

**Environmental  
Product  
Declaration**

According to EN15804+A2 (+indicators A1)

This declaration is for:

**Walraven Bifix® 1301 Clamp Stainless EPDM M10 40-43mm**

Provided by:

**J. van Walraven Holding B.V.**



MRPI® registration:

**1.1.00926.2025**

Program operator:

**Stichting MRPI®**

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## COMPANY INFORMATION

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## MRPI® REGISTRATION

1.1.00926.2025

## 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 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® 1301 Clamp Stainless EPDM M10 40-43mm

## DECLARED UNIT / FUNCTIONAL UNIT

1 Piece

## DESCRIPTION OF PRODUCT

The Walraven 1301 Stainless M10 EPDM Clamp is a robust two-screw pipe clamp with a quick locking system for efficient installation. Made from high-grade stainless steel 1.4404 (AISI 316L), it features a black EPDM noise-insulating, age-resistant lining that meets DIN 4109 standards. Designed for long-lasting corrosion resistance and reliable vibration damping in demanding environments.

## VISUAL PRODUCT



## MORE INFORMATION

<https://www.walraven.com/int/products/standard-clamps/>

|                                                                        |                                                                                                                       |
|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Ing. L. L. Oosterveen MSc. MBA</b><br><b>Managing Director MRPI</b> | <b>DEMONSTRATION OF VERIFICATION</b>                                                                                  |
|                                                                        | CEN standard EN15804 serves as the core PCR [1]                                                                       |
|                                                                        | Independent verification of the declaration an data according to EN15804+A2 (+indicators A1)<br>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® 1301 Clamp Stainless EPDM M10 40-43mm is a high-quality, corrosion-resistant two-screw pipe clamp designed for secure fastening of pipes in demanding environments. It is constructed from stainless steel 1.4404 (AISI 316L), making it suitable for applications that require long-term durability and exceptional resistance to corrosion. The clamp is fitted with a black EPDM noise-insulating and age-resistant lining that provides vibration damping and noise reduction in accordance with DIN 4109 acoustic standards. An integrated quick locking system ensures efficient installation, supporting both new installations and maintenance work.

### Manufacturing Location

The clamp is manufactured in the Czech Republic using precision engineering processes under strict quality control standards.

### Manufacturing Process Overview

Stainless steel 1.4404 (AISI 316L) is first cut and formed to provide high strength and corrosion resistance. The clamp halves are then shaped with precision stamping and forming tools to ensure dimensional accuracy. Integrated nuts and bolts are pre-installed to facilitate easy assembly. The black EPDM rubber lining is applied to meet DIN 4109 requirements for sound insulation and vibration damping. Finally, the two-screw design with the quick locking mechanism is completed and the clamp is prepared for installation.

### Environmental and Performance Features

The stainless steel construction ensures exceptional corrosion resistance in aggressive environments, including marine and chemical exposure. The EPDM lining reduces structure-borne sound and absorbs vibrations, maintaining its performance over time. The lining is also reliable across a wide range of operating temperatures.

### Installation and Use Phase

The two-screw clamp with a quick locking system allows for fast and secure installation. It is compatible with a wide range of pipe materials, including those in corrosion-sensitive or hygienic environments, and the stainless steel construction minimizes maintenance requirements.

### End-of-Life Considerations

At the end of its life, the stainless steel and EPDM components can be easily separated for recycling. The bolted design supports simple disassembly for efficient material recovery.

### Packaging and Transport

The clamp is delivered in recyclable packaging materials, and transport is optimized to reduce the environmental footprint.

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

|              |      |
|--------------|------|
| Total Weight | 77 g |
|--------------|------|

| Component (> 1%) | (%)    |
|------------------|--------|
| Steel (combined) | 90,37% |
| Rubber - EPDM    | 6,96%  |



