walraven

Environmental
Product
Declaration

According to ISO14025+EN15804 A2 (+indicators A1)

This declaration is for:
Walraven 3000 Clamp zinc plated M8 63mm

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

MRPI® registration:
1.1.00936.2025

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ECO PLATFORM EPD VERIFIED

MRPI milieu relevante product informatie

COMPANY INFORMATION

J. van Walraven Holding B.V.
Industrieweg 5
3641 RK
Mijdrecht
Netherlands
+31(0) 297 233000
Arunkumar Kuppusamy (info.nl@walraven.com)
https://www.walraven.com/int/

MRPI® REGISTRATION

1.1.00936.2025

DATE OF THIS ISSUE

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 3000 Clamp zinc plated M8 63mm

DECLARED UNIT / FUNCTIONAL UNIT

1 Piece

DESCRIPTION OF PRODUCT

The Walraven 3000 Clamp zinc plated M8 63mm is a durable two-screw clamp for fastening plastic pipes, featuring a ‘keyhole closing’ for easy installation and alignment. Its internal diameter is larger than the pipe to allow thermal expansion, while the profiled outer edges protect against damage. Made from zinc-plated steel for corrosion resistance, it can be used with a separate lining for rigid fixing applications.

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 3000 Clamp zinc plated M8 63 mm is a robust two-screw pipe clamp designed for secure fastening of plastic pipes in static installations. Featuring a keyhole closing design, it allows for easy pipe insertion and alignment during installation. The clamp's internal diameter is slightly larger than the pipe's outer diameter to accommodate thermal expansion and contraction, while its profiled outer edges help protect pipes from damage. Manufactured from durable steel with a zinc-plated finish, the clamp offers long-term corrosion resistance.

Manufacturing Location and Process
Production takes place in the Mijdrecht, Netherlands using precision steel-forming processes that adhere to environmental management standards. Steel coil processing ensures dimensional accuracy and strength, followed by stamping and bending to form parts that achieve a precise fit and maintain structural integrity. Threading and drilling provide secure fastening, while zinc plating supplies reliable corrosion protection in accordance with ISO 9227 salt spray testing. The final assembly integrates the two-screw fastening system, with optional lining available for fixed-point 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: 0573-pro & Elektriciteit, hernieuwbaar, uit PV, bij consument, per kWh, Database: Ecoinvent v3.6 (Cut-off, NMD), GWP : 0.095 kg CO2-eq /kWh

Environmental Performance
The product delivers strong environmental performance. Zinc coating reduces maintenance needs by preventing corrosion, steel components are fully recyclable at end of life, and production processes are designed to minimize energy use and material waste.

Installation and Use
During installation and use, the oversized internal diameter accommodates thermal movement without stressing the pipe, while the smooth external profile protects the pipe from damage. For rigid fixing points, the clamp can be adapted with a lining.

End-of-Life Considerations
At the end of its service life, the steel parts are easy to disassemble and entirely recyclable.

Packaging and Transport
The clamp is shipped in recyclable cardboard, and transport is optimized through consolidated shipments and the use of low-emission carriers where possible.

Name - Half parts	
Steel - Lower part	
Steel - Upper part	
Steel - Hollow pan head screw	
Steel - Nut	
Plastic - Nut holder	
Plastic - Anti-loss washer	

Total Weight	108 g

Component (> 1%)	(%)
Steel (combined)	96,96%

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 BIS 3000 Clamps, which confirms a minimum working life of 50 years under appropriate usage and maintenance conditions.

