Environmental
Product
Declaration

According to ISO14025+EN15804 A2 (+indicators A1)

This declaration is for:
Walraven Nail-in Clamp pre-galvanized KA P80 DN50

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

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MRPI® REGISTRATION

1.1.00959.2025

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15-5-2025

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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 Nail-in Clamp pre-galvanized KA P80 DN50

DECLARED UNIT / FUNCTIONAL UNIT

1 Piece

DESCRIPTION OF PRODUCT

Walraven Nail-in Clamp KA P80 DN50 is a robust two-screw steel clamp with a quick locking system, designed for secure pipe fastening. Pre-galvanized for corrosion resistance and mounted on a hammer-in stud, it ensures fast and reliable installation.

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 Nail-in Clamp KA P80 DN50 is a robust two-screw steel clamp with a quick locking system, designed for secure pipe fastening. It is pre-galvanized for corrosion resistance and mounted on a hammer-in nail for fast installation.

Manufacturing Location
Produced at Walraven's certified facility in the Horka, Czech Republic, operating under environmental management standards.

Manufacturing Process Overview
Clamp bodies are formed from steel. The clamp includes a pre-mounted hammer-in stud system with integrated locking. The surface is treated with a zinc plating that meets ISO 9227 salt spray test requirements. All units are supplied fully assembled and ready for immediate installation.

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
The pre-galvanized coating ensures corrosion resistance in dry, indoor environments. The clamp is made from recyclable steel and zinc, with production complying with EN 15804 + A2:2019 and using Ecoinvent v3.6 for environmental modeling. No hazardous waste is generated during production, and the design supports material efficiency and long service life.

Installation and Use Phase
The nail-in system allows tool-free, fast mounting, while the two-screw design provides secure and stable pipe support. The clamp is intended for indoor applications where vibration isolation is not required. 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 disassembled manually for efficient material recovery. Steel and zinc components are fully recyclable, and recycling contributes to reducing the impact of virgin material production.

Packaging and Transport
The product is packaged in recyclable cardboard boxes optimized for transport. Shipping is modeled using 16–32-ton EURO 5/6 trucks.

Compliance and Certifications
Surface protection has been validated according to ISO 9227. The product conforms to EN 15804 + A2 and ISO 14025 standards.

Reference Service Life
The clamp is designed to last up to 50 years in dry, protected indoor conditions.

Name - Half parts	
Steel - Lower part	
Steel - Upper part	
Steel - Hollow pan head screw	

Total Weight	86 g

Component (> 1%)	(%)
Steel (combined)	97,09%

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.

