Environmental
Product
Declaration

According to ISO14025+EN15804 A2 (+indicators A1)

This declaration is for:
Walraven Bifix® G2 Clamp BUP EPDM M8 80-83mm

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

MRPI® registration:
1.1.00941.2025

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MRPI® REGISTRATION

1.1.00941.2025

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 EPDM M8 80-83mm

DECLARED UNIT / FUNCTIONAL UNIT

1 Piece

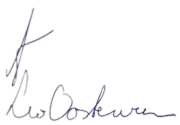
DESCRIPTION OF PRODUCT

The Walraven Bifix® G2 Clamp BUP EPDM M8 80-83mm is a durable, two-screw pipe clamp designed for steel, copper, cast iron, and multilayer pipes. It features a quick-lock mechanism and dual-component EPDM lining for easy installation and superior noise reduction up to 23 dB(A). With BIS UltraProtect® 1000 coating, it withstands 1,000 hours of salt spray and is suitable for indoor and outdoor use.

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 Bifix® G2 Clamp BUP EPDM M8 80-83mm is a high-performance, pre-assembled pipe clamp engineered for securing steel, copper, cast iron, and multilayer pipes (Ø 80–83 mm) across residential, commercial, and industrial installations. It features a quick locking mechanism and dual component EPDM lining for enhanced noise reduction and reliable support. Suitable for both indoor and outdoor use, it delivers strength, durability, and long term corrosion resistance.

Manufacturing Location:
Manufactured in the Mijdrecht, Netherlands using high-precision, environmentally responsible processes.

Manufacturing Process Overview:
Steel Coil Processing: Raw steel is flattened and cut to shape, ensuring high structural integrity and minimal material waste.
Stamping & Bending: Clamp components are formed using precision tooling for consistent quality and material efficiency.
Threading & Welding: Resistance welding is used to attach the connecting nut, providing strong, energy efficient joint construction.
Surface Treatment: Coated with BIS UltraProtect® 1000 (BUP 1000), delivering up to 1000 hours of corrosion resistance per ISO 9227:2012, without the need for additional coatings.
Rubber Lining Application: EPDM linings (black 55° ±5 Shore A, green 80° ±5 Shore A) are applied to meet DIN 4109 acoustic standards and support vibration and noise reduction.
Final Assembly: Includes pre-installed locking screws, captive nut holder (PP), and anti-loss washer (POM) to minimize installation steps and packaging components.

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 Performance:
Corrosion Resistance: BUP 1000 coating eliminates the need for post-installation corrosion protection, reducing environmental emissions and maintenance interventions.
Material Efficiency: All steel and polymer components are optimized for recyclability. EPDM linings are free from PVC and halogens.
Waste Reduction: All production waste is minimized, with metal and plastic offcuts reused or recycled within the supply chain.
Long Lifecycle: Designed for durability and reusability, significantly reducing environmental impacts over time through reduced replacement frequency.

Installation and Use Phase:
Quick Installation: The integrated quick-lock system and pre-installed fasteners reduce on-site labor time and energy usage.
Low Noise Emission: DIN 4109 compliant rubber lining reduces airborne and structure-borne sound, enhancing comfort and building compliance.
Zero VOC Emission: Product materials emit no Volatile Organic Compounds (VOCs), ensuring safe indoor air quality.

End-of-Life Considerations:
Disassembly: Clamp components can be easily separated for recycling at end-of-life.
Recyclability: Primary materials (steel, EPDM, PP, POM) are all recyclable through conventional industrial waste processing systems.

Packaging and Transport:
Packaging: Supplied in recyclable cardboard cartons. Packaging is optimized for volume efficiency to reduce transport emissions.
Logistics: Transport is managed through consolidated shipments to reduce CO_2 emissions, with preference for rail and sea freight where applicable.

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

Total Weight	149 g

Component (> 1%)	(%)
Steel (combined)	80,04%
Rubber - EPDM	17,12%

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.

