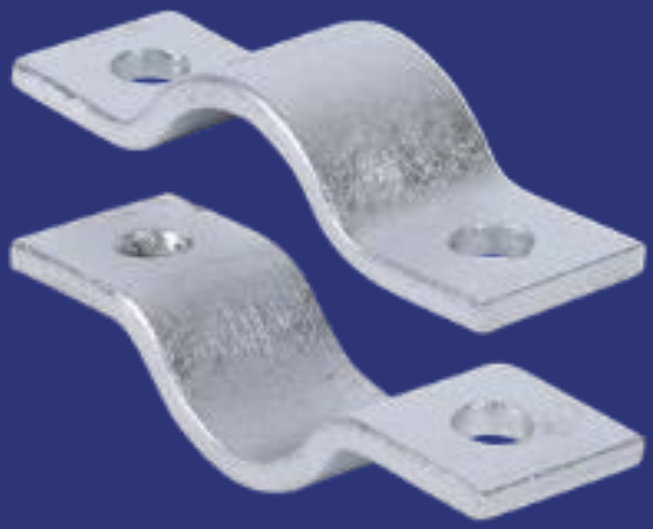
Environmental
Product
Declaration

According to ISO14025+EN15804 A2 (+indicators A1)

This declaration is for:
Walraven Split Band Clip DIN 3567 (hdg) Type A 356

Provided by:
J. van Walraven Holding B.V.



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COMPANY INFORMATION

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MRPI® REGISTRATION

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15-5-2025

EXPIRY DATE

15-5-2030

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 DIN 3567 (hdg) Type A 356

DECLARED UNIT / FUNCTIONAL UNIT

1 Piece

DESCRIPTION OF PRODUCT

The Walraven DIN3567 Type A Clamp (hot-dip galvanized) is a heavy-duty solution for fixing pipes and tubes to steel beams, profiles, and brackets. Supplied as two clamp halves, it is designed for common pipe diameters and provides strong, durable support in demanding applications. Manufactured from S235JR steel and hot-dip galvanized for corrosion resistance, the clamp ensures reliable performance. Bolts, nuts, and washers are supplied separately.

VISUAL PRODUCT

MORE INFORMATION

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

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

DETAILED PRODUCT DESCRIPTION

Product Description:
The Walraven DIN 3567 Type A Clamp (Hot Dip Galvanized) 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 Horka, 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.

Electricity usage references:
Reference: 0569-pro & Elektriciteit, Nederlandse mix, bij consument, per kWh (73% grijs, 27% hernieuwbaar), Database: Ecoinvent v3.6 (Cut-off, NMD), GWP : 0.389 kg CO_2eq/kWh

Reference: market for electricity, low voltage | electricity, low voltage | Czech Republic, Database: Ecoinvent v3.6 (Cut-off, NMD), GWP : 0.936 kg CO2-eq/kWh

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. The necessary internal transport of Czech Republic to Netherlands has been accounted in the production process of A1-A3.

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	5090 g

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.