## 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.

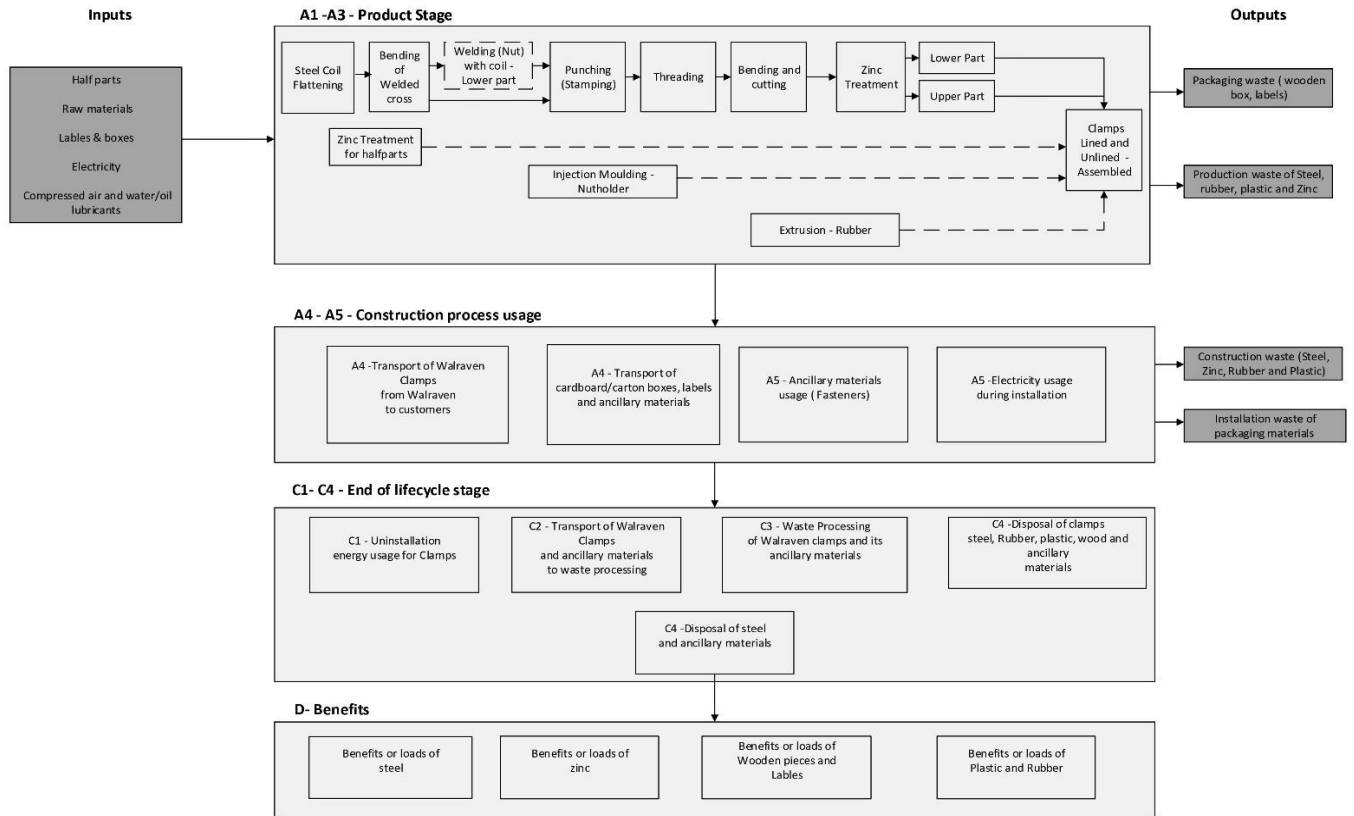
All significant inputs and outputs such as emissions, energy consumption, and material flows are accounted for. Materials representing less than 1% of the product's total weight may be excluded unless they are expected to contribute more than 5% to any environmental impact category. The cumulative environmental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



## REPRESENTATIVENESS

The aggregation was done by choosing the reference product as Walraven Bifix® 1301 Clamp Stainless EPDM M10 40-43mm. The remaining products which are aggregated in the same group by following the 20% allocation and worst-case scenario approach as per EN 15804+A2 and NMD Bepalingsmethode v1.2 (2025) are listed below:

Walraven Bifix® 1301 Clamp Stainless EPDM M10 57-64mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M10 52-56mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M8 57-64mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M10 47-51mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M10 40-43mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M8 52-56mm  
Walraven 2S Clamp set zinc plated EPDM M8/10 75-81mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M10 31-35mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M8 40-43mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M10 25-28mm  
Walraven Aero® Clamp pre-galvanized M8 TPE 150mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M8 31-35mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M8 25-28mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M10 15-19mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M8 11-14mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M8 15-19mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M8 47-51mm  
Walraven 2S Clamp zinc plated EPDM M8/10 82-87mm  
Walraven 2S Clamp set zinc plated EPDM M8 62-67mm  
Walraven 2S Clamp zinc plated EPDM M8/10 75-81mm  
Walraven 2S Clamp zinc plated EPDM M8/10 68-74mm  
Walraven 2S Clamp set zinc plated EPDM M8 53-61mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M10 20-23mm  
Walraven Bifix® 1301 Clamp Stainless EPDM M8 20-23mm  
Walraven 2S Clamp set zinc plated EPDM M8 47-52mm  
Walraven 2S Clamp set zinc plated EPDM M8 38-46mm



