Environmental Product Declaration

According to ISO14025+EN15804 A2 (+indicators A1)

This declaration is for:

Walraven Nail-in Clamp pre-galvanized KA P100 DN100

Provided by:

J. van Walraven Holding B.V.

MRPI® registration:

1.1.00960.2025

Program operator:

Stichting MRPI®

Publisher:

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MRPI® REGISTRATION

1.1.00960.2025

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.

PRODUCT

Walraven Nail-in Clamp pre-galvanized KA P100 DN100

DECLARED UNIT / FUNCTIONAL UNIT

1 Piece

DESCRIPTION OF PRODUCT

Two-screw clamp on hammer-in stud with quick locking system. Made of steel and zinc plated for corrosion resistance.

VISUAL PRODUCT

PROGRAM OPERATOR

Stichting MRPI®
Kingsfordweg 151
1043 GR
Amsterdam

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 P100 DN100 is a robust, two-screw pipe clamp with a quick-locking mechanism. It is pre-galvanized for corrosion protection and includes a hammer-in nail for rapid, secure installation.

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

Manufacturing Process Overview
The clamp body is stamped from steel, with pre-installed Class 4.8 hollow pan-headed screws. The surface is zinc-coated according to ISO 9227 standards for corrosion resistance. The product is supplied fully pre-assembled, including the integrated hammer-in stud for tool-free mounting.

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 clamp's zinc coating ensures durability in dry or semi-humid indoor environments. Approximately 50.2% of the steel content is recycled, and the product is free from Substances of Very High Concern (SVHC). VOC emissions are negligible. The LCA models cradle-to-grave impacts (A1–A5, B1, C1–C4, D) using Ecochain Helix v4.3.1 and background data from Ecoinvent v3.6.

Installation and Use
The nail-in system allows for fast mounting into masonry or concrete. It is suitable for indoor cable trays, conduits, or lightweight mechanical supports, intended for non-noise-sensitive applications. 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 is manually separable for material recovery. Over 95% of components, primarily steel, are recyclable. Module D benefits account for reuse and recycling credits, reducing net environmental impacts.

Packaging and Transport
Packaged in compact, stackable cardboard boxes. Transport is modeled via 16–32-ton Euro 5/6 trucks at 50% load capacity.

Compliance and Certifications
Corrosion resistance verified per ISO 9227. The environmental performance follows EN 15804+A2 and ISO 14025 standards.

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

Total Weight	**131 g**

Component (> 1%)	**(%)**
Steel (combined)	97,01%

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.