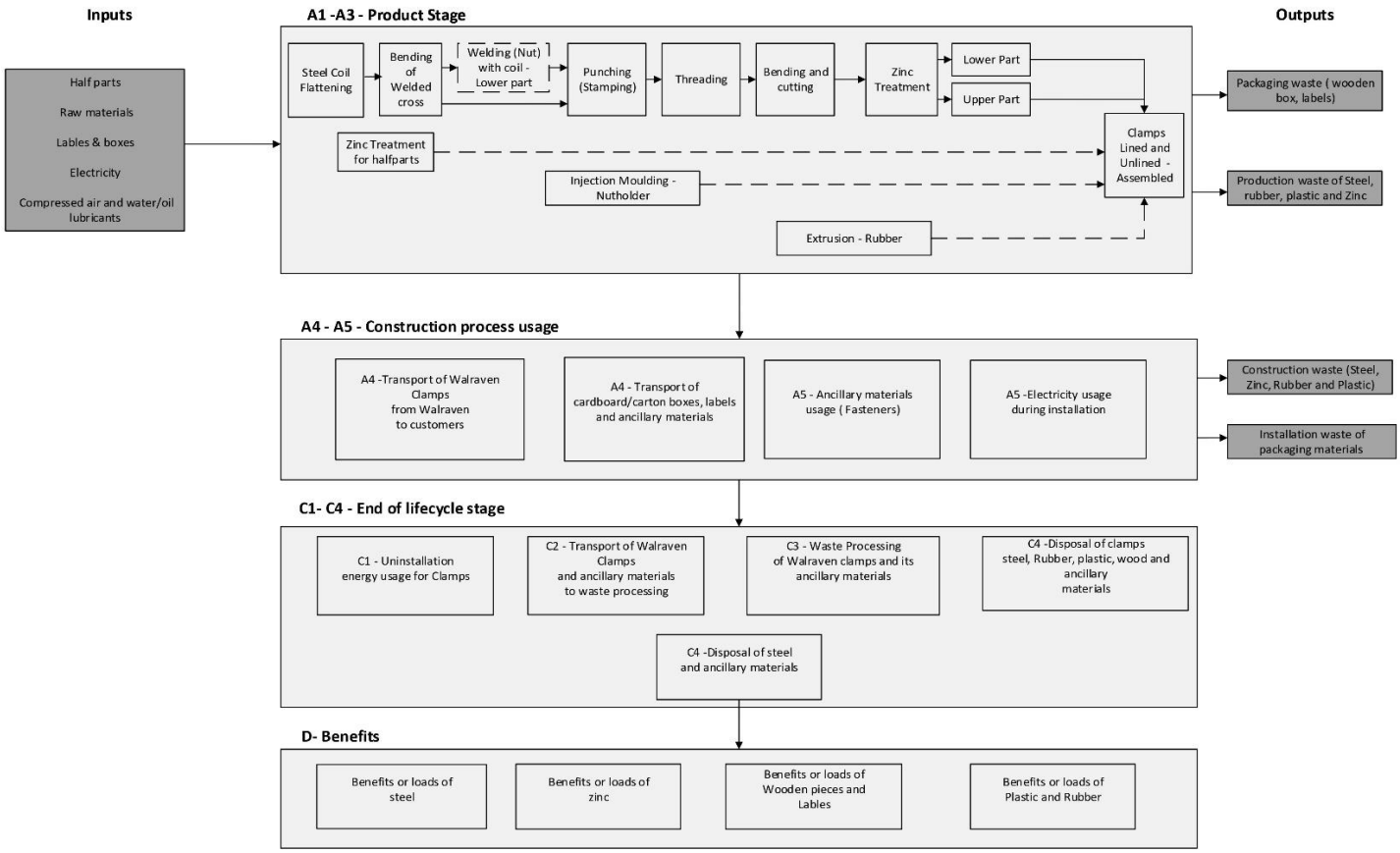
All significant inputs and outputs such as emissions, energy consumption, and material flows are accounted for. Materials representing less than 1% of the product's total weight may be excluded unless they are expected to contribute more than 5% to any environmental impact category. The cumulative environmental 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 asWalraven Split Band Clip DIN 3567 (hdg) Type A 356. 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 DIN 3567 (untreated) Type A 356 (351 - 356 mm)
Walraven Split Band Clip DIN 3567 (hdg) Type A 324
Walraven Split Band Clip DIN 3567 (untreated) Type A 324 (319 - 324 mm)
Walraven Heavy Duty Clamp Stainless M12 115-123mm
Walraven HD500 Clamp BUP VdS DN15 M8/10 1/2"
Walraven Split Band Clip DIN 3567 (hdg) Type A 273
Walraven Split Band Clip DIN 3567 (untreated) Type A 273 (268 - 273 mm
Walraven Heavy Duty Clamp Stainless M12 DN100 4" 108-116mm
Walraven HD500 Clamp BUP VdS DN32 M8/10 1 1/4"
Walraven W1000 Strut Clamp ZnMg 56-60mm
Walraven HD500 Clamp BUP VdS DN40 M8/10 1 1/2"