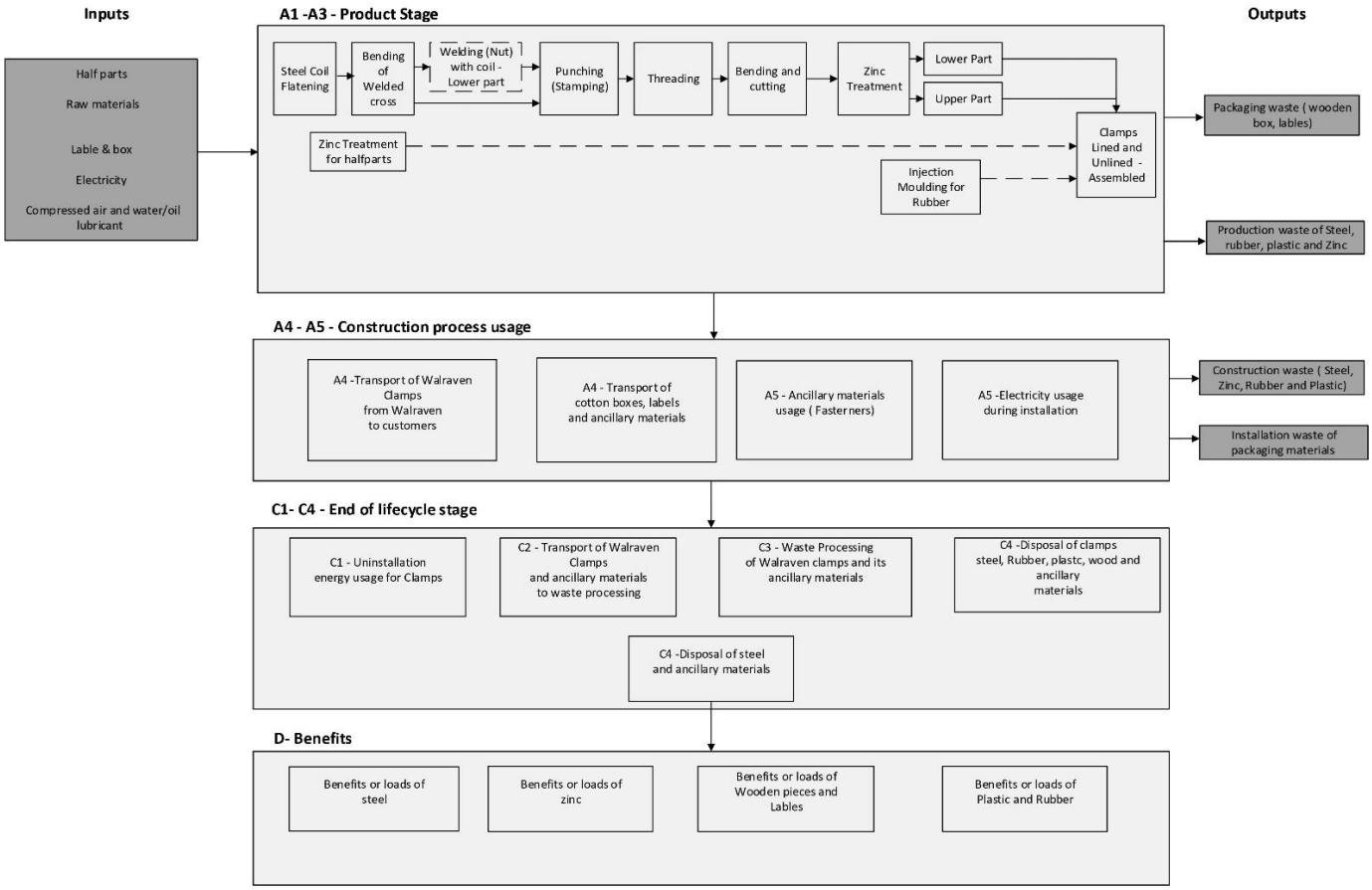
All significant inputs and outputs such as emissions, energy consumption, and material flows are accounted for. Materials representing less than 1% of the product's total weight may be excluded unless they are expected to contribute more than 5% to any environmental impact category. The cumulative environmental 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


Inputs
A1 -A3 - Product Stage
Outputs
Half parts
Raw materials
Lable & box
Electricity
Compressed air and water/oil lubricant
Steel Coil Flatening
Bending of Welded cross
Welding (Nut) with coil - Lower part
Punching (Stamping)
Threading
Bending and cutting
Zinc Treatment
Lower Part
Upper Part
Zinc Treatment for halfparts
Injection Moulding for Rubber
Clamps Lined and Unlined - Assembled
Packaging waste (wooden box, lables)
Production waste of Steel, rubber, plastic and Zinc
A4 - A5 - Construction process usage
A4 -Transport of Walraven Clamps from Walraven to customers
A4 - Transport of cotton boxes, labels and ancillary materials
A5 - Ancillary materials usage (Fasterners)
A5 -Electricity usage during installation
Construction waste (Steel, Zinc, Rubber and Plastic)
Installation waste of packaging materials
C1- C4 - End of lifecycle stage
C1 - Uninstallation energy usage for Clamps
C2 - Transport of Walraven Clamps and ancillary materials to waste processing
C3 - Waste Processing of Walraven clamps and its ancillary materials
C4 -Disposal of clamps steel, Rubber, plastc, wood and ancillary materials
C4 -Disposal of steel and ancillary materials
D- Benefits
Benefits or loads of steel
Benefits or loads of zinc
Benefits or loads of Wooden pieces and Lables
Benefits or loads of Plastic and Rubber