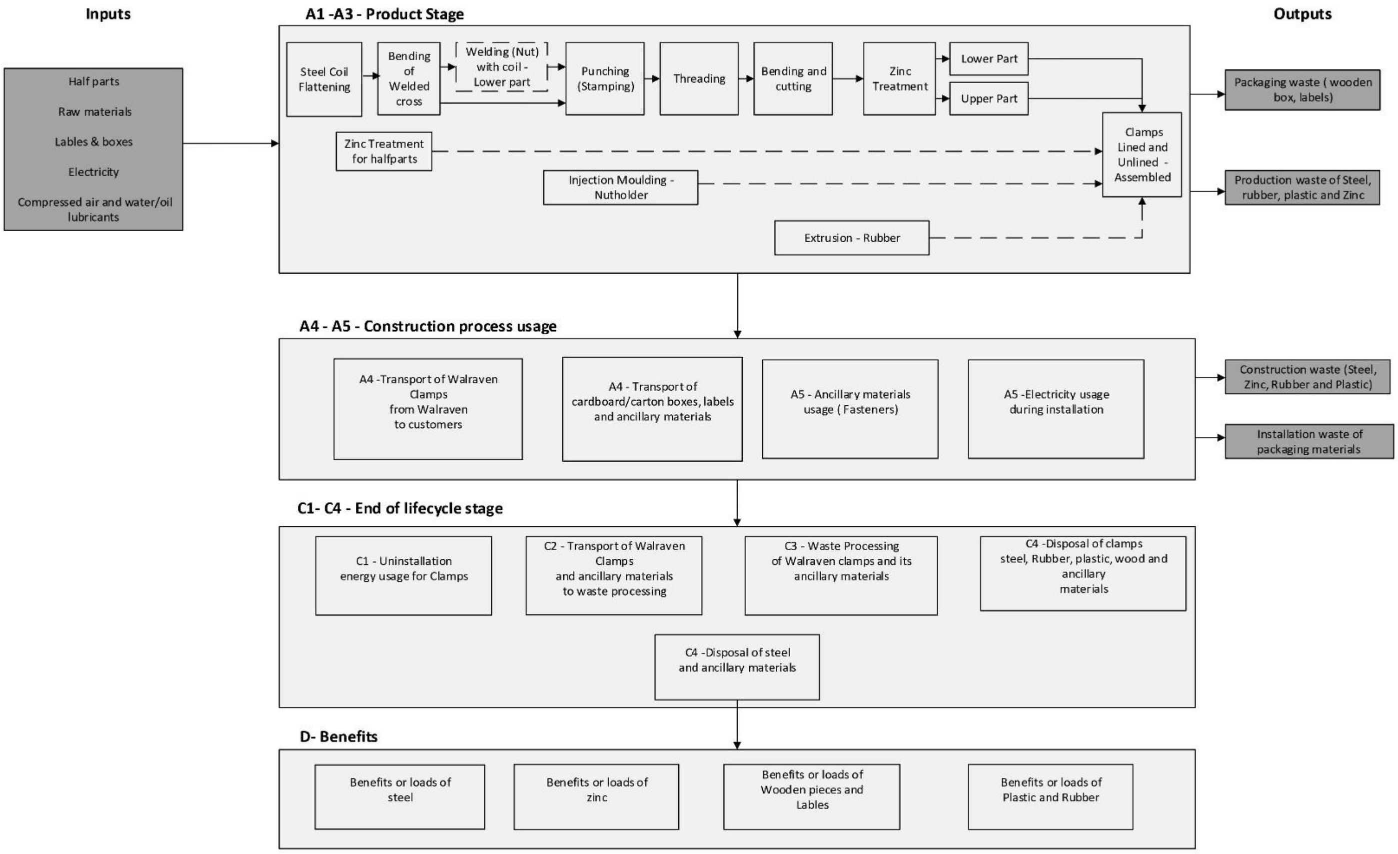
All significant inputs and outputs such as emissions, energy consumption, and material flows are accounted for. Materials representing less than 1% of the product's total weight may be excluded unless they are expected to contribute more than 5% to any environmental impact category. The cumulative environmental 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
Clamps Lined and Unlined - Assembled
Zinc Treatment for halfparts
Injection Moulding - Nutholder
Extrusion - Rubber
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 P100 DN100. 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 M8/10 154-162mm
Walraven 434 Clamp zinc plated M10 PE-pipe 50mm
Walraven HD500 Clamp BUP 1/2" 25-30mm
Walraven 434 Clamp zinc plated G1/2" PE-Pipe 40mm
Walraven Two-Screw Clamp Stainless M8/10 99-105mm
Walraven Hinged Pipe Clamp 400 round BUP 100mm
Walraven Nail-in Clamp pre-galvanized KA P100 DN100
Walraven 2S Clamp set zinc plated M8/10 113-118mm
Walraven 434 Clamp zinc plated M10 PE-pipe 40mm
Walraven Bifix® 415 Clamp Stainless M8 125mm
Walraven 2S Clamp zinc plated M8/10 145-153mm
Walraven HD500 Clamp BUP M8/10 25-30mm
Walraven Bifix® 412 Clamp pre-galvanized M8 100mm
Walraven Bifix® 300 Clamp Stainless M10 164-169mm
Walraven Two-Screw Clamp Stainless M8/10 87-92mm
Walraven 2S Clamp set zinc plated M8/10 104-112mm
Walraven HD500 Clamp BUP 1/2" 19-23mm
Walraven Bifix® 300 Clamp Stainless M10 85-89mm
Walraven 2S Clamp zinc plated M8/10 138-144mm
Walraven Industrial Saddle hot dip galvanized 60,3mm 2"
Walraven Bifix® 415 Clamp Stainless M8 110mm
Walraven 2S Clamp zinc plated M8/10 128-137mm
Walraven Hinged Pipe Clamp 400 round BUP 80mm
Walraven Bifix® 300 Clamp Stainless M8 85-89mm
Walraven Two-Screw Clamp Stainless M8/10 75-80mm
Walraven HD500 Clamp BUP 1/2" 15-19mm
Walraven Bifix® 415 Clamp Stainless M8 100mm
Walraven HD500 Clamp BUP M8/10 19-23mm
Walraven 2S Clamp zinc plated M8/10 119-127mm
Walraven Two-Screw Clamp Stainless M8/10 67-73mm
Walraven Bifix® 412 Clamp pre-galvanized M8 80mm
Walraven Bifix® 415 Clamp Stainless M8 90mm
Walraven 2S Clamp zinc plated M8/10 113-118mm
Walraven Bifix® 300 Clamp Stainless M8 72-76mm
Walraven 2S Clamp set zinc plated M8/10 88-95mm
Walraven Two-Screw Clamp Stainless M8/10 60-64mm
Walraven Industrial Saddle hot dip galvanized 48.3mm 1 1/2"
Walraven Nail-in Clamp pre-galvanized KA P100 DN70
Walraven Bifix® 300 Clamp Stainless M10 72-76mm
Walraven Bifix® 415 Clamp Stainless M8 80mm
Walraven Bifix® 415 Clamp Stainless M8 75mm

