

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A1

Owner of the Declaration	NedZink B.V.
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-NED-20200254-IBC1-EN
Issue date	15-6-2021
Valid to	14-6-2026

**NedZink NOVA, NedZink NEO, NedZink NOIR
NedZink B.V.**

www.ibu-epd.com | <https://epd-online.com>



1. General Information

NedZink B.V.

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Declaration number

EPD-NED-20200254-IBC1-EN

This declaration is based on the product category rules:

Building metals, 11.2017
(PCR checked and approved by the SVR)

Issue date

15-6-2021

Valid to

14-6-2026

Dipl. Ing. Hans Peters
(chairman of Institut Bauen und Umwelt e.V.)

Dr. Alexander Röder
(Managing Director Institut Bauen und Umwelt e.V.)

NedZink® NOVA / NedZink® NEO / NedZink® NOIR

Owner of the declaration

NedZink B.V.
Hoofdstraat 1
6024 AA, Budel-Dorplein
Netherlands

Declared product / declared unit

1kg NedZink® NOVA/NedZink® NEO/NedZink® NOIR,
pre-weathered titanium zinc

Scope:

The Life Cycle Assessment (LCA) was carried out according to *ISO 14040*, *ISO 14044* and *EN 15804*. The LCA is performed for the pre-weathered products NedZink® NOVA/NedZink® NEO/NedZink® NOIR manufactured by NedZink B.V. in Budel-Dorplein, Netherlands.

The pre-weathered rolled zinc from NedZink covered by this EPD can be used in buildings as roof, façade or rainwater systems.

The LCA was carried out for the manufacturing phase of the declared product, containing information on raw and secondary material production, transport and packaging (cradle to gate). Possible credits after the end of life phase (module D), waste disposal (C4) and transport to waste disposal (C2) are also included.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of *EN 15804+A1*. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard *EN 15804* serves as the core PCR
Independent verification of the declaration and data
according to *ISO 14025:2010*

internally externally

Mr Olivier Muller
(Independent verifier)

2. Product

2.1 Product description/Product definition

NedZink® NOVA / NedZink® NEO / NedZink® NOIR is pre-weathered titanium zinc produced by NedZink according to *EN 988*.

Small quantities, as specified in *EN 988*, of the alloy elements copper, titanium and aluminium are added to electrolytically refined zinc (with a purity of min. 99,995% Zn, Z1 according to *EN 1179*).

The chemical composition, mechanical and physical properties and measurement tolerances are determined in the *KOMO product certificate* and certified as NedZink NTZ® by *Lloyd's Register Product certificate (approval No QIS 122)*.

The defined material properties are checked by an independent and neutral research institute. This product certification and the *ISO 9001* certificate for the quality management system at NedZink assure a constant and uniform high quality standard.

NedZink® NOVA is pre-weathered titanium zinc in a matt natural medium grey color. NedZink® NEO is pre-weathered titanium zinc in a matt natural mineral grey color. NedZink® NOIR is pre-weathered titanium zinc in an anthracite black color.

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a Declaration of Performance taking into consideration EN 14782:2006, Self-supporting metal sheet for roofing, external cladding and internal lining, or EN 14783:2013, Fully supported metal sheet and strip for roofing, external cladding and internal lining, and the CE-marking.

For the application and use the respective national provisions apply.

2.2 Application

NedZink® NOVA / NedZink® NEO / NedZink® NOIR titanium zinc coils, sheets, strips and profiles are used for:

- roof and façade cladding (CE-marked based on EN14782:2006, Self-supporting metal sheet for roofing, external cladding and internal lining or EN14783:2013, Fully supported metal sheet and strip for roofing, external cladding and internal lining)
- interior use
- roof drainage systems (gutters, downpipes and accessories according to EN612)
- ornaments

2.3 Technical Data

The main constructional data are presented in the following table:

Constructional data

Name	Value	Unit
Coefficient of thermal expansion	22	10 ⁻⁶ K ⁻¹
Tensile strength	≥ 150	N/mm ²
Compressive strength	not relevant	N/mm ²
Modulus of elasticity	≥ 80000	N/mm ²
Melting point	420	°C
Thermal conductivity	110	W/(mK)
Electrical conductivity at 20°C	17000000	Ω ⁻¹ m ⁻¹
Density	7200	kg/m ³

Required testing standards are described in EN 988.