REPRESENTATIVENESS

The aggregation was done by choosing the reference product as Walraven 3000 Clamp zinc plated M8 63mm. The remaining products which are aggregated in the same group by following the 20% allocation and worst case senario as per the EN 15804+A2 & NMD Bepalingsmethode v1.2 (2025) are listed below:

Walraven 4000 Clamp M8 zinc plated 80mm
Walraven Bifix® G2 Clamp BUP M8/10 75-79mm
Walraven Double Wall Clamp pre-galvanized Pin 120 15mm
Walraven 4000 Clamp M8 BUP 75mm
Walraven 4000 Clamp M8 zinc plated 75mm
Walraven 3000 Clamp zinc plated M8 63mm
Walraven Duplo Double Pipe Clamp pre-galvanized 28mm
Walraven Double Wall Clamp pre-galvanized Pin 90 15mm
Walraven Duplo KSB1 zinc plated EPDM black 32-35mm
Walraven 4000 Clamp M8 BUP 70mm
Walraven 4000 Clamp M8 zinc plated 70mm
Walraven Duplo KSB1 zinc plated EPDM black 25-28mm
Walraven Bifix® G2 Clamp BUP M8/10 66-70mm
Walraven Duplo KSB1 zinc plated EPDM black 20-23mm
Walraven Duplo Double Pipe Clamp pre-galvanized 22mm
Walraven Duplo KSB1 zinc plated EPDM black 15-18mm
Walraven 4000 Clamp M8 BUP 63mm
Walraven 4000 Clamp M8 zinc plated 63mm
Walraven Sprinkler Clamp TA41 FM/UL M10 2" (DN50)
Walraven Bifix® G2 Clamp BUP M8/10 60-64mm
Walraven 4000 Clamp M8 zinc plated 56mm
Walraven 3000 Clamp zinc plated M8 50mm

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.	2,70E-03	1,99E-06	4,28E-07	2,70E-03	5,54E-08	1,27E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,23E-08	1,54E-07	2,80E-10	-1,66E-04
ADPF	MJ	5,24E+00	1,19E+00	4,29E-01	6,86E+00	3,31E-02	2,95E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,52E-02	3,75E-02	8,49E-04	-1,09E+00
GWP	kg CO2 eq.	3,56E-01	7,78E-02	2,34E-02	4,57E-01	2,17E-03	1,91E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,61E-03	2,74E-03	3,01E-05	-8,42E-02
ODP	kg CFC11 eq.	2,48E-08	1,38E-08	2,27E-09	4,08E-08	3,85E-10	1,95E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,41E-10	3,43E-10	9,98E-12	-3,20E-09
POCP	kg ethene eq.	3,54E-04	4,69E-05	2,07E-07	4,02E-04	1,31E-06	1,18E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,18E-06	2,42E-06	3,20E-08	-1,72E-04
AP	kg SO2 eq.	1,91E-03	3,42E-04	3,97E-05	2,30E-03	9,53E-06	1,02E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,59E-05	2,70E-05	2,19E-07	-3,14E-04
EP	kg (PO4) 3 eq.	2,75E-04	6,72E-05	7,09E-06	3,49E-04	1,87E-06	1,60E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,12E-06	3,44E-06	4,24E-08	-3,87E-05

Toxicity indicators and ECI (Dutch market)