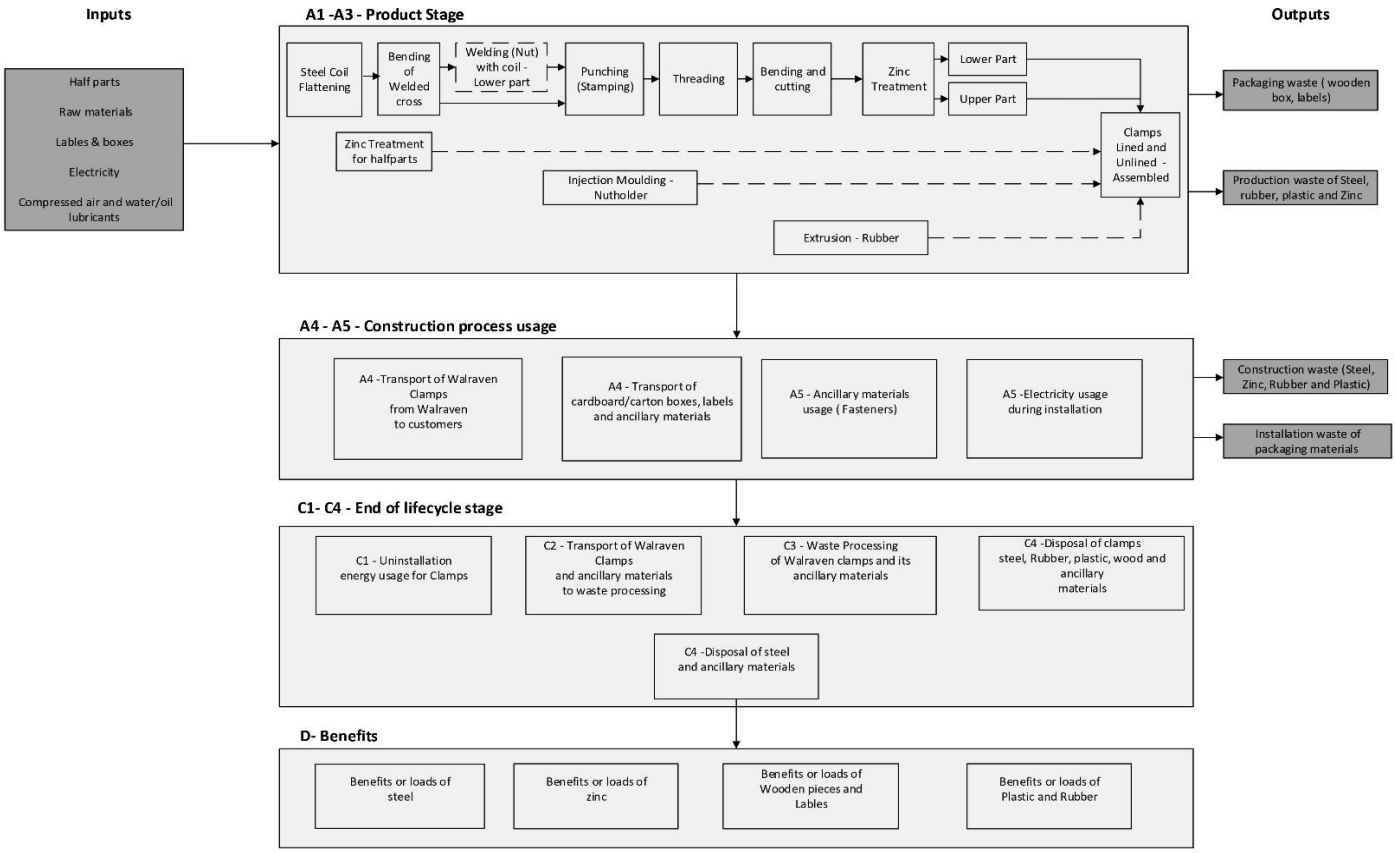
All significant inputs and outputs such as emissions, energy consumption, and material flows are accounted for. Materials representing less than 1% of the product's total weight may be excluded unless they are expected to contribute more than 5% to any environmental impact category. The cumulative environmental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


Inputs
A1 -A3 - Product Stage
Outputs
Half parts
Raw materials
Lables & boxes
Electricity
Compressed air and water/oil lubricants
Steel Coil Flattening
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 - Nutholder
Extrusion - Rubber
Clamps Lined and Unlined - Assembled
Packaging waste (wooden box, labels)
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 cardboard/carton boxes, labels and ancillary materials
A5 - Ancillary materials usage (Fasteners)
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, plastic, 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 Nail-in Clamp pre-galvanized KA P80 DN50. The remaining products which are aggregated in the same group by following the 20% allocation and worst case scenario as per the EN 15804+A2 & NMD Bepalingsmethode v1.2 (2025) are listed below:

Walraven 2S Clamp zinc plated M8/10 104-112mm
Walraven Two-Screw Clamp Stainless M8/10 51-55mm
Walraven Pipe Clamp double EPDM Screw 8x80 + Plug 25-29mm
Walraven Spiral Duct Clamp Aluminium M8 200mm
Walraven Nail-in Clamp pre-galvanized KA P80 DN40
Walraven Nail-in Clamp pre-galvanized KA P80 DN50
Walraven Two-Screw Clamp Stainless M8/10 47-50mm
Walraven Industrial Saddle hot dip galvanized 42.4mm 1 1/4"
Walraven 2S Clamp zinc plated M8/10 96-103mm
Walraven Pipe Clamp double EPDM Screw 8x80 + Plug 32-36mm
Walraven Spiral Duct Clamp Aluminium M8 180mm
Walraven Bifix® 415 Clamp Stainless M8 50mm
Walraven Pipe Clamp double EPDM Screw 8x80 + Plug 20-24mm
Walraven Two-Screw Clamp Stainless M8/10 36-42mm
Walraven 2S Clamp zinc plated M8/10 88-95mm
Walraven HD500 Clamp BUP M10 31-36mm
Walraven Industrial Saddle hot dip galvanized 33.7mm 1"
Walraven Two-Screw Clamp Stainless M8/10 32-36mm
Walraven Spiral Duct Clamp Aluminium M8 150mm
Walraven Bifix® 300 Clamp Stainless M10 79-85mm
Walraven Pipe Clamp double EPDM Screw 8x80 + Plug 15-18mm
Walraven Industrial Saddle hot dip galvanized 26.9mm 3/4"
Walraven Bifix® 415 Clamp Stainless M8 40mm
Walraven Spiral Duct Clamp Aluminium M8 130mm
Walraven Two-Screw Clamp Stainless M8/10 26-30mm
Walraven 4000 Clamp M8 BUP 32mm
Walraven Pipe Saddle hot dip galvanized 60.3mm 2"
Walraven HD500 Clamp BUP M10 25-30mm
Walraven Bifix® 300 Clamp Stainless M8 47-51mm
Walraven Spiral Duct Clamp Aluminium M8 110mm
Walraven Spiral Duct Clamp Aluminium M8 100mm
Walraven Bifix® 415 Clamp Stainless M8 32mm
Walraven Two-Screw Clamp Stainless M8/10 20-24mm
Walraven Pipe Saddle hot dip galvanized 48.0mm 1 1/2"
Walraven Nail-in Clamp pre-galvanized ST P80 1"
Walraven Spiral Duct Clamp Aluminium M8 90mm
Walraven 4000 Clamp M8 zinc plated 32mm
Walraven Pipe Saddle hot dip galvanized 42.5mm 1 1/4"
Walraven Two-Screw Clamp Stainless M8/10 15-18mm
Walraven Spiral Duct Clamp Aluminium M8 80mm
Walraven Bifix® 300 Clamp Stainless M8 40-43mm

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.	3,37E-03	3,59E-07	4,33E-06	3,38E-03	4,41E-08	1,69E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,35E-08	2,44E-07	2,27E-10	-4,71E-08
ADPF	MJ	5,04E+00	2,15E-01	5,67E+00	1,09E+01	2,64E-02	5,11E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,40E-02	5,94E-02	6,88E-04	-8,34E-01
GWP	kg CO2 eq.	3,44E-01	1,40E-02	4,21E-01	7,79E-01	1,73E-03	3,62E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,88E-03	4,34E-03	2,43E-05	-6,50E-02
ODP	kg CFC11 eq.	2,46E-08	2,49E-09	2,37E-08	5,08E-08	3,06E-10	2,50E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,10E-10	5,43E-10	8,10E-12	-2,26E-09
POCP	kg ethene eq.	3,14E-04	8,48E-06	-1,21E-04	2,02E-04	1,04E-06	3,35E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,74E-06	3,83E-06	2,59E-08	-1,41E-04
AP	kg SO2 eq.	1,96E-03	6,18E-05	1,42E-03	3,45E-03	7,59E-06	1,64E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,27E-05	4,27E-05	1,78E-07	-2,20E-04
EP	kg (PO4) 3 eq.	2,83E-04	1,21E-05	3,03E-04	5,98E-04	1,49E-06	2,91E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,49E-06	5,45E-06	3,43E-08	-2,61E-05

