Environmental
Product
Declaration

According to ISO14025+EN15804 A2 (+indicators A1)

This declaration is for:
Walraven Bifix® G2 Clamp BUP M8/10 100-105mm

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

MRPI® registration:
1.1.00943.2025

Program operator:
Stichting MRPI®
Publisher:
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MRPI® REGISTRATION

1.1.00943.2025

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 Bifix® G2 Clamp BUP M8/10 100-105mm

DECLARED UNIT / FUNCTIONAL UNIT

1 Piece

DESCRIPTION OF PRODUCT

The Walraven Bifix® G2 Clamp BUP M8/10 100–105mm is a two-screw steel pipe clamp featuring a quick locking system for efficient installation. Designed for indoor and outdoor use, it is part of the BIS UltraProtect® 1000 system, offering exceptional corrosion resistance with a minimum of 1,000 hours salt spray protection per ISO 9227. Ideal for secure pipe support in demanding environments.

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

The Walraven Bifix® G2 Clamp BUP M8/10 100-105mm is a premium pipe clamp engineered for securing steel, copper, and multilayer pipes in the Ø 100-105 mm range. Manufactured in the Mijdrecht, Netherlands using precision processes, it features a robust steel body with a quick locking system and BUP 1000 surface protection. Its high strength and corrosion resistance make it ideal for reliable indoor and outdoor pipe support.

Manufacturing Process:
Steel Coil Processing: Flat steel is cut and prepared to create the clamp's structure, ensuring dimensional accuracy and mechanical integrity.
Stamping & Bending: Both clamp halves are precision-formed for consistent pipe alignment and clamping force.
Threading & Welding: A resistance-welded combination nut (M8/10) is affixed to the clamp, providing flexible and robust mounting.
Surface Treatment: The clamp features BIS UltraProtect® 1000 (BUP 1000) coating, offering up to 1000 hours corrosion resistance in accordance with ISO 9227:2012.
Final Assembly: Includes pre-installed locking screws, anti-loss washer (POM), and nut holder (PP), ensuring the product is ready-to-use out of the box.

Electricity usage references:
Reference: 0569-pro & Elektriciteit, Nederlandse mix, bij consument, per kWh (73% grijs, 27% hernieuwbaar), Database: Ecoinvent v3.6 (Cut-off, NMD+EI), GWP : 0.389 kg CO_2-eq/kWh

Reference: 0573-pro & Elektriciteit, hernieuwbaar, uit PV, bij consument, per kWh, Database: Ecoinvent v3.6 (Cut-off, NMD+EI), GWP : 0.095 kg CO2-eq /kWh

Environmental and Installation Features:
Corrosion Protection: The BUP 1000 coating ensures long-lasting resistance in outdoor and industrial settings, eliminating the need for post-installation treatments.

Packaging and Transport:
Packaging: Supplied in recyclable cardboard boxes, clearly labeled for logistics efficiency.

Installation Readiness: Product arrives fully assembled and prepared for immediate installation.

Reference Service Life (RSL): 50 years

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	155 g

Component (> 1%)	(%)
Steel (combined)	96,83%

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 Bifix® G2 Clamps, which confirms a minimum working life of 50 years under appropriate usage and maintenance conditions.