## 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.      | 2,63E-03 | 3,33E-07 | 4,33E-06  | 2,63E-03 | 3,95E-08 | 1,31E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 9,22E-08 | 1,89E-07 | 1,76E-10 | -4,00E-06 |
| ADPF | MJ             | 4,39E+00 | 1,99E-01 | 5,67E+00  | 1,03E+01 | 2,36E-02 | 4,73E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,51E-02 | 4,81E-02 | 5,35E-04 | -9,30E-01 |
| GWP  | kg CO2 eq.     | 2,84E-01 | 1,30E-02 | 4,21E-01  | 7,18E-01 | 1,55E-03 | 3,43E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,61E-03 | 2,11E-02 | 1,89E-05 | -5,96E-02 |
| ODP  | kg CFC11 eq.   | 2,24E-08 | 2,31E-09 | 2,37E-08  | 4,85E-08 | 2,74E-10 | 2,30E-09 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,40E-10 | 4,51E-10 | 6,30E-12 | -3,84E-09 |
| POCP | kg ethene eq.  | 2,63E-04 | 7,87E-06 | -1,21E-04 | 1,49E-04 | 9,33E-07 | 1,68E-06 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,18E-06 | 3,02E-06 | 2,01E-08 | -1,22E-04 |
| AP   | kg SO2 eq.     | 1,61E-03 | 5,73E-05 | 1,42E-03  | 3,08E-03 | 6,80E-06 | 1,46E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,59E-05 | 3,46E-05 | 1,38E-07 | -2,15E-04 |
| EP   | kg (PO4) 3 eq. | 2,30E-04 | 1,13E-05 | 3,03E-04  | 5,44E-04 | 1,34E-06 | 2,64E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,12E-06 | 4,77E-06 | 2,67E-08 | -2,56E-05 |