Toxicity indicators and ECI (Dutch market)

HTP	kg DCB eq.	6,72E-01	5,91E-03	-1,65E-02	6,62E-01	7,27E-04	3,14E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,21E-03	5,27E-03	1,10E-05	-4,06E-02
FAETP	kg DCB eq.	1,12E-02	1,73E-04	2,02E-03	1,33E-02	2,12E-05	7,00E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,54E-05	9,81E-05	2,61E-07	5,04E-04
MAETP	kg DCB eq.	2,09E+01	6,21E-01	1,03E+01	3,17E+01	7,63E-02	1,64E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,27E-01	4,27E-01	9,32E-04	4,21E-01
TETP	kg DCB eq.	4,12E-03	2,09E-05	2,03E-03	6,18E-03	2,57E-06	4,80E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,28E-06	1,64E-05	2,76E-08	3,40E-03
ECI	euro	9,23E-02	1,69E-03	2,94E-02	1,23E-01	2,08E-04	5,84E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,47E-04	9,70E-04	3,43E-06	-8,11E-03
ADPF	kg Sb eq.	2,43E-03	1,03E-04	2,73E-03	5,26E-03	1,27E-05	2,46E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,12E-05	2,86E-05	3,31E-07	-4,01E-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.	3,54E-01	1,42E-02	4,18E-01	7,86E-01	1,74E-03	3,63E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,90E-03	2,07E-03	2,48E-05	-6,96E-02
GWP-fossil	kg CO2 eq.	3,52E-01	1,42E-02	4,17E-01	7,83E-01	1,74E-03	3,61E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,90E-03	4,39E-03	2,48E-05	-6,97E-02
GWP-biogenic	kg CO2 eq.	1,53E-03	5,28E-06	6,73E-04	2,21E-03	6,49E-07	1,16E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,08E-06	-2,33E-03	1,45E-08	0,00E+00
GWP-luluc	kg CO2 eq.	7,22E-04	5,19E-06	4,35E-04	1,16E-03	6,38E-07	6,10E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,06E-06	4,92E-06	6,91E-09	5,15E-05
ODP	kg CFC11 eq.	2,49E-08	3,13E-09	1,85E-08	4,66E-08	3,84E-10	2,33E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,40E-10	6,31E-10	1,02E-11	-1,70E-09
AP	mol H+ eq.	2,42E-03	8,22E-05	1,70E-03	4,20E-03	1,01E-05	2,01E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,68E-05	5,33E-05	2,35E-07	-2,69E-04
EP-fresh water	kg PO4 eq.	2,80E-05	1,43E-07	7,01E-05	9,82E-05	1,76E-08	4,81E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,93E-08	2,99E-07	2,78E-10	-2,46E-06
EP-marine	kg N eq.	5,12E-04	2,90E-05	2,39E-04	7,80E-04	3,56E-06	3,76E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,93E-06	1,17E-05	8,09E-08	-4,99E-05
EP-terrestrial	mol N eq.	5,66E-03	3,19E-04	2,91E-03	8,89E-03	3,92E-05	4,28E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,54E-05	1,36E-04	8,92E-07	-5,82E-04
POCP	kg NMVOC eq.	1,82E-03	9,11E-05	3,78E-04	2,29E-03	1,12E-05	9,81E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,87E-05	3,72E-05	2,59E-07	-3,96E-04
ADP-minerals & metals	kg Sb eq.	3,37E-03	3,59E-07	4,33E-06	3,38E-03	4,41E-08	1,69E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,35E-08	2,44E-07	2,27E-10	-4,71E-08
