walraven

Environmental Product Declaration

According to ISO14025+EN15804 A2 (+indicators A1)

This declaration is for:

Walraven BISMAT® 1000 Stand Pipe Clamp M10 KA zinc plated DN70 75mm

Provided by:

J. van Walraven Holding B.V.

MRPI® registration:

1.1.00929.2025

Program operator:

Stichting MRPI®

Publisher:

Stichting MRPI®

www.mrpi.nl

Date of first issue:

15-5-2025

Date of this issue:

15-5-2025

Expiry date:

15-5-2030

ECO PLATFORM EPD VERIFIED

MRPI milieu relevante product informatie

COMPANY INFORMATION

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MRPI® REGISTRATION

1.1.00929.2025

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 BISMAT® 1000 Stand Pipe Clamp M10 KA zinc plated DN70 75mm

DECLARED UNIT / FUNCTIONAL UNIT

1 Piece

DESCRIPTION OF PRODUCT

The Walraven BISMAT® 1000 Stand Pipe Clamp M10 KA zinc plated DN70 75mm is a complete set with an adjustable wall plate, Walraven BISMAT® SL Guidance clamp, and BISMAT® SX Socket clamp. Designed for cast iron or plastic stand pipes, it allows tension-free fixing with infinite adjustment and adjustable pipe-to-wall distance. Suitable for mounting every second floor (every floor from Ø125 mm), it is made of zinc-plated steel and offers noise insulation exceeding DIN 4109 standards.

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 BISMAT® 1000 Stand Pipe Clamp M10 KA zinc plated DN70 75mm is a specialized installation set designed to securely fasten cast iron or plastic stand pipes in vertical runs. The assembly features an adjustable wall plate combined with a Walraven BISMAT® SL Guidance Clamp and a Walraven BISMAT® SX Socket Clamp, providing stable, tension-free fixing with infinite adjustment. Suitable for mounting every second floor at heights up to 3.0 m, and on every floor for pipes of Ø 125 mm or larger, the system allows adjustable pipe-to-wall distances to facilitate installation flexibility. Manufactured from high-quality steel with a zinc-plated finish, the clamp assembly offers excellent durability, corrosion resistance, and noise insulation performance that exceeds DIN 4109 standards.

Manufacturing Location
The BISMAT® 1000 Stand Pipe Clamp is produced in the Cista, Czech Republic under precision-controlled manufacturing processes that incorporate environmentally responsible practices.

Manufacturing Process Overview
The production begins with structural-grade steel processing, which is cut to specification to ensure optimal load performance. The adjustable wall plate and clamp components are precision-formed and machined to achieve perfect fit and smooth adjustment. Zinc plating is applied to protect the assembly from corrosion, extending product lifespan for both indoor and sheltered outdoor use. The final assembly integrates the SL Guidance and SX Socket clamps, enabling quick and efficient installation on-site.

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 zinc coating enhances corrosion resistance, extending the service life of the product and reducing the need for replacements. Noise insulation performance is tested according to DIN 4109, exceeding standard requirements and contributing to quieter building operation. Material efficiency is maintained by minimizing waste during production, and all steel components are fully recyclable at end-of-life.

Installation and Use Phase
The clamp assembly allows precise positioning of pipes with adjustable wall distances and tension-free fixing. It provides secure support for vertical stand pipes across multiple floors and maintains superior noise reduction performance through integrated insulation that surpasses DIN 4109 standards. The necessary internal transport of Czech Republic to Netherlands has been accounted in the production process of A1-A3.

End-of-Life Considerations
At the end of its service life, the steel components can be separated and recycled using standard industrial metal waste streams. The modular design facilitates easy disassembly for recycling.

Packaging and Transport
The product is supplied in recyclable cardboard packaging, and transport logistics are optimized to reduce environmental impact.

Name - Half parts	
Steel - Lower part	
Steel - Upper part	
Steel - Hollow pan head screw	
Steel - Nut, Washer DIN, Threaded Stud, Washer serrated	
Steel - Flanged Hexagon Bolt	
Rubber - EPDM	
Plastic - Spacer 5000 Black	

Total Weight	1013 g

Component (> 1%)	(%)
Steel (combined)	80,17%
Rubber - EPDM	16,70%

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.