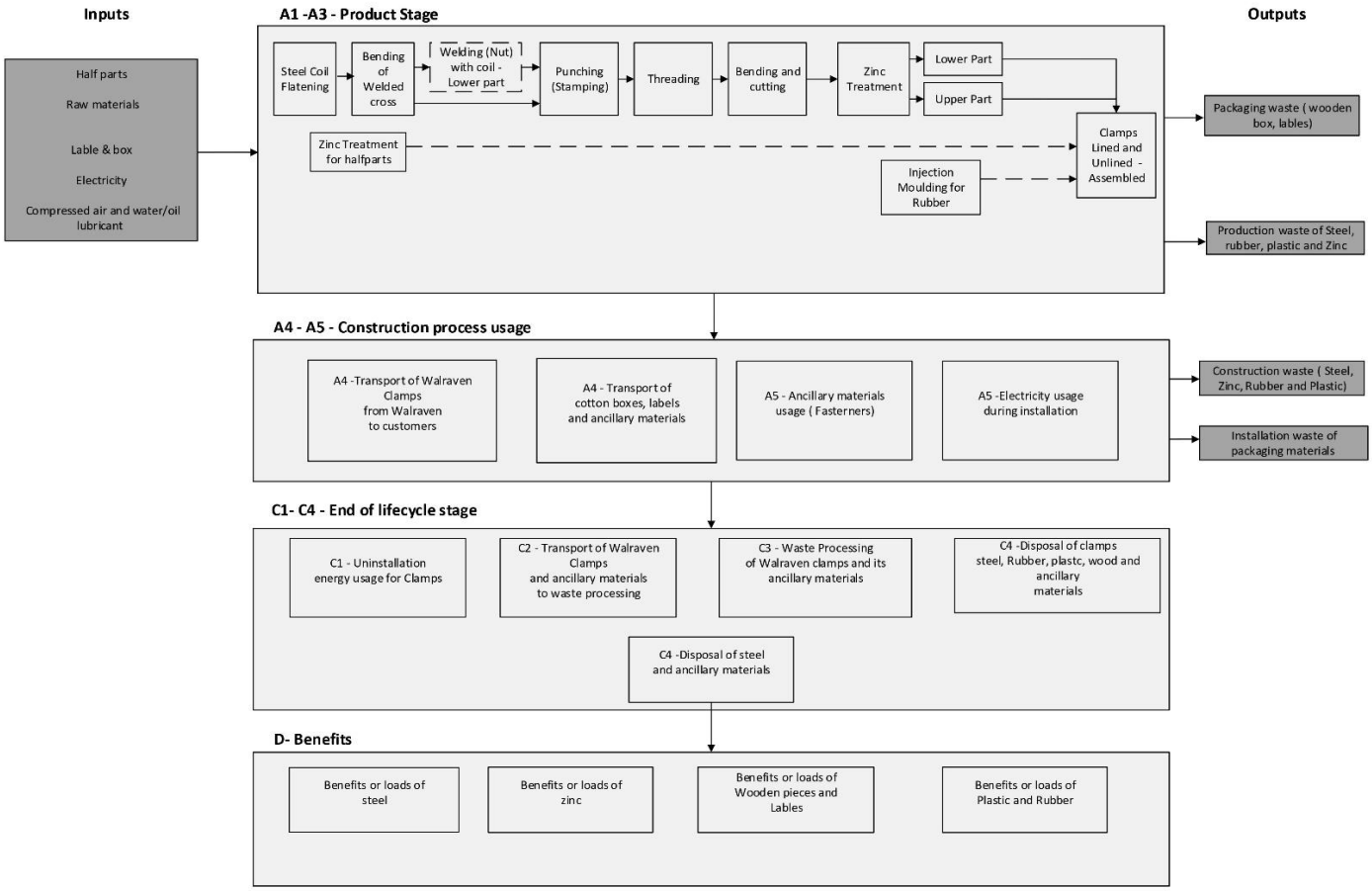
All significant inputs and outputs such as emissions, energy consumption, and material flows are accounted for. Materials representing less than 1% of the product's total weight may be excluded unless they are expected to contribute more than 5% to any environmental impact category. The cumulative environmental impact of excluded materials shall not exceed 5% for any given category.

This comprehensive approach ensures a scientifically sound and holistic understanding of the Walraven Clamp’s environmental footprint throughout its full life cycle.