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.	5,13E-03	4,30E-07	4,33E-06	5,13E-03	6,72E-08	2,57E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,12E-07	3,71E-07	3,33E-10	-6,91E-08
ADPF	MJ	7,44E+00	2,57E-01	5,67E+00	1,34E+01	4,02E-02	6,17E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,70E-02	9,04E-02	1,01E-03	-1,22E+00
GWP	kg CO2 eq.	5,06E-01	1,68E-02	4,21E-01	9,44E-01	2,63E-03	4,31E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,38E-03	6,61E-03	3,57E-05	-9,54E-02
ODP	kg CFC11 eq.	3,58E-08	2,99E-09	2,37E-08	6,25E-08	4,67E-10	3,06E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,78E-10	8,27E-10	1,19E-11	-3,32E-09
POCP	kg ethene eq.	4,65E-04	1,02E-05	-1,21E-04	3,54E-04	1,59E-06	7,83E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,64E-06	5,83E-06	3,80E-08	-2,07E-04
AP	kg SO2 eq.	2,92E-03	7,40E-05	1,42E-03	4,42E-03	1,16E-05	2,09E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,93E-05	6,50E-05	2,61E-07	-3,23E-04
EP	kg (PO4) 3 eq.	4,20E-04	1,45E-05	3,03E-04	7,37E-04	2,27E-06	3,57E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,79E-06	8,29E-06	5,03E-08	-3,83E-05