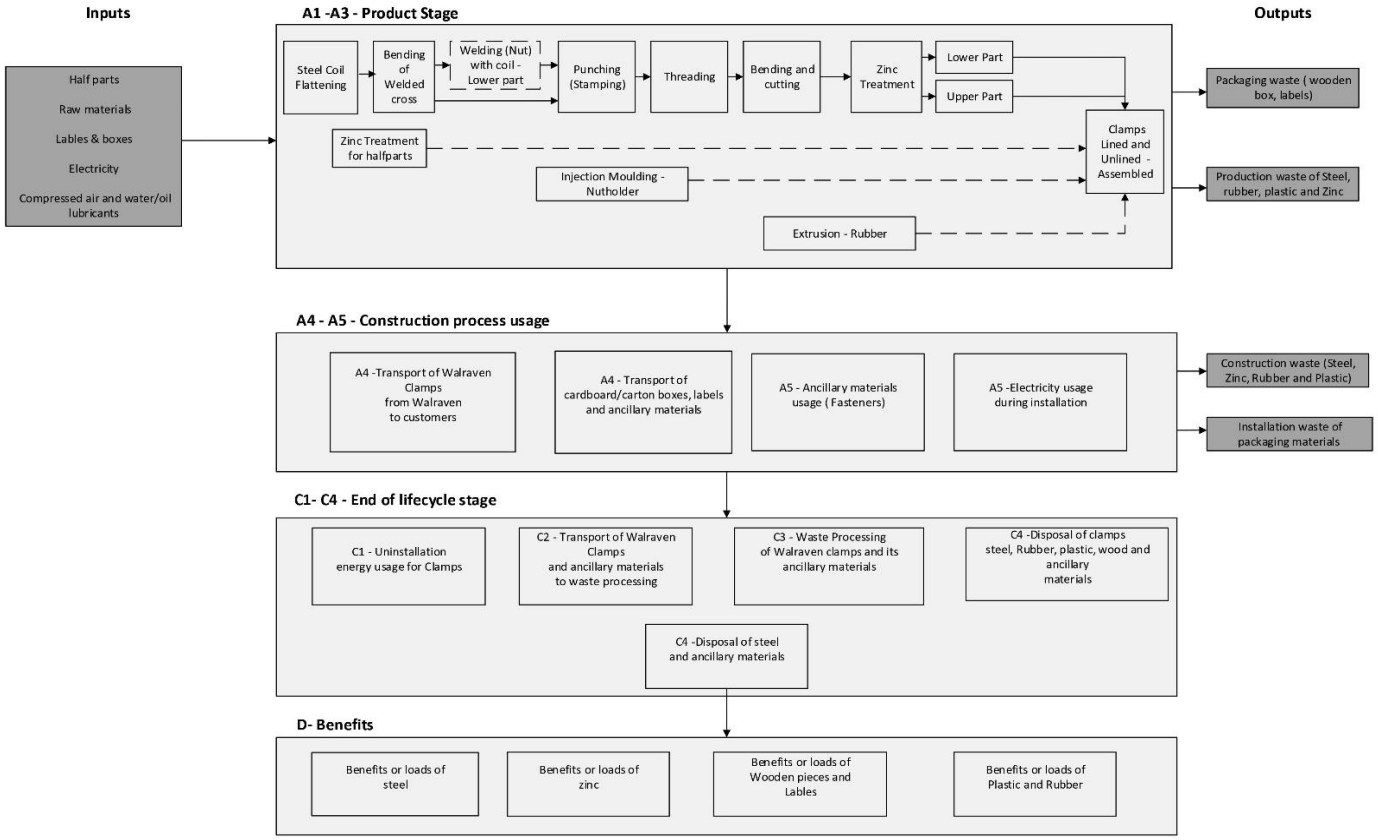
All significant inputs and outputs such as emissions, energy consumption, and material flows are accounted for. Materials representing less than 1% of the product's total weight may be excluded unless they are expected to contribute more than 5% to any environmental impact category. The cumulative environmental 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 BISMAT® 1000 Stand Pipe Clamp M10 KA zinc plated DN70 75mm. 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 and NMD Bepalingsmethode v1.2 (2025) are listed below:

Walraven Heavy Duty Clamp Stainless EPDM M12 DN200 8" 217-227mm
Walraven Heavy Duty Clamp Stainless EPDM M12 203-213mm
Walraven BISMAT® 1000 Stand Pipe Clamp M10 KA/GA zinc plated DN150 160
Walraven Heavy Duty Clamp Stainless EPDM M12 194-204mm
Walraven BISMAT® 1000 Stand Pipe Clamp M10 GA zinc plated DN80 83mm
Walraven BISMAT® 1000 Stand Pipe Clamp M10 KA/GA zinc plated DN100 110
Walraven BISMAT® 1000 Stand Pipe Clamp M10 KA zinc plated DN125 125mm
Walraven BISMAT® 1000 Stand Pipe Clamp M10 KA zinc plated DN70 75mm
Walraven BISMAT® 1000 Stand Pipe Clamp M10 KA zinc plated 90mm
Walraven BISMAT® 1000 Stand Pipe Clamp M10 GA zinc plated DN70 78mm
Walraven Heavy Duty Clamp Stainless EPDM M12 178-188mm
Walraven Heavy Duty Clamp Stainless EPDM M12 DN150 6" 159-169mm
Walraven Heavy Duty Clamp Stainless EPDM M12 101-109mm
Walraven HD1501 white EPDM 1/2" 86-92mm
Walraven BISMAT® 2000 Clamp zinc plated EPDM M10 210-219mm
Walraven HD1501 Clamp BUP EPDM 1/2" 86-92mm
Walraven HD1501 white EPDM M10/12 86-92mm
Walraven BISMAT® 2000 Clamp zinc plated EPDM M10 200-210mm
Walraven Heavy Duty Clamp Stainless EPDM M12 DN125 5" 132-140mm
Walraven HD1501 Clamp BUP EPDM M10/12 86-92mm
Walraven HD1501 white EPDM 1/2" 53-59mm
Walraven KSB2 Clamp zinc plated EPDM M8/10/1/2" 219-225mm
Walraven Bifix® 5000 Clamp G2 BUP EPDM green M10 200mm
Walraven Bifix® G2 Clamp BUP EPDM M8/10 219-225mm
Walraven Bifix® 1301 Clamp Stainless EPDM M10 244-250mm
Walraven Heavy Duty Clamp Stainless EPDM M12 125-133mm

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.	2,96E-02	4,73E-06	7,67E-06	2,96E-02	5,20E-07	1,48E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,21E-06	1,14E-06	1,54E-09	-1,07E-04
ADPF	MJ	5,64E+01	2,94E+00	8,75E+00	8,32E+04	3,11E-01	2,84E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,25E-01	3,40E-01	4,67E-03	-1,26E+01
GWP	kg CO2 eq.	3,42E+00	1,95E-01	6,66E-01	4,29E+00	2,03E-02	2,12E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,74E-02	5,13E-01	1,65E-04	-6,22E-01
ODP	kg CFC11 eq.	3,04E-07	3,43E-08	3,79E-08	3,76E-07	3,61E-09	1,61E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,42E-09	3,72E-09	5,49E-11	-6,92E-08
POCP	kg ethene eq.	3,22E-03	1,27E-04	-3,97E-04	2,95E-03	1,23E-05	9,40E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,86E-05	1,94E-05	1,76E-07	-1,13E-03
AP	kg SO2 eq.	1,99E-02	1,15E-03	2,26E-03	2,33E-02	8,94E-05	1,07E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,09E-04	2,41E-04	1,21E-06	-2,48E-03
EP	kg (PO4) 3 eq.	2,87E-03	1,95E-04	5,05E-04	3,57E-03	1,76E-05	1,69E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,10E-05	4,06E-05	2,33E-07	-2,93E-04

Toxicity indicators and ECI (Dutch market)