HTP	kg DCB eq.	7,63E-01	3,27E-02	2,16E-03	7,98E-01	9,13E-04	3,75E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,52E-03	3,33E-03	1,40E-05	-5,37E-02
FAETP	kg DCB eq.	1,01E-02	9,56E-04	8,59E-05	1,11E-02	2,66E-05	5,73E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,44E-05	6,20E-05	5,89E-07	2,17E-04
MAETP	kg DCB eq.	1,95E+01	3,44E+00	3,41E-01	2,33E+01	9,59E-02	1,18E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,60E-01	2,70E-01	1,19E-03	-1,58E-01
TETP	kg DCB eq.	4,60E-03	1,16E-04	1,82E-04	4,90E-03	3,23E-06	4,47E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,38E-06	1,04E-05	3,52E-08	4,03E-03
ECI	euro	1,01E-01	9,37E-03	1,67E-03	1,12E-01	2,61E-04	5,11E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,35E-04	6,13E-04	4,29E-06	-1,09E-02
ADPF	kg Sb eq.	2,52E-03	5,72E-04	2,06E-04	3,30E-03	1,59E-05	1,42E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,66E-05	1,81E-05	4,08E-07	-5,25E-04

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.	3,67E-01	7,85E-02	-3,41E-03	4,42E-01	2,19E-03	1,81E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,65E-03	2,79E-03	3,07E-05	-8,97E-02
GWP-fossil	kg CO2 eq.	3,65E-01	7,84E-02	2,34E-02	4,67E-01	2,19E-03	1,93E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,64E-03	2,78E-03	3,06E-05	-8,98E-02
GWP-biogenic	kg CO2 eq.	1,35E-03	2,92E-05	-5,00E-07	1,38E-03	8,16E-07	7,25E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,36E-06	1,45E-03	1,86E-08	0,00E+00
GWP-luluc	kg CO2 eq.	6,23E-04	2,87E-05	-5,55E-07	6,51E-04	8,01E-07	3,48E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,34E-06	3,11E-06	8,54E-09	4,01E-05
ODP	kg CFC11 eq.	2,51E-08	1,73E-08	2,47E-09	4,48E-08	4,83E-10	2,20E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,04E-10	3,99E-10	1,26E-11	-2,53E-09
AP	mol H+ eq.	2,36E-03	4,55E-04	5,35E-05	2,87E-03	1,27E-05	1,28E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,11E-05	3,37E-05	2,90E-07	-3,85E-04
EP-fresh water	kg PO4 eq.	2,71E-05	7,91E-07	4,55E-07	2,84E-05	2,21E-08	1,25E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,68E-08	1,89E-07	3,45E-10	-3,68E-06
EP-marine	kg N eq.	4,97E-04	1,60E-04	1,09E-05	6,68E-04	4,47E-06	3,07E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,45E-06	7,42E-06	1,00E-07	-7,37E-05
EP-terrestrial	mol N eq.	5,47E-03	1,77E-03	1,65E-04	7,40E-03	4,93E-05	3,38E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,21E-05	8,62E-05	1,10E-06	-8,54E-04
POCP	kg NMVOC eq.	1,86E-03	5,04E-04	2,68E-05	2,39E-03	1,41E-05	9,67E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,34E-05	2,35E-05	3,20E-07	-5,13E-04
ADP-minerals & metals	kg Sb eq.	2,70E-03	1,99E-06	4,28E-07	2,70E-03	5,54E-08	1,27E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,23E-08	1,54E-07	2,80E-10	-1,66E-04
ADP-fossil	MJ, net calorific value	4,62E+00	1,18E+00	3,98E-01	6,20E+00	3,30E-02	2,83E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,50E-02	3,85E-02	8,55E-04	-6,78E-01
WDP	m3 world eq. Deprived	2,12E-01	4,23E-03	5,38E-03	2,21E-01	1,18E-04	9,98E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,97E-04	3,88E-04	3,73E-05	-2,27E-02