### Toxicity indicators and ECI (Dutch market)

|       |            |          |          |           |          |          |          |          |          |          |          |          |          |          |          |          |          |          |           |
|-------|------------|----------|----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| HTP   | kg DCB eq. | 5,30E-01 | 5,49E-03 | -1,65E-02 | 5,19E-01 | 6,51E-04 | 2,45E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,52E-03 | 4,10E-03 | 8,55E-06 | -3,57E-02 |
| FAETP | kg DCB eq. | 8,89E-03 | 1,60E-04 | 2,02E-03  | 1,11E-02 | 1,90E-05 | 5,76E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 4,43E-05 | 7,85E-05 | 2,03E-07 | 2,99E-04  |
| MAETP | kg DCB eq. | 1,68E+01 | 5,77E-01 | 1,03E+01  | 2,76E+01 | 6,83E-02 | 1,41E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,59E-01 | 3,34E-01 | 7,25E-04 | 1,21E-02  |
| TETP  | kg DCB eq. | 3,26E-03 | 1,94E-05 | 2,03E-03  | 5,32E-03 | 2,30E-06 | 3,98E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,37E-06 | 1,36E-05 | 2,15E-08 | 2,63E-03  |
| ECI   | euro       | 7,38E-02 | 1,57E-03 | 2,94E-02  | 1,05E-01 | 1,86E-04 | 4,98E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 4,35E-04 | 1,65E-03 | 2,67E-06 | -7,44E-03 |
| ADPF  | kg Sb eq.  | 2,11E-03 | 9,59E-05 | 2,73E-03  | 4,93E-03 | 1,14E-05 | 2,27E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,65E-05 | 2,31E-05 | 2,57E-07 | -4,47E-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.              | 2,93E-01 | 1,32E-02 | 4,18E-01 | 7,24E-01 | 1,56E-03 | 3,43E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,64E-03 | 1,92E-02  | 1,93E-05 | -6,34E-02 |
| GWP-fossil            | kg CO2 eq.              | 2,91E-01 | 1,31E-02 | 4,17E-01 | 7,21E-01 | 1,56E-03 | 3,42E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,64E-03 | 2,12E-02  | 1,93E-05 | -6,34E-02 |
| GWP-biogenic          | kg CO2 eq.              | 1,23E-03 | 4,91E-06 | 6,73E-04 | 1,91E-03 | 5,81E-07 | 9,87E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,36E-06 | -2,01E-03 | 1,13E-08 | 0,00E+00  |
| GWP-luluc             | kg CO2 eq.              | 5,95E-04 | 4,82E-06 | 4,35E-04 | 1,03E-03 | 5,71E-07 | 5,37E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,33E-06 | 3,84E-06  | 5,37E-09 | 3,28E-05  |
| ODP                   | kg CFC11 eq.            | 2,33E-08 | 2,90E-09 | 1,85E-08 | 4,48E-08 | 3,44E-10 | 2,13E-09 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 8,03E-10 | 5,21E-10  | 7,93E-12 | -3,80E-09 |
| AP                    | mol H+ eq.              | 1,98E-03 | 7,63E-05 | 1,70E-03 | 3,75E-03 | 9,04E-06 | 1,78E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,11E-05 | 4,34E-05  | 1,83E-07 | -2,62E-04 |
| EP-fresh water        | kg PO4 eq.              | 2,25E-05 | 1,33E-07 | 7,01E-05 | 9,27E-05 | 1,57E-08 | 4,54E-06 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,67E-08 | 2,33E-07  | 2,16E-10 | -2,28E-06 |
| EP-marine             | kg N eq.                | 4,13E-04 | 2,69E-05 | 2,39E-04 | 6,79E-04 | 3,19E-06 | 3,27E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 7,43E-06 | 9,97E-06  | 6,29E-08 | -4,63E-05 |
| EP-terrestrial        | mol N eq.               | 4,57E-03 | 2,96E-04 | 2,91E-03 | 7,78E-03 | 3,51E-05 | 3,73E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 8,19E-05 | 1,15E-04  | 6,93E-07 | -5,40E-04 |
| POCP                  | kg NMVOC eq.            | 1,49E-03 | 8,46E-05 | 3,78E-04 | 1,95E-03 | 1,00E-05 | 8,33E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,34E-05 | 3,12E-05  | 2,01E-07 | -3,51E-04 |
| ADP-minerals & metals | kg Sb eq.               | 2,63E-03 | 3,33E-07 | 4,33E-06 | 2,63E-03 | 3,95E-08 | 1,31E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 9,22E-08 | 1,89E-07  | 1,76E-10 | -4,00E-06 |
| ADP-fossil            | MJ, net calorific value | 4,02E+00 | 1,98E-01 | 6,13E+00 | 1,03E+01 | 2,35E-02 | 4,90E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,49E-02 | 4,91E-02  | 5,39E-04 | -6,69E-01 |
| WDP                   | m3 world eq. Deprived   | 1,84E-01 | 7,09E-04 | 9,11E-02 | 2,76E-01 | 8,41E-05 | 1,30E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,96E-04 | 6,78E-04  | 2,41E-05 | -1,69E-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 incidence | 1,93E-08 | 1,18E-09 | -6,73E-09 | 1,38E-08 | 1,40E-10 | 5,51E-10 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,27E-10 | 5,24E-10 | 3,55E-12 | -3,75E-09 |
| IRP    | kBq U235 eq.      | 1,86E-02 | 8,31E-04 | 3,45E-02  | 5,39E-02 | 9,85E-05 | 2,72E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,30E-04 | 2,39E-04 | 2,21E-06 | -9,72E-05 |
| ETP-fw | CTUe              | 3,04E+01 | 1,77E-01 | 3,17E-01  | 3,09E+01 | 2,10E-02 | 1,46E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 4,89E-02 | 2,29E-01 | 3,49E-04 | -2,01E+00 |
| HTP-c  | CTUh              | 1,84E-09 | 5,74E-12 | -5,83E-10 | 1,27E-09 | 6,80E-13 | 6,31E-11 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,59E-12 | 5,07E-12 | 8,08E-15 | -1,21E-11 |
| HTP-nc | CTUh              | 3,17E-08 | 1,93E-10 | 1,62E-10  | 3,20E-08 | 2,29E-11 | 2,14E-09 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,35E-11 | 2,44E-10 | 2,48E-13 | 1,04E-08  |
| SQP    | -                 | 1,50E+00 | 1,72E-01 | 1,67E+00  | 3,34E+00 | 2,04E-02 | 1,68E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 4,76E-02 | 9,47E-02 | 1,13E-03 | -1,43E-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   | 3,42E-04 | 5,03E-07 | -7,74E-06 | 3,35E-04 | 5,96E-08 | 1,64E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 1,39E-07 | 1,55E-07 | 8,05E-10 | -6,66E-06 |
| NHWD | kg   | 7,88E-02 | 1,26E-02 | 3,37E-02  | 1,25E-01 | 1,49E-03 | 6,47E-03 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,48E-03 | 1,78E-03 | 3,66E-03 | -6,03E-03 |
| RWD  | kg   | 1,55E-05 | 1,30E-06 | 2,89E-05  | 4,57E-05 | 1,54E-07 | 2,27E-06 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,60E-07 | 2,84E-07 | 3,54E-09 | -9,97E-07 |
| CRU  | kg   | 0,00E+00 | 0,00E+00 | 0,00E+00  | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 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 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,95E-02 | 0,00E+00 | 0,00E+00  |
| MER  | kg   | 0,00E+00 | 0,00E+00 | 1,60E-05  | 1,60E-05 | 0,00E+00 | 8,01E-07 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,64E-03 | 0,00E+00  |
| EEE  | MJ   | 0,00E+00 | 0,00E+00 | 5,37E-04  | 5,37E-04 | 0,00E+00 | 2,68E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 2,76E-02  |
| ETE  | MJ   | 0,00E+00 | 0,00E+00 | 9,23E-04  | 9,23E-04 | 0,00E+00 | 4,61E-05 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 4,76E-02  |