HTP	kg DCB eq.	5,31E+00	8,38E-02	-9,52E-02	5,30E+00	8,56E-03	2,51E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,00E-02	2,57E-02	7,45E-05	-3,45E-01
FAETP	kg DCB eq.	9,86E-02	2,35E-03	3,32E-03	1,04E-01	2,50E-04	5,30E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,83E-04	5,71E-04	1,77E-06	3,57E-04
MAETP	kg DCB eq.	1,93E+02	8,59E+00	1,77E+01	2,19E+02	8,99E-01	1,09E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,10E+00	2,22E+00	6,32E-03	-6,17E+00
TETP	kg DCB eq.	3,21E-02	2,92E-04	3,46E-03	3,58E-02	3,03E-05	2,75E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,06E-05	1,02E-04	1,87E-07	1,90E-02
ECI	euro	7,95E-01	2,50E-02	4,02E-02	8,60E-01	2,45E-03	4,10E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,72E-03	2,96E-02	2,33E-05	-7,74E-02
ADPF	kg Sb eq.	2,71E-02	1,41E-03	4,21E-03	4,00E+01	1,50E-04	1,37E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,49E-04	1,64E-04	2,25E-06	-6,07E-03

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.	3,52E+00	1,96E-01	5,14E-01	4,24E+00	2,05E-02	2,08E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,79E-02	5,14E-01	1,68E-04	-6,54E-01
GWP-fossil	kg CO2 eq.	3,50E+00	1,96E-01	6,52E-01	4,35E+00	2,05E-02	2,14E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,78E-02	5,13E-01	1,68E-04	-6,54E-01
GWP-biogenic	kg CO2 eq.	1,44E-02	7,14E-05	1,27E-03	1,57E-02	7,65E-06	7,81E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,78E-05	-1,79E-05	9,82E-08	0,00E+00
GWP-luluc	kg CO2 eq.	6,53E-03	7,63E-05	7,95E-04	7,40E-03	7,51E-06	3,77E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,75E-05	2,45E-05	4,68E-08	9,72E-05
ODP	kg CFC11 eq.	3,24E-07	4,30E-08	2,87E-08	3,96E-07	4,53E-09	1,69E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,06E-08	4,18E-09	6,92E-11	-7,68E-08
AP	mol H+ eq.	2,51E-02	1,50E-03	2,68E-03	2,92E-02	1,19E-04	1,35E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,78E-04	3,07E-04	1,59E-06	-2,99E-03
EP-fresh water	kg P eq.	2,56E-04	1,90E-06	1,23E-04	3,81E-04	2,07E-07	1,79E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,83E-07	1,44E-06	1,88E-09	-2,40E-05
EP-marine	kg N eq.	4,82E-03	4,81E-04	3,52E-04	5,66E-03	4,19E-05	2,69E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,78E-05	7,90E-05	5,48E-07	-4,90E-04
EP-terrestrial	mol N eq.	6,06E-02	5,32E-03	4,38E-03	7,03E-02	4,62E-04	3,35E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,08E-03	9,02E-04	6,05E-06	-5,72E-03
POCP	kg NMVOC eq.	1,76E-02	1,49E-03	1,59E-04	1,93E-02	1,32E-04	8,25E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,08E-04	2,38E-04	1,76E-06	-3,43E-03
ADP-minerals & metals	kg Sb eq.	2,96E-02	4,73E-06	7,67E-06	2,96E-02	5,20E-07	1,48E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,21E-06	1,14E-06	1,54E-09	-1,07E-04
ADP-fossil	MJ, net calorific value	5,25E+01	2,93E+00	1,01E+01	6,55E+01	3,09E-01	2,80E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,22E-01	3,40E-01	4,70E-03	-1,09E+01
WDP	m3 world eq. Deprived	2,16E+00	1,01E-02	1,82E-01	2,35E+00	1,11E-03	1,05E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,58E-03	8,98E-03	2,11E-04	-2,57E-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	2,37E-07	1,68E-08	-2,06E-08	2,33E-07	1,84E-09	1,01E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,30E-09	3,28E-09	3,09E-11	-4,00E-08
IRP	kBq U235 eq.	2,34E-01	1,23E-02	6,32E-02	3,10E-01	1,30E-03	1,47E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,02E-03	1,53E-03	1,93E-05	-2,10E-02
ETP-fw	CTUe	3,41E+02	2,57E+00	-2,66E+00	3,41E+02	2,76E-01	1,63E+01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,44E-01	2,10E+00	3,05E-03	-1,85E+01
HTP-c	CTUh	1,93E-08	8,73E-11	-1,60E-09	1,78E-08	8,95E-12	8,84E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,09E-11	3,52E-11	7,04E-14	-1,91E-10
HTP-nc	CTUh	3,38E-07	2,77E-09	-2,96E-09	3,38E-07	3,02E-10	2,07E-08	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,04E-10	1,70E-09	2,17E-12	7,38E-08
SQP	-	1,80E+01	2,41E+00	2,76E+00	2,32E+01	2,68E-01	1,12E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,26E-01	5,60E-01	9,85E-03	-2,23E+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	3,85E-03	7,14E-06	-2,45E-05	3,83E-03	7,84E-07	1,89E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,83E-06	1,21E-06	7,02E-09	-5,22E-05
NHWD	kg	8,27E-01	1,75E-01	5,43E-02	1,06E+00	1,96E-02	5,57E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,58E-02	1,92E-02	3,19E-02	-5,87E-02
RWD	kg	2,07E-04	1,93E-05	5,24E-05	2,79E-04	2,03E-06	1,27E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,74E-06	1,82E-06	3,08E-08	-3,33E-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	4,32E-04	4,32E-04	0,00E+00	2,16E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	7,32E-01	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	2,62E-05	2,62E-05	0,00E+00	1,31E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	1,57E-01	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	1,51E-03	1,51E-03	0,00E+00	7,55E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,32E+00
ETE	MJ	0,00E+00	0,00E+00	8,78E-04	8,78E-04	0,00E+00	4,39E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,68E-01