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport gate to site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse - Recovery - Recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x

X = Modules Assessed

ND = Not Declared



REPRESENTATIVENESS

The aggregation was done by choosing the reference product as Walraven Bifix® G2 Clamp BUP M8/10 100-105mm. 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 Bifix® G2 Clamp BUP M8/10 108-115mm
Walraven 4000 Clamp M8 BUP 110mm
Walraven Bifix® G2 Clamp BUP M8/10 100-105mm
Walraven KSB2 Clamp zinc plated EPDM M8/10/1/2" 36-39mm
Walraven Duplo pre-galvanized EPDM black 3/4"-28mm
Walraven KSB2 Clamp zinc plated EPDM M8/10/1/2" 31-35mm
Walraven KSB2 Clamp zinc plated EPDM M8/10/1/2" 15-19mm
Walraven KSB2 Clamp zinc plated EPDM M8/10/1/2" 10-14mm
Walraven Sprinkler Clamp TA41 FM/UL M10 3" (DN80)
Walraven Duplo Double Pipe Clamp pre-galvanized 1"
Walraven Bifix® G2 Clamp BUP M8/10 88-91mm
Walraven Double Wall Clamp pre-galvanized EPDM Pin 120 3/4"-28mm
Walraven KSB2 Clamp zinc plated EPDM M8/10/1/2" 40-45mm
Walraven Sprinkler Clamp TA41 FM/UL M10 2 1/2 (DN65)

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.	6,79E-03	3,45E-06	4,28E-07	6,79E-03	7,95E-08	3,19E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,32E-07	2,60E-07	4,78E-10	-4,17E-04
ADPF	MJ	1,01E+01	2,07E+00	4,29E-01	1,26E+01	4,76E-02	5,44E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,93E-02	6,40E-02	1,45E-03	-1,93E+00
GWP	kg CO2 eq.	6,87E-01	1,35E-01	2,34E-02	8,46E-01	3,11E-03	3,56E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,19E-03	5,88E-03	5,13E-05	-1,47E-01
ODP	kg CFC11 eq.	4,86E-08	2,40E-08	2,27E-09	7,48E-08	5,52E-10	3,56E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,20E-10	6,15E-10	1,70E-11	-5,79E-09
POCP	kg ethene eq.	6,34E-04	8,18E-05	2,07E-07	7,16E-04	1,88E-06	2,17E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,13E-06	4,10E-06	5,45E-08	-2,91E-04
AP	kg SO2 eq.	3,93E-03	6,03E-04	3,97E-05	4,58E-03	1,37E-05	2,04E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,28E-05	4,57E-05	3,73E-07	-5,72E-04
EP	kg (PO4) 3 eq.	5,65E-04	1,18E-04	7,09E-06	6,90E-04	2,69E-06	3,16E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,48E-06	5,85E-06	7,23E-08	-7,14E-05

Toxicity indicators and ECI (Dutch market)