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   | 4,14E-01 | 2,48E-03 | 6,87E-01 | 1,10E+00 | 2,94E-04 | 5,55E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,87E-04 | 7,43E-03 | 4,35E-06 | -2,36E-03 |
| PERM  | MJ   | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| PERT  | MJ   | 4,14E-01 | 2,48E-03 | 6,87E-01 | 1,10E+00 | 2,94E-04 | 5,55E-02 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,87E-04 | 7,43E-03 | 4,35E-06 | -2,36E-03 |
| PENRE | MJ   | 4,27E+00 | 2,11E-01 | 6,61E+00 | 1,11E+01 | 2,50E-02 | 5,26E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,82E-02 | 5,21E-02 | 5,72E-04 | -7,02E-01 |
| PENRM | MJ   | 1,53E-01 | 0,00E+00 | 0,00E+00 | 1,53E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| PENRT | MJ   | 4,12E+00 | 2,11E-01 | 6,61E+00 | 1,09E+01 | 2,50E-02 | 5,26E-01 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5,82E-02 | 5,21E-02 | 5,72E-04 | -7,02E-01 |
| SM    | kg   | 3,15E-02 | 0,00E+00 | 7,72E-05 | 3,15E-02 | 0,00E+00 | 3,86E-06 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 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 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 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 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00  |
| FW    | m3   | 5,53E-03 | 2,42E-05 | 1,14E-02 | 1,69E-02 | 2,86E-06 | 8,30E-04 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 6,68E-06 | 4,50E-05 | 5,75E-07 | -3,76E-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 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 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 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 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.

For Module A1, specific data for product composition was provided by the manufacturer. For Module A2, transportation data of raw materials to the production site was collected. For Module A3, energy consumption and waste data were recorded for the production year 2023/2024. Background data is sourced from the Dutch Nationale Milieudatabase v3.8 and is based on Ecoinvent 3.6.

### Data Collection Period:

The dataset is representative for the production processes used in 2023/2024.

### Methodology and Reproducibility:

The LCA is developed in accordance with EN15804+A2:2019, NEN-EN ISO 14040, 14044, and 14025, and follows the requirements of the NMD Bepalingsmethode v1.2 (2025). Calculations were performed using Ecochain Helix software version 4.3.1.

The life cycle stages included in this draft EPD are:

A1–A3: Raw material supply, transport, manufacturing

A4–A5: Transport to site and installation

B1–B7: Use stage (if applicable)

C1–C4: End-of-life processing

D: Benefits and loads beyond the system boundary (e.g., recycling credits).

### Inventory and Allocation:

This section outlines the quantity, quality, and allocation of materials, energy flows, and emissions across relevant life cycle stages. System boundaries are defined using the modular approach as described in EN15804+A2 and the NMD Bepalingsmethode v1.2 (2025).

All manufacturing inputs were assigned to production processes and distributed to products using mass-based allocation. No secondary materials were used in the production phase. End-of-life assumptions follow standard treatment and recovery scenarios in the Dutch context. Cut-off criteria were applied to ensure that no more than 5% of mass or energy flows were excluded.

### Data Sources:

Primary data was collected from Walraven's Czech Republic production site, including material composition, energy usage, transport distances, and waste outputs. Where supplier-specific data was unavailable, standard reference data for stainless steel, rubber, and coating materials were selected from Ecoinvent 3.6 and the Nationale Milieudatabase v3.8.

## SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION (PART 1)

### Modules A1–A3 – Raw Material Supply and Manufacturing

Modules A1 to A3 cover the initial life cycle stages of the stainless steel clamp. Module A1 models the extraction and processing of raw and auxiliary materials, including packaging and lubricants. The 2023/2024 bill of materials forms the basis for all material modeling. Primary materials include stainless steel, EPDM rubber lining, and a PA6 plastic insert. These components were modeled using generic datasets from the Nationale Milieudatabase (NMD) v3.8 and Ecoinvent v3.6. Stainless steel is modeled according to standard market composition of primary and secondary content, following Dutch average market assumptions. Module A2 addresses transportation of raw materials to the Walraven Czech Republic manufacturing site. Transport distances for each material were determined based on supplier logistics and modeled in compliance with EN 15804+A2:2019 using Ecoinvent 3.6 and NMD 3.8 references. A 50% load factor is assumed for all truck transport, with fully loaded deliveries to the site and empty returns, while international shipping is also considered. Module A3 represents the production stage, including electricity consumption from the grid and renewable sources, fuel and lubricating oil use, packaging materials, and waste generation such as steel scrap and EPDM offcuts. Production processes and related emissions were modeled based on primary operational data from 2023/2024. Internal recycling of stainless steel waste was incorporated proportionally to the facility's production share, and transport of waste to appropriate treatment or recycling sites was accounted for. Capital goods were excluded following the EN 15804+A2 cutoff rule, as their contribution remained below 5% of total environmental impact.

### Module A4 – Transport to Installation Site

Module A4 models the transport of the final product from the production facility to customer installation sites. A standardized distance of 150 km is applied in accordance with Bepalingsmethode v1.2 (2025). Emissions were calculated using the 0001-tra&Transport, vrachtwagen dataset from NMD v3.8 and Ecoinvent v3.6, with a 50% transport load assumption.

### Module A5 – Installation

Module A5 addresses the installation phase, assuming a 5% material loss during manual installation. No energy consumption is modeled as installation is non-mechanized. Transport of installation waste is included, with steel sent 100 km to landfill or recycling, and rubber and plastic sent 100 km to AVI incineration. All assumptions are in accordance with Bepalingsmethode v1.2 (2025), and material losses and waste flows were modeled per individual clamp.

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

## SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION (PART 2)

### Module C1 – Deconstruction

Module C1 reflects the manual deconstruction phase of the clamp at the end of its service life. This process is manual and does not require any energy input, so no energy consumption is modeled for this stage.

### Module C2 – Transport to Waste Processing Facilities

Module C2 covers the transport of deconstructed materials to appropriate waste processing facilities. Stainless steel is transported 50 km to recycling sites, while rubber and PA6 plastic are transported 100 km to AVI incineration plants. All transport modeling is based on the 0001-tra&Transport, vrachtwagen dataset from NMD v3.8 and Ecoinvent v3.6.

### Module C3 – Waste Processing

Module C3 models the processing of end-of-life materials. Stainless steel is 100% sorted and recycled, while rubber and PA6 plastic are incinerated with energy recovery at AVI facilities. Emission factors used for modeling include 0260-avC&Verbranden rubber/EPDM (27.2 MJ/kg) for rubber, 0264-avC&Verbranden kunststoffen (28.67 MJ/kg) for plastics, and 0315-reC&Sorteren en persen oud ijzer for steel. All datasets are sourced from NMD v3.8 and Ecoinvent v3.6.

### Module C4 – Final Disposal

Module C4 accounts for the final disposal of residues. A residual 5% of stainless steel is sent to landfill, modeled using 0253-sto&Stort staal. Rubber and plastic are fully incinerated, and no portion is landfilled.

### Module D – Benefits Beyond the System Boundary

Module D captures environmental credits beyond the product's life cycle. Steel recycling provides a 52% substitution benefit, calculated as the 95% recycling rate minus the 43% secondary input. Rubber and plastic incineration is assumed to yield 100% energy recovery, displacing fossil-based energy.

This environmental product declaration is fully compliant with EN 15804+A2:2019/AC:2021 and follows the Dutch regulatory method Bepalingsmethode v1.2 (2025). Material flows, energy use, waste, and end-of-life treatments were modeled using primary production data and internationally recognized datasets from Ecoinvent 3.6 and NMD v3.8.

## 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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