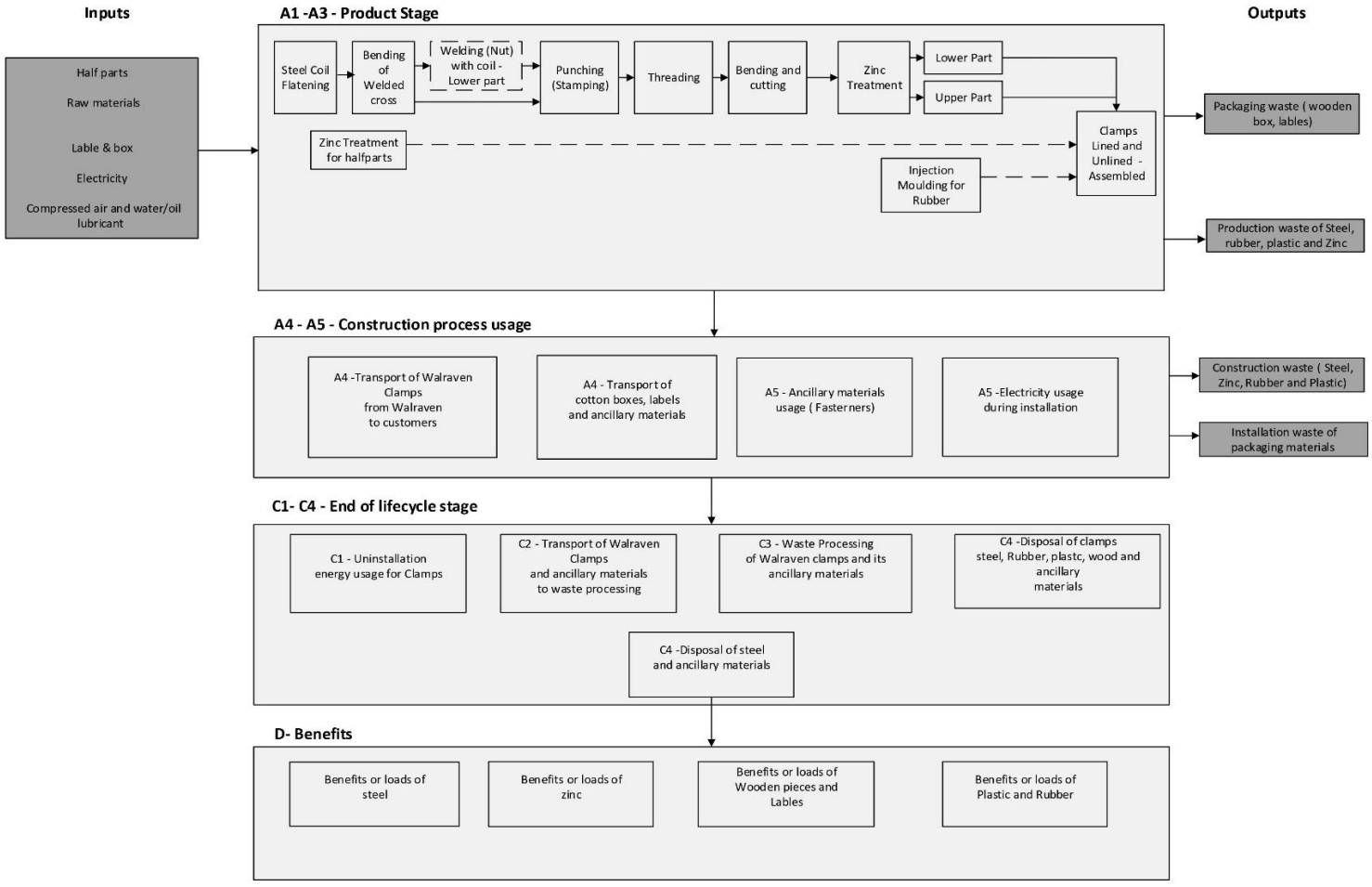
All significant inputs and outputs such as emissions, energy consumption, and material flows are accounted for. Materials representing less than 1% of the product's total weight may be excluded unless they are expected to contribute more than 5% to any environmental impact category. The cumulative environmental 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 EPDM M8 80-83mm. 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 EPDM M8/10 54-58mm
Walraven Bifix® G2 Clamp BUP EPDM M8 54-58mm
Walraven Bifix® G2 Clamp BUP EPDM M10 54-58mm
Walraven Bifix® G2 Clamp BUP EPDM M8/10 60-64mm
Walraven Bifix® G2 Clamp BUP EPDM M8 60-64mm
Walraven Bifix® G2 Clamp BUP EPDM M10 60-64mm
Walraven Bifix® G2 Clamp BUP EPDM M8/10 66-70mm
Walraven Bifix® G2 Clamp BUP EPDM M8 66-70mm
Walraven Bifix® G2 Clamp BUP EPDM M10 66-70mm
Walraven Bifix® G2 Clamp BUP EPDM M8/10 75-79mm
Walraven Bifix® G2 Clamp BUP EPDM M8 75-79mm
Walraven Bifix® G2 Clamp BUP EPDM M10 75-79mm
Walraven Bifix® G2 Clamp BUP EPDM M8/10 80-83mm
Walraven Bifix® G2 Clamp BUP EPDM M8 80-83mm
Walraven Bifix® G2 Clamp BUP EPDM M10 80-83mm