HTP	kg DCB eq.	1,35E+00	5,70E-02	2,16E-03	1,41E+00	1,31E-03	6,62E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,18E-03	5,67E-03	2,43E-05	-9,45E-02
FAETP	kg DCB eq.	2,22E-02	1,66E-03	8,59E-05	2,39E-02	3,82E-05	1,21E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,37E-05	1,09E-04	1,22E-06	3,80E-05
MAETP	kg DCB eq.	4,19E+01	5,98E+00	3,41E-01	4,82E+01	1,38E-01	2,41E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,29E-01	4,66E-01	2,06E-03	-8,27E-01
TETP	kg DCB eq.	8,12E-03	2,01E-04	1,82E-04	8,50E-03	4,63E-06	7,64E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,72E-06	1,76E-05	6,09E-08	6,74E-03
ECI	euro	1,85E-01	1,63E-02	1,67E-03	2,03E-01	3,75E-04	9,30E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,25E-04	1,10E-03	7,36E-06	-1,93E-02
ADPF	kg Sb eq.	4,87E-03	9,93E-04	2,06E-04	6,07E-03	2,29E-05	2,61E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,81E-05	3,08E-05	6,96E-07	-9,29E-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.	7,08E-01	1,36E-01	-3,41E-03	8,41E-01	3,14E-03	3,49E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,23E-03	5,96E-03	5,23E-05	-1,57E-01
GWP-fossil	kg CO2 eq.	7,03E-01	1,36E-01	2,34E-02	8,63E-01	3,14E-03	3,60E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,23E-03	5,94E-03	5,23E-05	-1,57E-01
GWP-biogenic	kg CO2 eq.	3,04E-03	5,08E-05	-5,00E-07	3,09E-03	1,17E-06	1,58E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,95E-06	3,25E-03	3,24E-08	0,00E+00
GWP-luluc	kg CO2 eq.	1,36E-03	5,01E-05	-5,55E-07	1,41E-03	1,15E-06	7,33E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,92E-06	5,32E-06	1,46E-08	4,90E-05
ODP	kg CFC11 eq.	4,93E-08	3,01E-08	2,47E-09	8,18E-08	6,93E-10	3,99E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,15E-09	7,08E-10	2,14E-11	-4,68E-09
AP	mol H+ eq.	4,85E-03	8,01E-04	5,35E-05	5,71E-03	1,82E-05	2,56E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,03E-05	5,71E-05	4,94E-07	-7,02E-04
EP-fresh water	kg PO4 eq.	5,55E-05	1,37E-06	4,55E-07	5,74E-05	3,17E-08	2,55E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,28E-08	3,21E-07	5,90E-10	-6,81E-06
EP-marine	kg N eq.	1,03E-03	2,81E-04	1,09E-05	1,32E-03	6,41E-06	6,08E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,07E-05	1,26E-05	1,71E-07	-1,36E-04
EP-terrestrial	mol N eq.	1,14E-02	3,10E-03	1,65E-04	1,46E-02	7,07E-05	6,70E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,18E-04	1,46E-04	1,88E-06	-1,57E-03
POCP	kg NMVOC eq.	3,67E-03	8,83E-04	2,68E-05	4,58E-03	2,02E-05	1,89E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,36E-05	4,00E-05	5,46E-07	-8,97E-04
ADP-minerals & metals	kg Sb eq.	6,79E-03	3,45E-06	4,28E-07	6,79E-03	7,95E-08	3,19E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,32E-07	2,60E-07	4,78E-10	-4,17E-04
ADP-fossil	MJ, net calorific value	9,11E+00	2,05E+00	3,98E-01	1,16E+01	4,73E-02	5,26E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,89E-02	6,55E-02	1,46E-03	-1,24E+00
WDP	m3 world eq. Deprived	4,48E-01	7,34E-03	5,38E-03	4,61E-01	1,69E-04	2,09E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,82E-04	7,14E-04	6,27E-05	-4,43E-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	4,74E-08	1,22E-08	8,22E-11	5,97E-08	2,82E-10	2,62E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,70E-10	7,14E-10	9,62E-12	-8,74E-09
IRP	kBq U235 eq.	4,30E-02	8,61E-03	6,61E-04	5,23E-02	1,98E-04	2,69E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,30E-04	3,26E-04	6,04E-06	6,05E-04
ETP-fw	CTUe	7,76E+01	1,83E+00	2,13E-01	7,97E+01	4,22E-02	3,58E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,03E-02	2,94E-01	1,23E-03	-8,46E+00
HTP-c	CTUh	4,76E-09	5,95E-11	-1,12E-11	4,80E-09	1,37E-12	2,35E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,28E-12	7,01E-12	2,40E-14	-1,11E-10
HTP-nc	CTUh	8,13E-08	2,00E-09	1,58E-10	8,34E-08	4,62E-11	5,41E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,69E-11	3,27E-10	8,99E-13	2,44E-08
SQP	-	3,61E+00	1,78E+00	5,03E-01	5,89E+00	4,10E-02	2,90E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,84E-02	1,30E-01	3,08E-03	-3,39E-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	8,85E-04	5,20E-06	1,56E-06	8,92E-04	1,20E-07	4,11E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,00E-07	1,97E-07	2,16E-09	-7,07E-05
NHWD	kg	2,00E-01	1,30E-01	7,55E-04	3,31E-01	3,00E-03	1,67E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,00E-03	1,91E-03	9,73E-03	-1,60E-02
RWD	kg	3,39E-05	1,35E-05	6,30E-07	4,81E-05	3,11E-07	2,44E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,18E-07	3,86E-07	9,58E-09	-4,34E-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	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	1,79E-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	4,80E-04	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	3,60E-03
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	2,09E-03