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to EN 14782 and EN 14783 respectively.

2.4 Delivery status

NedZink material is delivered in thicknesses from 0.5 to 1.5 mm. As average production data is considered, the LCIA results reflect the environmental profile of weighted average product thickness: 0.750 mm. The maximum width of sheets, coils and strips is 1000 mm.

The standard sheets are delivered in 1000 x 2000 mm, 1000 x 2250 mm and 1000 x 3000 mm.

Finished products are delivered to customer specification.

Application rules:

EN988:1996, Zinc and zinc alloys - Specifications for rolled flat products for buildings

EN612:2005, Eaves gutters with bead stiffened fronts and rainwater pipes with seamed joints made of metal sheet.

2.5 Base materials/Ancillary materials

Components of NedZink alloy

The composition of pre-weathered rolled zinc from NedZink is in accordance with EN988:

- Special-High-Grade zinc 99.995% (Z1 according to EN 1179)

- Copper: 0.08 - 0.17%

- Titanium: 0.07 - 0.12%

- Aluminium: ≤ 0.015%

Auxiliary substances

Lubricant oil: 0.89 kg/t zinc; a number of different agents for cleaning, activating and phosphating; temporary protection: 1 - 1.5 µm thickness

None of the components included in the final product is listed in the Candidate List of Substances of Very High Concern for Authorisation (SVHC) dated 01/2018.

The product does not contain substances with carcinogenic mutagenic reprotoxic (CMR) properties >0.1%.

2.6 Manufacture

The manufacturing process of pre-weathered rolled zinc includes the following steps:

Pre-alloy:

In order to improve the properties of zinc, and for energy saving purposes, a pre-alloy with titanium, copper and aluminium is prepared in an induction furnace. This pre-alloy is poured into ingots.

Melting:

In the melting furnace the Special High Grade (SHG) zinc and the ingots are mixed homogeneously. Zinc with the right composition is pumped to the casting furnace.

Casting:

Casting takes place from the casting furnace into a vertical casting installation. The zinc is cast into blocks, cooled down with a closed water system and stored for further processing.

Rolling and coiling:

Blocks coming from the casting installation are homogeneous pre-heated for the "hot rolling" process. This takes place in a gas-fired continuous oven.

During the hot rolling on a reversible rolling machine the blocks are processed to a predefined thickness. At the end of the rolling installation the zinc is coiled and stored to cool off.

On the reversible cold-rolling mill the coils are rolled to the desired final thickness. For cooling and lubrication of the process a special emulsion is used

Stretching and cutting:

Tension in the coils is released by a stretching-and straightening process. The zinc is uniquely marked and slitted and cut to the desired width and length.

Pre-weathering:

In a continuously operating production line the coils are degreased, brushed and phosphated to get a prepatinated medium grey appearance for NedZink® NOVA or a mineral grey appearance for NedZink® NEO.

With an additional process for NedZink® NOIR an anthracite black appearance is created. After rinsing and drying the material surface is provided with a thin transparent protection layer and stored in the warehouse.

Quality control:

During the entire process extensive quality checks are conducted by the manufacturer and *Lloyd's Register*. Quality Management according to *ISO 9001*. Product quality is checked by Lloyd's Register and approved with an Industrial Quality Scheme Approval Certificate *Q/IS122*.

Additionally the quality control is audited by Kiwa and certified with *KOMO product certificates*:

- BRL2034, K7054/04 zinc sheets
- BRL2035, K7057/04 zinc gutters
- BRL2044, K7063/04 zinc downpipes

2.7 Environment and health during manufacturing

The manufacturing process is carried out according to the rules as laid down in the environmental permit. NedZink's policy follows the Total Quality Management (TQM).

The directives of the Environmental Management System *ISO14001* are an integral part of the Quality Management System *ISO9001*.

2.8 Product processing/Installation

Basic principles:

NedZink material must be stored under dry and ventilated conditions. This applies storage in warehouses, on building sites, on installation sites as well as during transportation. Coils are to be stored on their original pallets.

Transportation should only be done in enclosed vehicles.

Temperature deviations have to be avoided as it can result in varying humidity levels.