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.	1,62E-02	7,80E-06	4,33E-06	1,62E-02	2,61E-06	8,09E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,35E-06	6,97E-06	1,23E-08	-2,55E-06
ADPF	MJ	2,35E+02	4,67E+00	5,67E+00	3,06E+05	1,56E+00	1,03E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,60E+00	1,70E+00	3,72E-02	-4,51E+01
GWP	kg CO2 eq.	1,60E+01	3,05E-01	4,21E-01	1,68E+01	1,02E-01	6,82E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,70E-01	1,24E-01	1,32E-03	-3,52E+00
ODP	kg CFC11 eq.	1,29E-06	5,41E-08	2,37E-08	1,37E-06	1,81E-08	6,57E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,02E-08	1,55E-08	4,38E-10	-1,23E-07
POCP	kg ethene eq.	1,96E-02	1,84E-04	-1,21E-04	1,96E-02	6,17E-05	6,12E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,03E-04	1,09E-04	1,40E-06	-7,64E-03
AP	kg SO2 eq.	1,15E-01	1,34E-03	1,42E-03	1,18E-01	4,49E-04	5,43E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,49E-04	1,22E-03	9,62E-06	-1,19E-02
EP	kg (PO4) 3 eq.	1,98E-02	2,64E-04	3,03E-04	2,04E-02	8,83E-05	9,69E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,47E-04	1,56E-04	1,86E-06	-1,41E-03

Toxicity indicators and ECI (Dutch market)

HTP	kg DCB eq.	7,71E+00	1,28E-01	-1,65E-02	7,82E+00	4,30E-02	2,95E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,17E-02	1,51E-01	5,95E-04	-2,20E+00
FAETP	kg DCB eq.	1,41E-01	3,75E-03	2,02E-03	1,46E-01	1,26E-03	8,99E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,09E-03	2,80E-03	1,41E-05	2,73E-02
MAETP	kg DCB eq.	3,87E+02	1,35E+01	1,03E+01	4,11E+02	4,52E+00	2,29E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,53E+00	1,22E+01	5,04E-02	2,28E+01
TETP	kg DCB eq.	4,32E-02	4,54E-04	2,03E-03	4,57E-02	1,52E-04	1,15E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,53E-04	4,69E-04	1,49E-06	1,84E-01
ECI	euro	2,24E+00	3,68E-02	2,94E-02	2,31E+00	1,23E-02	9,65E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,05E-02	2,77E-02	1,86E-04	-4,39E-01
ADPF	kg Sb eq.	1,13E-01	2,24E-03	2,73E-03	1,47E+02	7,51E-04	4,95E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,25E-03	8,17E-04	1,79E-05	-2,17E-02

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.	1,66E+01	3,08E-01	4,18E-01	5,97E+00	1,03E-01	7,00E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,72E-01	9,35E-02	1,34E-03	-3,77E+00
GWP-fossil	kg CO2 eq.	1,66E+01	3,08E-01	4,17E-01	5,93E+00	1,03E-01	6,98E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,72E-01	1,26E-01	1,34E-03	-3,77E+00
GWP-biogenic	kg CO2 eq.	2,96E-02	1,15E-04	6,73E-04	2,45E-02	3,84E-05	1,81E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,41E-05	-3,23E-02	7,84E-07	0,00E+00
GWP-luluc	kg CO2 eq.	1,28E-02	1,13E-04	4,35E-04	1,09E-02	3,78E-05	8,17E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,29E-05	1,41E-04	3,74E-07	2,78E-03
ODP	kg CFC11 eq.	1,28E-06	6,79E-08	1,85E-08	1,36E-06	2,27E-08	6,75E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,79E-08	1,80E-08	5,52E-10	-9,20E-08
AP	mol H+ eq.	1,76E-01	1,78E-03	1,70E-03	1,80E-01	5,98E-04	8,41E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,96E-04	1,52E-03	1,27E-05	-1,45E-02
EP-fresh water	kg PO4 eq.	8,46E-04	3,10E-06	7,01E-05	9,19E-04	1,04E-06	3,99E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,73E-06	8,56E-06	1,50E-08	-1,33E-04
EP-marine	kg N eq.	1,70E-02	6,29E-04	2,39E-04	1,79E-02	2,11E-04	8,06E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,51E-04	3,36E-04	4,38E-06	-2,70E-03
EP-terrestrial	mol N eq.	6,05E-01	6,93E-03	2,91E-03	6,15E-01	2,32E-03	2,97E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,87E-03	3,90E-03	4,82E-05	-3,15E-02
POCP	kg NMVOC eq.	6,85E-02	1,98E-03	3,78E-04	7,09E-02	6,63E-04	2,61E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,10E-03	1,06E-03	1,40E-05	-2,14E-02
ADP-minerals & metals	kg Sb eq.	1,62E-02	7,80E-06	4,33E-06	1,62E-02	2,61E-06	8,09E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,35E-06	6,97E-06	1,23E-08	-2,55E-06
ADP-fossil	MJ, net calorific value	2,09E+02	4,64E+00	6,13E+00	2,20E+02	1,55E+00	9,99E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,59E+00	1,74E+00	3,75E-02	-2,63E+01
WDP	m3 world eq. Deprived	4,85E+00	1,66E-02	9,11E-02	4,96E+00	5,56E-03	2,14E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,26E-03	1,75E-02	1,68E-03	-7,19E-01