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	9,97E-01	2,57E-02	1,58E-01	1,18E+00	5,92E-04	5,95E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,87E-04	1,02E-02	1,51E-05	-3,99E-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	9,97E-01	2,57E-02	1,58E-01	1,18E+00	5,92E-04	5,95E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,87E-04	1,02E-02	1,51E-05	-3,99E-03
PENRE	MJ	9,69E+00	2,18E+00	4,35E-01	1,23E+01	5,02E-02	5,61E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,37E-02	6,94E-02	1,55E-03	-1,29E+00
PENRM	MJ	1,16E-02	0,00E+00	0,00E+00	1,16E-02	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	9,70E+00	2,18E+00	4,35E-01	1,23E+01	5,02E-02	5,61E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,37E-02	6,94E-02	1,55E-03	-1,29E+00
SM	kg	8,12E-02	0,00E+00	4,58E-05	8,13E-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	1,35E-02	2,50E-04	1,77E-04	1,39E-02	5,76E-06	6,48E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,61E-06	3,25E-05	1,57E-06	-1,02E-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 as realistically as possible. Data quality assessment is based on the principle that the primary data used for processes occurring at the production site is selected in the first instance. Where this is not available, other reference data is selected from appropriate sources and databases.

Data collection period:
The dataset is representative for the production processes used in 2023 and 2024.

Methodology and reproducibility:
The data regarding all the steel coils were collected from the supplier through the data collection template regarding the materials, transport, etc. For suppliers that have not delivered sufficient information, alternative sources such as public references, industry statistics, and literature references have been used. Based on this information, representative references from the EcoInvent 3.6 and Nationale Milieu Database v3.8 (NMD) database have been selected for the various materials and resources used for the Walraven Clamps.

The end-of-life processing for phase C2-C4 + D follows standardized scenarios outlined in NEN-EN15804+A2 (version 1.2, January 2025), which is the Environmental Performance Assessment Method for Construction Works.

In this case of Walraven Clamps, 20% allocation and worst case senario methods were used for the grouping by choosing the reference products following the Bepalingsmethode v1.2 (2025).

Inventory and Allocation:
In this section, the quantity, quality, and allocation of various materials, energy streams, and emissions by processes and products are outlined. The system boundaries that have been adopted are in accordance with the modular approach of I.S. EN 15804+A2 & NMD Bepalingsmethode v1.2 (2025). Due to the different products involved in this modelling, by choosing the worst-case scenario of taking the reference value of Walraven Bifix® Clamps Unlined M8/10 100 -105 mm and trying to group the products which has smaller deviations in the overall impact categories by following the 20% allocation as per the EN 15804+A2 & NMD Bepalingsmethode v1.2 (2025). The remaining dimensions were grouped along with Walraven Bifix® G2 Clamp BUP M8/10 100-105mm are listed above.

Data Sources:
The data used for the Walraven clamps products, its transport and installation processes come from the energy and resources administration, production, sourcing, and planning departments of Walraven. Distance from the raw material suppliers (possibly through the intermediary) and technical information sheet of the raw material has also been inventoried. And due to the unavailability of some raw material composition data, the generic reference for steel from NMD 3.8 and Ecoinvent 3.6 databases were chosen for the LCA modelling.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

Modules A1 to A3 detail the upstream and manufacturing life cycle stages. Module A1 includes raw material extraction, processing, and inputs such as packaging, water, and lubricants. For the Walraven Bifix® G2 Clamp BUP M8/10 100–105mm, modeling is based on 2023–2024 production data. Primary materials include multiple steel grades, polypropylene (PP), and zinc coating. Data is derived from NMD v3.8 and Ecoinvent v3.6, using generic references where needed. Steel composition assumes 57% primary and 43% secondary content in line with NMD standards.