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.	4,17E-03	2,15E-06	4,28E-07	4,17E-03	7,64E-08	1,95E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,78E-07	1,64E-07	2,81E-10	-2,71E-04
ADPF	MJ	7,96E+00	1,29E+00	4,29E-01	1,33E+04	4,57E-02	3,78E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,07E-01	4,92E-02	8,50E-04	-2,33E+00
GWP	kg CO2 eq.	4,78E-01	8,46E-02	2,34E-02	5,86E-01	2,99E-03	2,75E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,98E-03	7,87E-02	3,02E-05	-1,25E-01
ODP	kg CFC11 eq.	4,23E-08	1,50E-08	2,27E-09	5,96E-08	5,31E-10	2,49E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,24E-09	5,25E-10	9,99E-12	-1,22E-08
POCP	kg ethene eq.	4,52E-04	5,13E-05	2,07E-07	5,03E-04	1,80E-06	1,46E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,21E-06	2,79E-06	3,20E-08	-2,20E-04
AP	kg SO2 eq.	2,69E-03	3,80E-04	3,97E-05	3,11E-03	1,32E-05	1,33E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,07E-05	3,51E-05	2,19E-07	-5,26E-04
EP	kg (PO4) 3 eq.	3,78E-04	7,38E-05	7,09E-06	4,59E-04	2,58E-06	2,05E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,03E-06	5,99E-06	4,25E-08	-6,45E-05

Toxicity indicators and ECI (Dutch market)