All contact between zinc and moisture (wet surface, rain or dew) during handling and transportation must be avoided. Wet surfaces (with or without protective film) may not directly be covered.

The material is to be processed without tension.

The thermal expansion has to be taken into account when installing/handling the product.

Mechanical deformation of zinc should be avoided in case the zinc temperature is not at least 7°C.

Further installation rules are listed on www.nedzink.com.

2.9 Packaging

The packaging material in use are wooden pallets, paper/cardboard and plastics (films and wires). All packaging materials are reusable and/or recyclable, if gathered separately.

The take-back and recycling of our packaging in Germany is organized by Interseroh.

2.10 Condition of use

NedZink material develops a protective patina layer, which darkens the material slightly over time due to a reaction with oxygen and carbon dioxide (air and water).

This layer is responsible for the high resistance of titanium zinc against corrosion. For both pre-weathered zinc and natural rolled zinc this behavior is the same.

Zinc in contact with air creates a zinc-oxide. Due to the

influence of water a zinc-hydroxide is developed. In the final step a reaction with carbon dioxide creates a non-water-soluble coating of basic zinc carbonate, being the patina.

Therefore NedZink material does not require any maintenance and cleaning during the period of use. If the surface is slightly damaged, this naturally formed patina layer will heal itself.

NedZink material is UV-resistant, non-flammable and resistant to radiating heat. Direct contact with chemical substances, especially those containing acids, has to be avoided. A list of substances to be avoided can be found on www.nedzink.com.

The material has a repellent effect to electrosmog (electromagnetic radiation) and the effects of rain and snow may be neglected.

2.11 Environment and health during use

Environment

The due to air and water formed patina (zinc carbonate) is a natural protection layer. Due to this patina the transfer of zinc ions via rain water is constantly reduced, because this protection layer is non-water-soluble.

Further transfer of zinc ions is mainly related to the air pollution with SO₂. Due to the reduction of SO₂ concentration in the air, the zinc-concentration of precipitation in the rainwater has subsequently been reduced to one fifth of the former values during the last thirty years.

As a result of all environmental regulations this amount will reduce even more in the future, due to the reduction of SO₂ concentration in the air.

The transfer of zinc ions via rain water is constantly reduced due to developing a natural protection layer of zinc carbonate.

In aquatic systems only a small part of the total zinc concentration is available for organisms (bioavailable). It is related to the physical-chemical conditions of the receiving water body.

Health

When used according to their designated function, NedZink products will have no health effects.

Zinc is an essential metal, necessary for living organisms. Zinc does not accumulate in the body.

The recommended daily intake of zinc (in the correct form) according to the WHO 15mg/day for men and 12mg/day for women.

2.12 Reference service life

The service life depends on the correct application according to the guidelines for processing and installation. The theoretical lifetime according to the available literature is > 100 years.

Service lifetime according to Bundesinstitut für Bau-Stadt- und Raumforschung (BBSR): > 50 years.

As the EPD scope is a cradle-to-gate with options, no reference service life is declared in the LCA.

The standard *ISO 15686* has not been considered.

2.13 Extraordinary effects

Fire

The NedZink® products comply with *EN13501-1*: the requirements of building material Class A1 "non-combustible". (*96/603/EC*)

Fire protection

Name	Value
Building material class EN13501 DIN4102	A1
Burning droplets EN13501	D0
Smoke gas development EN13501	-

Smoke production

Vaporization as zinc oxide (ZnO) occurs when heated above 650 °C. The produced ZnO smoke may cause zinc fever (diarrhoea, dry throat, feverish) when inhaled over some (period of) time. The effects disappear completely in 1 to 2 days after the inhalation.

Water

Zinc is not classified as hazardous for the aquatic environment.

Mechanical destruction

Given the metallic nature of the product, there will be no environmental effect.

2.14 Re-use phase

Disassembly:

During disassembly of a building construction or renovations NedZink material should be separated

from other materials. Zinc can then easily be collected for re-use and/or recycling.

Re-use/Recycling:

Scrap produced during the manufacturing process from NedZink material are 100% remelted and fed back completely into NedZink's production process. A small amount of residue (skimmings, dross, dust), which is no longer valuable for the internal production process, is completely recycled by a third party (European Waste Code 10.05.01).