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	4,89E+00	3,56E-02	1,21E+00	6,14E+00	3,87E-03	2,96E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,03E-03	4,57E-02	3,80E-05	-2,83E-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	4,89E+00	3,56E-02	1,21E+00	6,14E+00	3,87E-03	2,96E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,03E-03	4,57E-02	3,80E-05	-2,83E-01
PENRE	MJ	5,58E+01	3,11E+00	1,09E+01	6,98E+01	3,28E-01	2,99E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,66E-01	3,62E-01	4,99E-03	-1,15E+01
PENRM	MJ	4,27E+00	0,00E+00	0,00E+00	4,27E+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	6,01E+01	3,11E+00	1,09E+01	7,41E+01	3,28E-01	2,99E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,66E-01	3,62E-01	4,99E-03	-1,15E+01
SM	kg	3,32E-01	0,00E+00	1,26E-04	3,32E-01	0,00E+00	6,31E-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	6,46E-02	3,44E-04	2,10E-02	8,60E-02	3,77E-05	4,03E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,79E-05	7,64E-04	5,02E-06	-6,36E-03

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 modelled to reflect actual production conditions as accurately as possible. The primary principle of data quality assessment is that site-specific, primary data is prioritized. Where primary data was unavailable, reliable reference data from established databases was applied. For module A1, product composition data provided by the manufacturer was used. Module A2 incorporates transportation data for raw materials to the production site. Module A3 includes site-specific energy consumption and waste production data collected for the 2023/2024 production year. Background processes are sourced from the Dutch Nationale Milieudatabase v3.8, based on Ecoinvent 3.6 datasets.

Data Collection Period

The dataset represents production conditions and methods used during the year 2023/2024.

Methodology and Reproducibility

The life cycle assessment was conducted in accordance with EN 15804+A2:2019, NEN-EN ISO 14040, 14044, and 14025, and follows the NMD Bepalingsmethode v1.2 (2025). Calculations were performed using Ecochain Helix software version 4.3.1. The assessment encompasses the full life cycle of the product, covering A1–A3 (raw material extraction, transport, and manufacturing), A4–A5 (distribution and installation), B1–B7 (use stage where applicable), C1–C4 (end-of-life processes), and D (reuse, recovery, and recycling potential).