HTP	kg DCB eq.	8,27E-01	3,57E-02	2,16E-03	8,65E-01	1,26E-03	4,00E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,94E-03	3,67E-03	1,43E-05	-7,32E-02
FAETP	kg DCB eq.	1,41E-02	1,04E-03	8,59E-05	1,53E-02	3,68E-05	7,54E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,58E-05	8,05E-05	7,32E-07	-3,90E-04
MAETP	kg DCB eq.	2,76E+01	3,74E+00	3,41E-01	3,17E+01	1,32E-01	1,53E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,09E-01	3,14E-01	1,21E-03	-1,85E+00
TETP	kg DCB eq.	4,95E-03	1,26E-04	1,82E-04	5,26E-03	4,45E-06	4,59E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,04E-05	1,48E-05	3,58E-08	3,89E-03
ECI	euro	1,18E-01	1,02E-02	1,67E-03	1,30E-01	3,60E-04	5,98E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	8,41E-04	4,50E-03	4,33E-06	-1,61E-02
ADPF	kg Sb eq.	3,83E-03	6,22E-04	2,06E-04	6,41E+00	2,20E-05	1,82E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	5,13E-05	2,37E-05	4,09E-07	-1,12E-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.	4,92E-01	8,54E-02	2,34E-02	6,00E-01	3,02E-03	2,79E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,04E-03	7,66E-02	3,07E-05	-1,31E-01
GWP-fossil	kg CO2 eq.	4,89E-01	8,53E-02	2,34E-02	5,97E-01	3,02E-03	2,77E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,04E-03	7,88E-02	3,07E-05	-1,31E-01
GWP-biogenic	kg CO2 eq.	2,01E-03	3,18E-05	-5,00E-07	2,04E-03	1,13E-06	9,84E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,63E-06	-2,15E-03	1,91E-08	0,00E+00
GWP-luluc	kg CO2 eq.	9,09E-04	3,14E-05	-5,55E-07	9,40E-04	1,11E-06	4,72E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,58E-06	3,50E-06	8,57E-09	-2,87E-06
ODP	kg CFC11 eq.	4,56E-08	1,88E-08	2,47E-09	6,68E-08	6,66E-10	2,82E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,55E-09	5,92E-10	1,26E-11	-1,32E-08
AP	mol H+ eq.	3,30E-03	5,05E-04	5,35E-05	3,86E-03	1,75E-05	1,66E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,08E-05	4,46E-05	2,90E-07	-6,39E-04
EP-fresh water	kg PO4 eq.	3,59E-05	8,58E-07	4,55E-07	3,72E-05	3,04E-08	1,60E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	7,10E-08	2,06E-07	3,47E-10	-5,58E-06
EP-marine	kg N eq.	6,78E-04	1,77E-04	1,09E-05	8,66E-04	6,16E-06	3,93E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,44E-05	1,16E-05	1,00E-07	-1,12E-04
EP-terrestrial	mol N eq.	7,52E-03	1,95E-03	1,65E-04	9,64E-03	6,80E-05	4,35E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,59E-04	1,32E-04	1,11E-06	-1,30E-03
POCP	kg NMVOC eq.	2,50E-03	5,55E-04	2,68E-05	3,08E-03	1,94E-05	1,24E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,53E-05	3,48E-05	3,21E-07	-7,08E-04
ADP-minerals & metals	kg Sb eq.	4,17E-03	2,15E-06	4,28E-07	4,17E-03	7,64E-08	1,95E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,78E-07	1,64E-07	2,81E-10	-2,71E-04
ADP-fossil	MJ, net calorific value	7,36E+00	1,29E+00	3,98E-01	9,05E+00	4,55E-02	3,64E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,06E-01	4,92E-02	8,57E-04	-1,96E+00
WDP	m3 world eq. Deprived	3,12E-01	4,59E-03	5,38E-03	3,22E-01	1,63E-04	1,35E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,80E-04	1,32E-03	3,67E-05	-5,40E-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	3,26E-08	7,64E-09	8,22E-11	4,03E-08	2,71E-10	1,70E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,32E-10	4,73E-10	5,65E-12	-7,76E-09
IRP	kBq U235 eq.	3,21E-02	5,39E-03	6,61E-04	3,81E-02	1,91E-04	1,75E-03	ND	ND	ND	ND	ND	ND	ND	0,00E+00	4,45E-04	2,21E-04	3,55E-06	-3,99E-03
ETP-fw	CTUe	4,84E+01	1,15E+00	2,13E-01	4,98E+01	4,06E-02	2,22E+00	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,47E-02	3,02E-01	7,29E-04	-5,85E+00
HTP-c	CTUh	2,86E-09	3,73E-11	-1,12E-11	2,88E-09	1,32E-12	1,40E-10	ND	ND	ND	ND	ND	ND	ND	0,00E+00	3,07E-12	4,98E-12	1,41E-14	-8,87E-11
HTP-nc	CTUh	4,96E-08	1,25E-09	1,58E-10	5,10E-08	4,44E-11	3,25E-09	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,04E-10	2,45E-10	5,33E-13	1,37E-08
SQP	-	2,56E+00	1,11E+00	5,03E-01	4,18E+00	3,95E-02	1,97E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	9,21E-02	8,06E-02	1,81E-03	-4,51E-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	5,40E-04	3,25E-06	1,56E-06	5,45E-04	1,15E-07	2,51E-05	ND	ND	ND	ND	ND	ND	ND	0,00E+00	2,69E-07	1,78E-07	1,27E-09	-4,34E-05
NHWD	kg	1,25E-01	8,12E-02	7,55E-04	2,07E-01	2,89E-03	1,06E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,73E-03	2,88E-03	5,71E-03	-1,25E-02
RWD	kg	2,85E-05	8,44E-06	6,30E-07	3,76E-05	2,99E-07	1,65E-06	ND	ND	ND	ND	ND	ND	ND	0,00E+00	6,97E-07	2,62E-07	5,63E-09	-5,82E-06
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	1,05E-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	2,42E-02	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	2,03E-01
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	1,18E-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	6,80E-01	1,61E-02	1,58E-01	8,54E-01	5,70E-04	4,02E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,33E-03	6,56E-03	8,94E-06	-5,93E-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	6,80E-01	1,61E-02	1,58E-01	8,54E-01	5,70E-04	4,02E-02	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,33E-03	6,56E-03	8,94E-06	-5,93E-02
PENRE	MJ	7,83E+00	1,36E+00	4,35E-01	9,63E+00	4,83E-02	3,89E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,13E-01	5,24E-02	9,10E-04	-2,08E+00
PENRM	MJ	6,56E-01	0,00E+00	0,00E+00	6,56E-01	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	8,49E+00	1,36E+00	4,35E-01	1,03E+01	4,83E-02	3,89E-01	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,13E-01	5,24E-02	9,10E-04	-2,08E+00
SM	kg	4,76E-02	0,00E+00	4,58E-05	4,77E-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	9,24E-03	1,56E-04	1,77E-04	9,58E-03	5,54E-06	4,17E-04	ND	ND	ND	ND	ND	ND	ND	0,00E+00	1,29E-05	1,16E-04	9,23E-07	-1,37E-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® G2 Clamp BUP EPDM M8 80-83mm 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 Clamps Lined - 80-83 mm 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 represent the upstream and manufacturing phases of the product life cycle. Module A1 includes the extraction and processing of raw materials, as well as ancillary inputs like packaging, water, and lubricants. For the Walraven Bifix® G2 Clamp BUP EPDM M8 80–83mm, modeling is based on the 2023–2024 bill of materials. Key materials include multiple steel grades, POM and PP plastics, EPDM rubber, and zinc. All data is derived from NMD v3.8 and Ecoinvent v3.6. Where primary datasets were unavailable, generic references were applied. Steel inputs follow NMD averages with 57% primary and 43% secondary content..