The scrap from demolition and renovation work on building sites is collected and sold either directly to secondary smelting works or via a scrap metal dealer. The recycling rate for zinc sheets is over 95%. Credits for this recycling are appointed in module D. These credits are based on a recycling percentage of 95% (European recycling rate for rolled zinc).

2.15 Disposal

Due to the effective recycling process, a maximum of 5% zinc has to be disposed.

The European Waste Code for collected zinc after disassembly is 17.04.04.

2.16 Further information

Additional information, optional details, references, data sheets can be obtained at: www.nedzink.com

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is 1 kg of NedZink® NOVA / NedZink® NEO / NedZink® NOIR, pre-weathered titanium zinc.

Declared unit

Name	Value	Unit
Declared unit	1	kg
conversion factor [Mass/Declared Unit]	1	-
Gross density	7200	kg/m ³

3.2 System boundary

Type of the EPD: Cradle-to-Gate with options. Modules A1, A2 and A3 contain information on the raw- and secondary material extraction, transport to the manufacturer, manufacturing and packaging. Only the transport to module C4 is considered under module C2. Module C4 takes into account the non-recovered zinc at the end of life. Modules A4, A5, B1-B7, C1 and C3 are not declared. Credits after End-of-Life of the product are also included (module D).

3.3 Estimates and assumptions

No major estimates or assumptions were required for the creation of this EPD.

3.4 Cut-off criteria

No major cut-offs were applied to specific manufacturing data from Nedzink. Production impacts of packaging for raw materials are not known and excluded, waste processing of this packaging is known and included. For upstream data a background database (*Ecoinvent V3.6*) was used, which can contain additional cut-offs.

3.5 Background data

Background processes are taken from the *Ecoinvent V3.6* database, (2019), with the "allocation, cut-off by classification" system model.

Life cycle inventory data for the production of zinc concentrate and SHG Zinc in the *Ecoinvent V3.6* database is updated with the most recent LCA report (*Zinc Environmental Profile - 2015 Update*) on primary Zinc by the International Zinc Association.

The environmental impact of the SHG Zinc was then calculated using *SimaPro V9.0*. Site-specific data was provided by NedZink and verified against earlier studies.

3.6 Data quality

The data used for this study was both of high quality and recent. The specific data was collected by the manufacturer, The generic data that is used is less than 10 years old or has been updated within this period. This is in compliance with the data quality requirements of *EN 15804*.

3.7 Period under review

Site-specific data for the year 2019 and 2020 was used in this study. Background data is taken from the *Ecoinvent V3.6* database (2019) and varies in age.

3.8 Allocation

Allocation was avoided as much as possible in this study, as required in *EN 15804*.

However, the following allocation had to be done:
 - For pre-weathered zinc, there is a net output stream of rejected zinc product to internal recycling. As this is an internal recycling process, 0 impacts are allocated to this material flow.

3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building

context, respectively the product-specific characteristics of performance, are taken into account.

4. LCA: Scenarios and additional technical information

Modules A4, A5, B1-B7 C1 and C3 are not considered in this study. The possible credits given in Module D are based on 100% recyclability of zinc products. After the collection (a collection rate of 95% is taken), zinc scrap is re-melted and converted to secondary zinc. This is not done by NedZink but by third parties. The possible credit for the zinc gained through re-melting is calculated using the dataset of the primary zinc production. The remaining zinc (5%) is landfilled (module C4).

End of life (C4) / Recycling potentials (D)

Name	Value	Unit
Recycling	95%	kg
Landfilling	5%	kg

5. LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the 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	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	MND	X	MND	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 kg NEDZINK NOVA/NEO/NOIR

Parameter	Unit	A1-A3	C2	C4	D
Global warming potential	[kg CO ₂ -Eq.]	4.53E+0	6.52E-4	2.58E-4	-2.77E+0
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	3.59E-7	1.21E-10	8.61E-11	-2.07E-7
Acidification potential of land and water	[kg SO ₂ -Eq.]	3.58E-2	2.81E-6	1.89E-6	-2.22E-2
Eutrophication potential	[kg (PO ₄) ³ -Eq.]	4.55E-3	5.18E-7	3.33E-7	-3.18E-3
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	1.28E-3	9.39E-8	7.92E-8	-7.24E-4
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	9.30E-2	1.70E-8	2.41E-9	-7.32E-2
Abiotic depletion potential for fossil resources	[MJ]	5.29E+1	9.89E-3	7.28E-3	-3.10E+1