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	2,60E-08	7,04E-09	8,22E-11	3,32E-08	1,96E-10	1,45E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,27E-10	4,23E-10	5,64E-12	-5,07E-09
IRP	kBq U235 eq.	1,99E-02	4,95E-03	6,61E-04	2,55E-02	1,38E-04	1,34E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,30E-04	1,92E-04	3,53E-06	7,20E-04
ETP-fw	CTUe	3,42E+01	1,05E+00	2,13E-01	3,54E+01	2,94E-02	1,57E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,90E-02	1,66E-01	6,68E-04	-4,29E+00
HTP-c	CTUh	2,53E-09	3,42E-11	-1,12E-11	2,56E-09	9,54E-13	1,26E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,59E-12	4,04E-12	1,37E-14	-4,74E-11
HTP-nc	CTUh	3,96E-08	1,15E-09	1,58E-10	4,09E-08	3,22E-11	2,81E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,36E-11	1,92E-10	4,84E-13	1,51E-08
SQP	-	1,74E+00	1,03E+00	5,03E-01	3,27E+00	2,86E-02	1,63E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,77E-02	7,75E-02	1,80E-03	-1,77E-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	3,56E-04	3,00E-06	1,56E-06	3,60E-04	8,36E-08	1,65E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,39E-07	1,16E-07	1,27E-09	-3,14E-05
NHWD	kg	1,11E-01	7,50E-02	7,55E-04	1,86E-01	2,09E-03	9,49E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,49E-03	1,12E-03	5,74E-03	-9,09E-03
RWD	kg	1,61E-05	7,77E-06	6,30E-07	2,45E-05	2,17E-07	1,27E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,61E-07	2,28E-07	5,62E-09	-3,74E-09
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	1,51E-04	1,51E-04	0,00E+00	7,55E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	1,07E-01	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	5,31E-06	5,31E-06	0,00E+00	2,65E-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	3,36E-04	3,36E-04	0,00E+00	1,68E-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	1,96E-04	1,96E-04	0,00E+00	9,78E-06	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	4,86E-01	1,48E-02	1,58E-01	6,59E-01	4,13E-04	3,35E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,88E-04	6,04E-03	8,23E-06	4,19E-03
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	4,86E-01	1,48E-02	1,58E-01	6,59E-01	4,13E-04	3,35E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,88E-04	6,04E-03	8,23E-06	4,19E-03
PENRE	MJ	4,91E+00	1,26E+00	4,35E-01	6,60E+00	3,50E-02	3,02E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,83E-02	4,08E-02	9,09E-04	-7,06E-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	4,91E+00	1,26E+00	4,35E-01	6,60E+00	3,50E-02	3,02E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,83E-02	4,08E-02	9,09E-04	-7,06E-01
SM	kg	4,84E-02	0,00E+00	4,58E-05	4,84E-02	0,00E+00	2,29E-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	6,38E-03	1,44E-04	1,77E-04	6,70E-03	4,02E-06	3,11E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,69E-06	1,83E-05	9,19E-07	-5,04E-04

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

The modeling reflects real production practices at the Walraven Mijdrecht facility, using high-quality and up-to-date input data. Primary data sources consist of site-specific energy and materials administration for the years 2023 and 2024. Where supplier-specific information was not available, verified generic datasets from Ecoinvent v3.6 and the Nationale Milieudatabase (NMD) v3.8 were applied. All significant mass and energy flows are included, and no cut-off flows exceed 5%, ensuring compliance with EN 15804+A2.

Data Collection Period

The datasets represent production processes and upstream transport conditions for the calendar years 2023 and 2024.

Methodology and Reproducibility

The life cycle assessment follows the framework of EN 15804+A2:2019, ISO 14040/44, and ISO 14025. The declared functional unit is one piece of Walraven 3000 Clamp zinc plated M8 63 mm. The product system is modeled cradle-to-grave, covering Modules A1 - A3, A4 - C4, and D. All modeling and assumptions are fully documented, with references and metadata stored in a project dossier accessible through Ecochain, ensuring full reproducibility.

Inventory and Allocation

System boundaries are defined in accordance with EN 15804+A2 and follow a modular approach, covering raw materials, transport, production, and end-of-life. Energy and material inputs are allocated proportionally across production lines based on physical flows such as mass and energy consumption. Manufacturing processes at the Mijdrecht site include Dutch grid electricity supplemented by on-site solar generation, use of lubricants as auxiliary materials, and emissions and waste modeled from site-specific data. End-of-life scenarios (Modules C2–C4 and D) account for both burdens and benefits. Steel and zinc are modeled with 95% recycling and 5% landfill disposal, consistent with NMD datasets and EN 15804 guidance.

Data Sources

Primary data is derived directly from the Walraven Mijdrecht production site, including energy consumption, process inputs, and waste outputs. Secondary data is sourced from Ecoinvent v3.6 (cut-off system model) and the Nationale Milieudatabase v3.8 for material, energy, and transport processes. The main material inputs include DC01 hot-rolled steel, zinc coating, and hollow pan headed steel screws (Class 4.8). Transport assumptions reflect global sourcing with road freight distances up to 3,800 km and 50 km is assumed for waste processing transport.