Inventory and Allocation

The inventory accounts for quantities, qualities, and allocation of materials, energy flows, and emissions associated with production. Allocation follows EN 15804 principles: all site-level inputs, including energy and auxiliary materials, are assigned to production processes and then allocated to products using mass-based allocation. No secondary materials were used during production. Cut-off criteria were applied to ensure that excluded flows per module do not exceed 5% of total energy or mass. End-of-life stages incorporate realistic scenarios for recovery, recycling, and disposal, consistent with EN 15804+A2 and NMD methodology.

Data Sources

Primary data was collected from the Czech Republic production site, covering product composition, energy use, transport logistics, and waste treatment. Where site-specific data was unavailable, reference datasets for steel, zinc, and EPDM rubber were obtained from NMD v3.8 and Ecoinvent 3.6 for life cycle modeling

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

Modules A1 to A3 cover the cradle-to-gate life cycle stages. Module A1 models the raw material extraction and upstream processes. The clamp is composed of various grades of steel, EPDM rubber, polypropylene (PP) plastic, and zinc coating. These materials were modeled using NMD v3.8 and Ecoinvent v3.6. In cases where primary data was unavailable, generic data was applied. Steel is modeled with 57% primary and 43% secondary content, in alignment with NMD average market assumptions.

Module A2 includes the transport of raw materials to the Walraven production site in the Czech Republic. Distances are based on supplier data and reflect multiple transport modes including road (truck) and ship. All transport assumes a 50% average load factor, modeled using 0001-tra&Transport, vrachtwagen from NMD v3.8.

Module A3 includes production-phase processes based on data from the 2023/2024 operational year. It includes energy use from the national grid, lubricant consumption, packaging materials, and process emissions. Steel scrap and other waste generated during production were accounted for and modeled for recycling or disposal. Capital goods were excluded per EN 15804+A2 cut-off rules, since their contribution was under 5%.

Module A4 addresses the transport of the finished clamp to the installation site. A standard 150 km transport distance was assumed, using road transport with a 50% load factor, in accordance with Bepalingsmethode v1.2 and EN 15804+A2. Emissions were calculated using standard NMD transport datasets.

Module A5 considers the installation phase, assuming manual installation without energy use. A 5% material loss was applied to account for handling inefficiencies. Waste generated during installation was modeled by material type: Plastics and rubber transported 100 km to incineration (AVI) facilities and steel transported 100 km to landfill, consistent with fixed end-of-life assumptions.

Waste fractions were modeled as follows:

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

End-of-Life – Modules C1 to C4
Module C1 models the manual deconstruction of the clamp at the end of its service life, with negligible energy consumption. Module C2 covers the transport of deconstructed materials to waste processing facilities, with steel and zinc transported 50 km to recycling sites, and rubber and plastic transported 100 km to incineration plants. Transport emissions were calculated using the freight truck dataset from NMD v3.8. Module C3 addresses waste processing, where steel and zinc are fully sorted and recycled, and rubber and plastic are entirely incinerated with energy recovery. Emission factors for these processes are sourced from NMD v3.8, using 0264-avC&Verbranden kunststoffen for plastics, 0260-avC&Verbranden rubber/EPDM for rubber, and 0315-reC&Sorteren en persen oud ijzer for steel. Module C4 models final disposal, assuming that 5% of steel and zinc are sent to landfill, using 0253-sto&Stort staal for steel and 0248-sto&Stort koper, lood, verzinkt staal, zink for zinc, while rubber and plastic are fully incinerated with no landfill contribution.

Benefits Beyond the System Boundary – Module D
Module D quantifies environmental benefits beyond the system boundary. The steel recycling benefit is calculated at 52%, derived from a 95% recycling rate minus a 43% secondary material share. Zinc recycling benefits are modeled at 95%, and energy recovery from rubber and plastic incineration is credited at 100%, displacing fossil energy use.

This assessment is fully compliant with EN 15804+A2:2019/AC:2021 and follows the Bepalingsmethode v1.2 (2025), ensuring that all life cycle phases are modeled according to current Dutch and European LCA standards.

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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