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 inci-dence	1,70E-06	2,76E-08	-6,73E-09	1,72E-06	9,25E-09	7,74E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,54E-08	1,91E-08	2,47E-10	-2,18E-07
IRP	kBq U235 eq.	8,03E-01	1,94E-02	3,45E-02	8,57E-01	6,51E-03	4,74E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,09E-02	8,67E-03	1,54E-04	6,44E-02
ETP-fw	CTUe	5,21E+02	4,14E+00	3,17E-01	5,26E+02	1,39E+00	2,05E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,31E+00	7,49E+00	2,43E-02	-1,26E+02
HTP-c	CTUh	5,74E-08	1,34E-10	-5,83E-10	5,70E-08	4,50E-11	2,84E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,49E-11	1,83E-10	5,62E-13	-4,82E-10
HTP-nc	CTUh	5,21E-07	4,53E-09	1,62E-10	5,26E-07	1,52E-09	6,34E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,53E-09	8,67E-09	1,73E-11	7,31E-07
SQP	-	5,03E+01	4,03E+00	1,67E+00	5,60E+01	1,35E+00	2,87E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,25E+00	3,50E+00	7,86E-02	-5,82E+00

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	3,01E-03	1,18E-05	-7,74E-06	3,01E-03	3,94E-06	1,29E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,56E-06	5,25E-06	5,60E-08	-4,52E-04
NHWD	kg	2,32E+00	2,94E-01	3,37E-02	2,65E+00	9,86E-02	1,43E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,64E-01	5,09E-02	2,54E-01	-3,69E-01
RWD	kg	7,62E-04	3,05E-05	2,89E-05	8,21E-04	1,02E-05	4,41E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,70E-05	1,03E-05	2,46E-07	2,23E-05
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	4,84E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	1,60E-05	1,60E-05	0,00E+00	8,01E-07	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	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	1,64E+01	5,81E-02	6,87E-01	1,71E+01	1,95E-02	9,11E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,24E-02	2,73E-01	3,03E-04	7,65E-01
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,64E+01	5,81E-02	6,87E-01	1,71E+01	1,95E-02	9,11E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,24E-02	2,73E-01	3,03E-04	7,65E-01
PENRE	MJ	2,22E+02	4,93E+00	6,61E+00	2,34E+02	1,65E+00	1,06E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,75E+00	1,85E+00	3,98E-02	-2,73E+01
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	2,22E+02	4,93E+00	6,61E+00	2,34E+02	1,65E+00	1,06E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,75E+00	1,85E+00	3,98E-02	-2,73E+01
SM	kg	2,19E+00	0,00E+00	7,72E-05	2,19E+00	0,00E+00	3,86E-06	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	1,59E-01	5,65E-04	1,14E-02	1,71E-01	1,89E-04	7,94E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,15E-04	8,26E-04	4,00E-05	-1,36E-02

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	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	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 were modeled as realistically as possible, prioritizing primary data from Walraven's production site. Where such data was unavailable, validated background datasets were used.