Grouping and Benchmarking Relevance

The Walraven 3000 Clamp zinc plated M8 63 mm is considered a mid-size representative within the 3000 series and may serve as a reference product for grouping. This applies where similar products are within ±20% of the reference mass and environmental performance indicators, and where end-of-life and use-phase impacts remain consistent. In cases where larger products, such as 100 mm clamps, exceed the 20% threshold in any major impact category, a new worst-case scenario must be defined.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

Modules A1 to A3 represent the upstream and manufacturing phases of the product life cycle. Module A1 addresses the sourcing and production of raw materials, which include steel in various grades, PA6 polyamide plastic used for anti-loss washers and nut holders, and zinc coating. These materials are modeled using datasets from the National Milieudatabase (NMD) v3.8 and Ecoinvent v3.6. Where specific datasets were not available, generic references were applied. For steel components, the material composition is assumed to consist of 57% primary and 43% secondary content, reflecting NMD market averages.

Module A2 covers the transport of raw materials to the production facility in Mijdrecht. Transport distances vary per component. A secondary 100 km transport leg is applied to several materials. All transport is modeled in accordance with EN 15804+A2:2019/AC:2021, assuming a 50% load factor (a full trip to the site and an empty return). Emissions are based on the dataset “0001-tra&Transport, vrachtwagen (freight, lorry, unspecified {GLO})” from NMD v3.8 in combination with Ecoinvent v3.6.

Module A3 represents the manufacturing processes at the Walraven Mijdrecht site. These processes include electricity consumption from both the grid and solar photovoltaic systems, additional energy requirements for zinc coating, and the generation of production waste, primarily steel scrap, of which part is recycled. Lubricating oil is used as an auxiliary material. Waste and recycling quantities are calculated proportionally according to the clamp’s share of total factory output, and transport of waste to processing facilities is included in the modeling. In line with the cutoff rule in EN 15804+A2, capital goods are excluded, as their contribution to total environmental impact is below 5%.

Module A4 addresses the distribution of the finished clamp to installation sites. A standard distribution distance of 150 km is assumed, consistent with the Bepalingsmethode v1.2 (2025), with a 50% truck load factor applied. Emissions are modeled using the dataset “0001-tra&Transport, vrachtwagen” from NMD v3.8 and Ecoinvent v3.6.

Module A5 covers the installation phase. A 5% material loss is assumed due to handling inefficiencies. Installation itself is performed manually and does not involve additional energy consumption. Waste generated during installation is transported for processing, with steel waste assumed to travel 100 km to landfill and PA6 plastic transported 100 km to an AVI incineration facility with energy recovery.

Waste fractions are modeled in accordance with the assumptions in Bepalingsmethode v1.2 (2025).

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

Module C1 covers the deconstruction phase. In this case, deconstruction is carried out manually and therefore does not involve any energy use.

Module C2 accounts for transport to waste processing facilities. Steel and zinc components are transported 50 kilometers to landfill or recycling sites, while plastic (PA6) is transported 100 kilometers to an AVI incineration plant. The transport datasets applied are consistent with the reference “0001-tra&Transport, vrachtwagen” from the NMD v3.8 database in combination with Ecoinvent v3.6.

Module C3 includes the waste processing stage. Steel and zinc are assumed to be 100% sorted and recycled. Plastic (PA6) is modeled as 100% incinerated with energy recovery, using the reference “0264-avC&Verbranden kunststoffen (28.67 MJ/kg).” For steel, the processing dataset “0315-reC&Sorteren en persen oud ijzer” is used, while zinc is modeled on the basis of coating-related waste processing as defined in NMD v3.8.

Module C4 describes the final disposal stage. A residual fraction of 5% of both steel and zinc is assumed to be landfilled. The datasets applied are “0253-sto&Stort staal” for steel and “0248-sto&Stort koper, lood, verzinkt staal, zink” for zinc.

Module D quantifies the benefits and loads beyond the system boundary. Steel recycling results in a substitution benefit of 52%, based on a recycling rate of 95% minus the 43% already accounted for as secondary material. Zinc recycling is modeled with a 95% substitution benefit. For plastics, PA6 incineration is credited with 100% energy substitution.

This modeling approach complies with the requirements of EN 15804+A2:2019/AC:2021 and follows the structure and assumptions of Bepalingsmethode v1.2 (2025). All calculations are based on validated input from Walraven production records, with datasets sourced from NMD v3.8 and Ecoinvent v3.6.

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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