Module A2 models the transportation of raw materials from suppliers to the Walraven production site in Mijdrecht. Transport distances are based on supplier locations as specified in the bill of materials and are modeled according to EN 15804:2012+A2:2019/AC:2021, using datasets from NMD v3.8 and Ecoinvent v3.6. A 50% load factor is assumed, representing a full truck to the site and an empty return. Representative transport distances include 1,600 km by truck for EPDM rubber, 20,000 km by ship plus 950 km by truck for POM plastic, and 1,600 km by truck for PP plastic. Steel components are depending on the supplier, with an additional 100 km applied for selected steel components sent to the zinc treatment facility. Transport associated with zinc coating processes is modeled over 100 km. 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 includes all processes related to production at the Walraven Mijdrecht facility, including energy use, fuels, auxiliary inputs like lubricants, and production waste. Electricity consumption is divided between the Dutch national grid and on-site solar panels. Additional electricity was required for zinc coating processes. Steel waste generated during production is partially recycled. Allocation of this waste and recycling is done according to the Mijdrecht facility's share of total clamp production. Transport of production waste was included, along with use of lubricating oil in manufacturing processes.Capital goods were excluded from modeling as their impact is below the 5% threshold, in accordance with the cutoff rule in EN 15804+A2.

Module A4 describes the transportation of the final product from Walraven Mijdrecht to the installation site. A default distance of 150 km was applied, based on standard values from the Bepalingsmethode v1.2 (2025), assuming a 50% load factor. Emissions were modeled using the same vrachtwagen (freight truck) reference from NMD v3.8.

Module A5 includes installation-related losses and waste transport. A standard 5% material loss was assumed due to manual installation inefficiencies. No energy was modeled for installation as the process is conducted manually.Steel waste is assumed to be transported 100 km to landfill and Rubber and plastic waste is transported 100 km to incineration (AVI) plants.