Data Collection
Module A1 is based on product composition data provided directly by the manufacturer. Module A2 incorporates actual transport distances and modes for incoming materials. Module A3 reflects measured energy consumption, production waste, and emissions from the 2023/2024 production year. Background data were sourced from the Dutch Nationale Milieudatabase v3.8, based on Ecoinvent 3.6.

Methodology and Reproducibility
The LCA complies with EN15804+A2:2019, ISO 14040, ISO 14044, ISO 14025, and NMD Bepalingsmethode v1.2 (2025). Modeling and calculations were performed using Ecochain Helix v4.3.1. Assessed life cycle stages include A1–A3 (raw material extraction, transport, manufacturing), A4–A5 (transport to site and installation), C1–C4 (end-of-life including demolition, transport, processing, and disposal), and D (reuse, recovery, and recycling potential).

Inventory and Allocation
All relevant materials, energy, emissions, and waste flows were included. Mass-based allocation was applied per EN15804 guidelines. No secondary materials were used, and cut-off criteria ensured that excluded flows per module did not exceed 5% of mass or energy.

Data Sources
Primary data from Walraven's Czech production site covered material types, quantities, energy use, transport distances, and emissions. Where supplier-specific data was missing, Ecoinvent 3.6 and NMD v3.8 datasets were used. Transport data included road and sea distances, with zinc coating transport typically 100 km. Environmental impacts were characterized using CML and EF 3.0 methods.

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 DIN 3567 (hdg) Type A 356. 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

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

REFERENCES

[1] ISO, ISO 14040: Environmental management – Life cycle assessment – Principles and Framework, ISO 14040:2006 + Amd 1:2020, International Organization for Standardization, 2020.

[2] ISO, ISO 14044: Environmental management – Life cycle assessment – Requirements and guidelines, ISO 14044:2006 + Amd 2:2020, International Organization for Standardization, 2020.

[3] ISO, ISO 14025: Environmental labels and declarations – Type III environmental declarations – Principles and procedures, ISO 14025:2006, International Organization for Standardization, 2006.

[4] European Technical Assessment (ETA) for Walraven Bifix® G2 Clamps, Walraven, Mijdrecht, 2024.

[5] NMD, Bepalingsmethode ‘Milieuprestatie Bouwwerken’ versie 1.2 inclusief de bijbehorende wijzigingsbladen, Nationale Milieudatabase, 2025.

[6] CE Delft, Handboek Schaduwprijzen, 2010. [Online]. Available: https://ce.nl/publicaties/handboek-schaduwprijzen-waardering-en-weging-van-emissies-en-milieueffecten/

[7] TNO, Toxiciteit heeft z'n prijs: schaduwprijzen voor (eco-)toxiciteit en uitputting van abiotische grondstoffen binnen DuboCalc. [Online]. Available: https://puc.overheid.nl/rijkswaterstaat/doc/PUC_119145_31/

[8] NEN, NEN-EN 15804: Duurzaamheid van bouwwerken – Milieuverklaringen van producten – Basisregels voor de productgroep bouwproducten, NEN-EN 15804:2012 + A2:2019 + AC:2021, Nederlands Normalisatie-instituut, 2021.

[9] P. P. Lahoti and V. D. M., Lubrication in cold rolling of steel, Journal of Materials Processing Technology, vol. 209, no. 9, pp. 4638–4642, 2009.

[10] F. G. H. van Wees, J. V. B., J. O. P. R., Energy Consumption for Steel Production, in World Energy Conference, Cannes, Nov. 1986.

[11] The Engineering Toolbox, 2001. [Online]. Available: https://www.engineeringtoolbox.com/

[12] NMD, Environmental Performance Assessment Method for Construction Works, January 2025. [Online]. Available: https://milieudatabase.nl/wp-content/uploads/2022/05/Bepalingsmethode_Milieuprestatie_Bouwwerken_maart_2022_Engels.pdf.