured EPDs.



DECLARATION OF SVHC

No substances that are listed in the latest "Candidate List of Substances of Very High Concern for authorisation" are included in the product that exceeds the limit for registration

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