End-of-life scenario modeling follows fixed fractions per Bepalingsmethode v1.2 (2025):

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

Module C1 considers the manual deconstruction of the clamp at the end of its service life. No energy use is associated with this stage.

Module C2 models the transport of end-of-life materials to appropriate processing facilities. Steel and zinc are transported 50 km to recycling or landfill sites, while rubber and plastic are transported 100 km to AVI incineration plants. Transport emissions are calculated using the dataset 0001-tra&Transport, vrachtwagen from NMD v3.8 and Ecoinvent v3.6.

Module C3 covers waste treatment. Steel and zinc are assumed to be fully recycled after sorting, whereas plastic and rubber are entirely incinerated with energy recovery at AVI facilities. Emissions are modeled using the references 0264-avC&Verbranden kunststoffen (28.67 MJ/kg) for plastics, 0260-avC&Verbranden rubber/EPDM (27.2 MJ/kg) for rubber, and 0315-reC&Sorteren en persen oud ijzer for steel, all sourced from NMD v3.8 and Ecoinvent v3.6.

Module C4 addresses final disposal. A residual fraction of 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 is credited with a 52% substitution benefit, reflecting a 95% recycling rate offset by 43% secondary content. Zinc is modeled with a 95% recycling benefit. Plastic and rubber incineration at AVI facilities is credited with a 100% energy substitution benefit, representing recovered energy displacing fossil-based electricity.

This assessment follows EN 15804:2012+A2:2019/AC:2021 and Bepalingsmethode v1.2 (2025), using verified datasets from NMD v3.8 and Ecoinvent v3.6. The methodology reflects current Dutch and international best practices for environmental product declarations of construction products.

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

REFERENCES

[1] ISO, ISO 14040: Environmental management – Life cycle assessment – Principles and Framework, ISO 14040:2006 + Amd 1:2020, International Organization for Standardization, 2020.

[2] ISO, ISO 14044: Environmental management – Life cycle assessment – Requirements and guidelines, ISO 14044:2006 + Amd 2:2020, International Organization for Standardization, 2020.

[3] ISO, ISO 14025: Environmental labels and declarations – Type III environmental declarations – Principles and procedures, ISO 14025:2006, International Organization for Standardization, 2006.

[4] European Technical Assessment (ETA) for Walraven Bifix® G2 Clamps, Walraven, Mijdrecht, 2024.

[5] NMD, Bepalingsmethode ‘Milieuprestatie Bouwwerken’ versie 1.2 inclusief de bijbehorende wijzigingsbladen, Nationale Milieudatabase, 2025.

[6] CE Delft, Handboek Schaduwprijzen, 2010. [Online]. Available: https://ce.nl/publicaties/handboek-schaduwprijzen-waardering-en-weging-van-emissies-en-milieueffecten/

[7] TNO, Toxiciteit heeft z'n prijs: schaduwprijzen voor (eco-)toxiciteit en uitputting van abiotische grondstoffen binnen DuboCalc. [Online]. Available: https://puc.overheid.nl/rijkswaterstaat/doc/PUC_119145_31/

[8] NEN, NEN-EN 15804: Duurzaamheid van bouwwerken – Milieuverklaringen van producten – Basisregels voor de productgroep bouwproducten, NEN-EN 15804:2012 + A2:2019 + AC:2021, Nederlands Normalisatie-instituut, 2021.

[9] P. P. Lahoti and V. D. M., Lubrication in cold rolling of steel, Journal of Materials Processing Technology, vol. 209, no. 9, pp. 4638–4642, 2009.

[10] F. G. H. van Wees, J. V. B., J. O. P. R., Energy Consumption for Steel Production, in World Energy Conference, Cannes, Nov. 1986.

[11] The Engineering Toolbox, 2001. [Online]. Available: https://www.engineeringtoolbox.com/

[12] NMD, Environmental Performance Assessment Method for Construction Works, January 2025. [Online]. Available: https://milieudatabase.nl/wp-content/uploads/2022/05/Bepalingsmethode_Milieuprestatie_Bouwwerken_maart_2022_Engels.pdf.