Module A2 models the transportation of raw materials to the Walraven production site in Mijdrecht. All transport is modeled in accordance with EN 15804:2012+A2:2019/AC:2021, using datasets from NMD v3.8 and Ecoinvent v3.6, with a 50% load factor representing a full trip to the site and an empty return. Key transport distances include 1,600 km by truck for PP plastic, for steel components depending on the supplier, with an additional 100 km applied for steel transported to the zinc treating facility, and 100 km for zinc coating processes. All road transport emissions are calculated using the dataset 0001-tra&Transport, vrachtwagen (freight, lorry, unspecified {GLO}) from NMD v3.8 and Ecoinvent v3.6.

Module A3 models the production processes at the Walraven Mijdrecht facility, including electricity use, fuels, packaging, and production waste. Energy consumption is divided between Dutch grid electricity and on-site solar power. Additional electricity use is allocated to zinc treatment processes.

Steel scrap generated during clamp production is partially recycled. Recycling and waste allocations were determined based on the Mijdrecht plant's production share within the total organizational output. Transportation of production waste to recycling or disposal facilities is also modeled. In addition, lubricating oil was used in production as an auxiliary input. Capital goods were excluded from this module per the EN 15804+A2 cutoff rule, as their impact was below the 5% environmental significance threshold.

Module A4 addresses transportation of the finished clamp to installation sites. A standard 150 km distance was assumed, in accordance with Bepalingsmethode v1.2 (2025). A 50% average load factor was used, and emissions were modeled using the same NMD v3.8 freight truck reference.

Module A5 includes installation related material losses and waste transport. A 5% loss rate was applied to both steel and plastic based on typical manual installation inefficiencies. No energy was included, as installation is conducted manually. Waste transport assumptions: Steel: 100 km to landfill and Plastic: 100 km to AVI (waste incineration)

End-of-life fractions used were based on Bepalingsmethode v1.2 (2025):

Material	Leave	Landfill	Incineration (AVI)	Recycling	Reuse
Steel, Zinc	0	0,05	0	0,95	0
Rubber/Plastic	0	0	1	0	0

Module C1 addresses the manual dismantling of the clamp at the end of its service life. No energy consumption is associated with this stage.

Module C2 models the transport of deconstructed materials to appropriate waste processing facilities. Steel and zinc are transported 50 km to recycling or landfill sites, while plastic is transported 100 km to AVI incineration plants. Transport emissions are calculated using the freight truck reference from NMD v3.8 and Ecoinvent v3.6.

Module C3 covers waste processing. Steel and zinc are assumed to be fully recycled, while plastic is fully incinerated at AVI facilities with energy recovery. Emissions are modeled using 0264-avC&Verbranden kunststoffen (28.67 MJ/kg) for plastic, 0315-reC&Sorteren en persen oud ijzer for steel, and zinc is included within the steel treatment dataset. All datasets are sourced from NMD v3.8 and Ecoinvent v3.6.

Module C4 addresses final disposal. A residual 5% of steel and zinc is assumed to be landfilled, using 0253-sto&Stort staal for steel and 0248-sto&Stort koper, lood, verzinkt staal, zink for zinc.

Module D quantifies benefits beyond the system boundary. Steel recycling provides a 52% net substitution benefit, reflecting a 95% recycling rate minus 43% secondary content. Zinc is modeled with a 95% recycling benefit, while plastic incineration at AVI facilities is credited with 100% energy substitution through waste-to-energy recovery.

This environmental declaration is prepared in accordance with EN 15804:2012+A2:2019/AC:2021 and the Dutch determination method Bepalingsmethode v1.2 (2025). All data are verified and modeled using NMD v3.8 and Ecoinvent v3.6, reflecting current Dutch and international best practices for construction product environmental declarations.

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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