Toxicity indicators and ECI (Dutch market)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HTP	kg DCB eq.	9,93E-01	7,08E-03	-1,65E-02	9,84E-01	1,11E-03	4,68E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,85E-03	8,02E-03	1,61E-05	-5,96E-02
FAETP	kg DCB eq.	1,65E-02	2,07E-04	2,02E-03	1,88E-02	3,23E-05	9,87E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,39E-05	1,49E-04	3,83E-07	7,39E-04
MAETP	kg DCB eq.	3,13E+01	7,44E-01	1,03E+01	4,23E+01	1,16E-01	2,19E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,94E-01	6,49E-01	1,37E-03	6,18E-01
TETP	kg DCB eq.	5,93E-03	2,50E-05	2,03E-03	7,99E-03	3,91E-06	6,50E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,52E-06	2,50E-05	4,05E-08	4,98E-03
ECI	euro	1,36E-01	2,03E-03	2,94E-02	1,68E-01	3,17E-04	7,92E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,28E-04	1,48E-03	5,04E-06	-1,19E-02
ADPF	kg Sb eq.	3,58E-03	1,24E-04	2,73E-03	6,43E-03	1,93E-05	2,97E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,22E-05	4,35E-05	4,86E-07	-5,89E-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.	5,22E-01	1,70E-02	4,18E-01	9,57E-01	2,65E-03	4,34E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,42E-03	3,58E-03	3,64E-05	-1,02E-01
GWP-fossil	kg CO2 eq.	5,18E-01	1,70E-02	4,17E-01	9,52E-01	2,65E-03	4,32E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,42E-03	6,69E-03	3,63E-05	-1,02E-01
GWP-biogenic	kg CO2 eq.	2,27E-03	6,33E-06	6,73E-04	2,95E-03	9,89E-07	1,56E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,65E-06	-3,11E-03	2,12E-08	0,00E+00
GWP-luluc	kg CO2 eq.	9,98E-04	6,22E-06	4,35E-04	1,44E-03	9,72E-07	7,63E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,62E-06	7,49E-06	1,01E-08	7,55E-05
ODP	kg CFC11 eq.	3,63E-08	3,75E-09	1,85E-08	5,86E-08	5,85E-10	2,93E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,76E-10	9,61E-10	1,50E-11	-2,50E-09
AP	mol H+ eq.	3,60E-03	9,84E-05	1,70E-03	5,40E-03	1,54E-05	2,56E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,56E-05	8,11E-05	3,45E-07	-3,95E-04
EP-fresh water	kg PO4 eq.	4,11E-05	1,71E-07	7,01E-05	1,11E-04	2,68E-08	5,42E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,46E-08	4,56E-07	4,07E-10	-3,61E-06
EP-marine	kg N eq.	7,65E-04	3,47E-05	2,39E-04	1,04E-03	5,42E-06	4,99E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,03E-06	1,79E-05	1,19E-07	-7,32E-05
EP-terrestrial	mol N eq.	8,47E-03	3,82E-04	2,91E-03	1,18E-02	5,98E-05	5,64E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,96E-05	2,08E-04	1,31E-06	-8,54E-04
POCP	kg NMVOC eq.	2,72E-03	1,09E-04	3,78E-04	3,21E-03	1,71E-05	1,37E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,84E-05	5,67E-05	3,80E-07	-5,81E-04
ADP-minerals & metals	kg Sb eq.	5,13E-03	4,30E-07	4,33E-06	5,13E-03	6,72E-08	2,57E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,12E-07	3,71E-07	3,33E-10	-6,91E-08
ADP-fossil	MJ, net calorific value	6,70E+00	2,56E-01	6,13E+00	1,31E+01	4,00E-02	6,29E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,67E-02	9,27E-02	1,02E-03	-7,14E-01
WDP	m3 world eq. Deprived	3,33E-01	9,15E-04	9,11E-02	4,25E-01	1,43E-04	2,04E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,38E-04	9,33E-04	4,55E-05	-1,95E-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	3,49E-08	1,52E-09	-6,73E-09	2,97E-08	2,38E-10	1,27E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,97E-10	1,02E-09	6,69E-12	-5,91E-09
IRP	kBq U235 eq.	3,19E-02	1,07E-03	3,45E-02	6,75E-02	1,68E-04	3,51E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,79E-04	4,62E-04	4,17E-06	1,75E-03
ETP-fw	CTUe	5,82E+01	2,28E-01	3,17E-01	5,88E+01	3,57E-02	2,79E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,94E-02	3,99E-01	6,59E-04	-3,43E+00
HTP-c	CTUh	3,51E-09	7,40E-12	-5,83E-10	2,94E-09	1,16E-12	1,47E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,93E-12	9,72E-12	1,52E-14	-1,31E-11
HTP-nc	CTUh	6,05E-08	2,50E-10	1,62E-10	6,09E-08	3,90E-11	4,06E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,50E-11	4,62E-10	4,69E-13	1,98E-08
SQP	-	2,68E+00	2,22E-01	1,67E+00	4,57E+00	3,47E-02	2,35E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,78E-02	1,87E-01	2,13E-03	-1,58E-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	6,68E-04	6,49E-07	-7,74E-06	6,61E-04	1,01E-07	3,25E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,69E-07	2,80E-07	1,52E-09	-1,23E-05
NHWD	kg	1,47E-01	1,62E-02	3,37E-02	1,97E-01	2,54E-03	1,02E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,23E-03	2,71E-03	6,90E-03	-1,00E-02
RWD	kg	2,51E-05	1,68E-06	2,89E-05	5,57E-05	2,63E-07	2,88E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,38E-07	5,49E-07	6,67E-09	6,05E-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	1,31E-01	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	7,38E-01	3,20E-03	6,87E-01	1,43E+00	5,01E-04	7,32E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,35E-04	1,45E-02	8,22E-06	2,07E-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	7,38E-01	3,20E-03	6,87E-01	1,43E+00	5,01E-04	7,32E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,35E-04	1,45E-02	8,22E-06	2,07E-02
PENRE	MJ	7,13E+00	2,72E-01	6,61E+00	1,40E+01	4,25E-02	6,74E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,08E-02	9,83E-02	1,08E-03	-7,41E-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	7,13E+00	2,72E-01	6,61E+00	1,40E+01	4,25E-02	6,74E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,08E-02	9,83E-02	1,08E-03	-7,41E-01
SM	kg	5,94E-02	0,00E+00	7,72E-05	5,94E-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	1,00E-02	3,12E-05	1,14E-02	2,14E-02	4,87E-06	1,06E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,12E-06	4,40E-05	1,09E-06	-3,70E-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 for the Walraven Nail-in Clamp KA P80 DN50 have been modelled to reflect realistic production and supply conditions. Primary data from Walraven's Czech Republic facility was prioritized, while verified secondary data from recognized databases was used where primary data was unavailable.