ADP-fossil	MJ, net calorific value	4,56E+00	2,14E-01	6,13E+00	1,09E+01	2,63E-02	5,28E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,38E-02	6,09E-02	6,93E-04	-4,87E-01
WDP	m3 world eq. Deprived	2,23E-01	7,64E-04	9,11E-02	3,15E-01	9,39E-05	1,51E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,57E-04	6,13E-04	3,10E-05	-1,33E-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	2,35E-08	1,27E-09	-6,73E-09	1,80E-08	1,56E-10	7,54E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,61E-10	6,69E-10	4,56E-12	-4,03E-09
IRP	kBq U235 eq.	2,18E-02	8,95E-04	3,45E-02	5,73E-02	1,10E-04	2,95E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,83E-04	3,03E-04	2,84E-06	1,19E-03
ETP-fw	CTUe	3,86E+01	1,91E-01	3,17E-01	3,91E+01	2,34E-02	1,85E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,90E-02	2,62E-01	4,49E-04	-2,34E+00
HTP-c	CTUh	2,36E-09	6,18E-12	-5,83E-10	1,79E-09	7,60E-13	8,92E-11	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,27E-12	6,39E-12	1,04E-14	-8,91E-12
HTP-nc	CTUh	4,04E-08	2,08E-10	1,62E-10	4,08E-08	2,56E-11	2,73E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,27E-11	3,03E-10	3,19E-13	1,35E-08
SQP	-	1,80E+00	1,85E-01	1,67E+00	3,66E+00	2,28E-02	1,87E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,80E-02	1,23E-01	1,45E-03	-1,08E-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	4,40E-04	5,41E-07	-7,74E-06	4,33E-04	6,65E-08	2,12E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,11E-07	1,84E-07	1,03E-09	-8,36E-06
NHWD	kg	9,93E-02	1,36E-02	3,37E-02	1,47E-01	1,67E-03	7,53E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,78E-03	1,78E-03	4,70E-03	-6,82E-03
RWD	kg	1,73E-05	1,40E-06	2,89E-05	4,76E-05	1,72E-07	2,44E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,87E-07	3,61E-07	4,55E-09	4,12E-07
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	8,94E-02	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	5,04E-01	2,68E-03	6,87E-01	1,19E+00	3,29E-04	6,09E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,48E-04	9,56E-03	5,60E-06	1,41E-02
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	5,04E-01	2,68E-03	6,87E-01	1,19E+00	3,29E-04	6,09E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,48E-04	9,56E-03	5,60E-06	1,41E-02
PENRE	MJ	4,85E+00	2,27E-01	6,61E+00	1,17E+01	2,79E-02	5,66E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,65E-02	6,46E-02	7,36E-04	-5,05E-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	4,85E+00	2,27E-01	6,61E+00	1,17E+01	2,79E-02	5,66E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,65E-02	6,46E-02	7,36E-04	-5,05E-01
SM	kg	4,05E-02	0,00E+00	7,72E-05	4,05E-02	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	6,75E-03	2,60E-05	1,14E-02	1,82E-02	3,20E-06	8,97E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,33E-06	2,89E-05	7,40E-07	-2,52E-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

Data flows have been modeled as realistically as possible. Primary data from Walraven's Czech Republic production facility was prioritized, and where unavailable, verified reference data from appropriate databases was used. For Module A1, product composition data was obtained directly from the manufacturer. Module A2 incorporates actual transport distances and modes for incoming raw materials. Module A3 reflects site-specific energy consumption, waste generation, and emissions from the 2023/2024 production year. All background processes were sourced from the Nationale Milieudatabase v3.8, based on Ecoinvent 3.6.

Data Collection Period

The dataset represents the production processes used in 2023/2024.

Methodology and Reproducibility

The LCA was conducted in accordance with EN15804+A2:2019, ISO 14040, ISO 14044, ISO 14025, and the Dutch NMD Bepalingsmethode v1.2 (2025). Calculations were performed using Ecochain Helix v4.3.1. The study covers the following life cycle stages: A1–A3 (raw material supply, transport, manufacturing), A4–A5 (distribution and installation), C1–C4 (end-of-life processing and disposal), and D (reuse, recovery, and recycling potential).

Inventory and Allocation

All relevant materials, energy flows, emissions, and packaging were included. Allocation followed EN15804 guidelines using mass-based allocation at the production site. No secondary materials were used in production. Cut-off criteria ensured that excluded flows per module did not exceed 5% of mass or energy.

Data Sources

Primary data was collected from Walraven's production site, including material composition, energy use, and transport logistics. In cases where data was incomplete, representative datasets for steel, Class 4.8 screws, and zinc were drawn from Ecoinvent 3.6 and Nationale Milieudatabase v3.8. Transport data includes distances to the production site and to zinc treatment facilities.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

Modules A1 to A3 represent the production phase of the life cycle.
Module A1 covers the sourcing and processing of raw materials used to manufacture the Walraven Nail-in Clamp pre-galvanized KA P80 DN50. Based on the 2023/2024 production data from Walraven Czech Republic, the product consists primarily of steel components (upper and lower parts and screws) and a zinc coating. Life cycle modeling is conducted using datasets from Nationale Milieudatabase (NMD) v3.8 and Ecoinvent v3.6. Generic references were used where specific data were not available. For steel, an average composition of 57% primary and 43% secondary content was assumed, reflecting standard European market conditions.

Module A2 models the transportation of raw materials to the production site in the Czech Republic. All relevant transport flows are included and were calculated in accordance with EN 15804+A2, using a standard 50% truck load factor.

Module A3 evaluates manufacturing activities at the Walraven Czech facility. This includes electricity usage (both national grid and renewable sources), packaging materials, lubricating oil, and other auxiliary inputs. Primary operational data for 2023/2024 were used. Steel production waste and internal recycling are accounted for based on actual site shares. Environmental emissions and avoided burdens from recycling are also included. Capital goods were excluded from this module, as their environmental contribution was below the 5% threshold, in line with EN 15804+A2 cutoff rules.

Module A4 models the outbound distribution of the finished clamp to the construction site. A standard average transport distance of 150 km is used following Bepalingsmethode v1.2 guidance. A load factor of 50% is applied. Emissions were modeled using truck transport datasets from NMD v3.8 / Ecoinvent v3.6.

Module A5 addresses installation losses and packaging waste. A standard 5% loss due to manual handling at the installation site was applied to all material components (steel, zinc). These materials were then modeled for transportation to appropriate disposal or processing facilities: 100 km for both recycling (steel) and incineration (plastic/rubber, if present). No energy is used during installation as it is entirely manual.

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%

End-of-Life Scenario – Modules C1 to C4
At the end of the product's life, Module C1 assumes that the Walraven Hinged Pipe Clamp is manually uninstalled without any energy input. Module C2 models the transport of waste to treatment facilities, with steel and zinc traveling 50 km to either recycling centers or landfill sites, while any plastic or rubber components are transported 100 km to incineration facilities equipped with energy recovery (AVI).

Module C3 addresses waste processing. Steel and zinc components are assumed to be 100% recycled, while any plastics or rubber are fully incinerated to recover energy. Module C4 models final disposal, assuming that 5% of steel and zinc are sent to landfill, whereas rubber and plastic are fully incinerated without any landfill allocation. These end-of-life processes reflect standard practices and are modeled in accordance with validated datasets to ensure accurate environmental assessment.

Module D – Benefits and Loads Beyond the System Boundary
Module D captures the environmental credits associated with material recovery beyond the product's system boundary. For steel, the credit is calculated based on a 95% recycling rate and 43% secondary content in the input material, resulting in a substitution efficiency of 52%. Zinc benefits are modeled using a 95% recycling efficiency. Plastics and rubber, if present, are assumed to provide 100% energy substitution when incinerated at energy recovery facilities.

This modeling framework adheres to EN 15804+A2:2019 + AC:2021 and the Dutch Bepalingsmethode v1.2 (2025), employing a modular life cycle approach that ensures a comprehensive assessment of the product's environmental performance across all life cycle stages.

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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