Data Collection Period

The dataset represents production processes carried out during 2023/2024.

Methodology and Reproducibility

The LCA was conducted in accordance with EN 15804+A2:2019, ISO 14040, ISO 14044, ISO 14025, and the NMD Bepalingsmethode v1.2 (2025). Calculations were performed using Ecochain Helix v4.3.1. The assessment covers the full life cycle, including raw material supply, transport, manufacturing, distribution, installation, end-of-life treatment, and potential benefits from reuse, recovery, and recycling.

Inventory and Allocation

All relevant materials, energy, emissions, packaging, and waste streams were included. Allocation followed EN 15804 principles, using mass-based allocation to distribute site-level inputs across products. No secondary materials were used, and cut-off criteria ensured excluded flows per module did not exceed 5% of mass or energy.

Data Sources

Primary data was sourced from Walraven's Czech production facility, including material composition, energy use, transport logistics, and manufacturing emissions. Where supplier-specific data was unavailable, representative datasets for steel, Class 4.8 screws, and zinc coatings were drawn from Ecoinvent 3.6 and Nationale Milieudatabase v3.8. Transport to zinc treatment facilities was also included.

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 BIS Nailin Clamp. The product consists primarily of multiple steel components (screws and body sections) and a zinc coating. The inventory data for these materials is based on the 2023/2024 production year, using bills of materials and background datasets from the Nationale Milieudatabase (NMD) v3.8 and Ecoinvent v3.6. Where necessary, generic datasets were applied. The steel composition was modeled with 57% primary and 43% secondary content, aligned with average market assumptions under Dutch LCA methodology.

Module A2 addresses inbound transport of all materials to the Walraven production facility in the Czech Republic. Transport is modeled using EN 15804+A2-compliant references from Ecoinvent 3.6 and NMD 3.8 with a default load factor of 50% (fully loaded inbound, empty outbound). Specific distances for different steel types and zinc treatment logistics are included in the life cycle inventory, but are not detailed here, in line with the summary format.

Module A3 captures the manufacturing phase at the Czech production site using primary data from 2023/2024. It includes electricity consumption (from the national grid), lubricating oil use, packaging, and waste generation. Steel scrap from clamp manufacturing is processed internally, and emissions are modeled accordingly. Zinc treatment electricity usage is included as well. Capital goods are excluded based on the EN 15804+A2 cutoff criterion, as they contribute less than 5% to the total environmental profile.

Module A4 covers the transport of the finished clamp from the production site to the customer. A standard 150 km distance is assumed per the Bepalingsmethode v1.2 (2025). Truck transport is modeled using references from NMD v3.8 and Ecoinvent 3.6 under the 50% load factor assumption.

Module A5 includes installation at the construction site. A 5% material loss is assumed during manual installation due to handling inefficiencies. No energy input is required for installation activities. Wastes including steel and zinc are transported to landfill or recycling centers (100 km), with transport modeled based on ton-kilometers.

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%

Module C1 assumes manual deconstruction with negligible energy input.
Module C2 includes waste transport: 50 km for steel/zinc to recycling facilities, modeled using standard truck assumptions from Ecoinvent 3.6 and NMD.
Module C3 accounts for waste processing: steel and zinc are sorted and recycled; no plastic or rubber are present in this product, hence no incineration modeled.
Module C4 includes final disposal: 5% of steel and zinc are sent to landfill, modeled using EN 15804+A2-compliant datasets.

Module D quantifies the benefits of recycling beyond the life cycle. Steel recycling is credited at 52% efficiency based on the difference between the recycled share (95%) and the steel's secondary content (43%). Zinc recycling benefits are credited at 95%. No plastics or rubbers are included in this product, so incineration recovery is not applicable.

This EPD summary follows the EN 15804+A2:2019 + AC:2021 standards and aligns with the Bepalingsmethode v1.2 (2025) for the Dutch construction sector. It is consistent with international LCA methodologies and ensures reliable reporting for environmental impact assessment of construction components.

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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