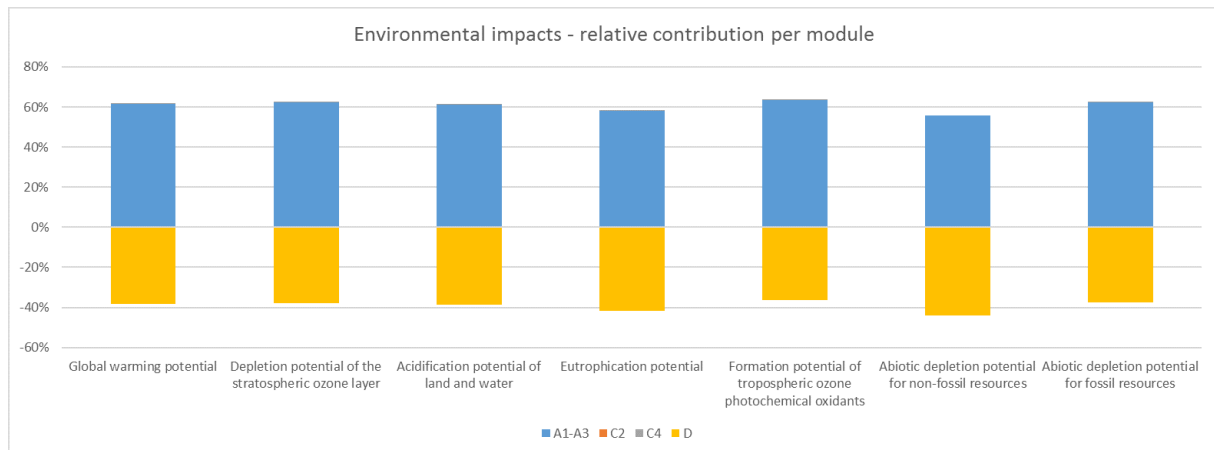
RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A1: 1 kg NEDZINK NOVA/NEO/NOIR

Parameter	Unit	A1-A3	C2	C4	D
Renewable primary energy as energy carrier	[MJ]	8.73E+0	1.45E-4	5.95E-5	-5.62E+0
Renewable primary energy resources as material utilization	[MJ]	2.01E-1	0.00E+0	0.00E+0	0.00E+0
Total use of renewable primary energy resources	[MJ]	8.93E+0	1.45E-4	5.95E-5	-5.62E+0
Non-renewable primary energy as energy carrier	[MJ]	7.14E+1	1.07E-2	7.82E-3	-4.40E+1
Non-renewable primary energy as material utilization	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total use of non-renewable primary energy resources	[MJ]	7.14E+1	1.07E-2	7.82E-3	-4.40E+1
Use of secondary material	[kg]	0.00E+0	0.00E+0	0.00E+0	9.47E-1
Use of renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of non-renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of net fresh water	[m ³]	1.20E-1	1.14E-6	7.86E-6	-8.95E-2

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A1: 1 kg NEDZINK NOVA/NEO/NOIR

Parameter	Unit	A1-A3	C2	C4	D
Hazardous waste disposed	[kg]	1.18E-2	2.58E-8	1.10E-8	-9.46E-3
Non-hazardous waste disposed	[kg]	6.39E-1	6.26E-4	5.00E-2	-4.08E-1
Radioactive waste disposed	[kg]	3.06E-4	6.87E-8	4.83E-8	-2.14E-4
Components for re-use	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	[kg]	1.88E-1	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported electrical energy	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported thermal energy	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0

6. LCA: Interpretation



The 7 main impact categories for 1 kg of Nedzink Nova, Neo, Noir

Life cycle inventory data for the production of zinc concentrate and Special High Grade Zinc (SHG Zinc) in the background database *Ecoinvent V3.6* is aligned with data from the IZA 2015 LCA report (*Zinc Environmental Profile - 2015 Update*, see also section 3.5 Background Data).

The contribution of SHG Zinc is the dominating factor in all of the impact categories, with contributions >70% in for all indicators.

The remaining contributions mainly consist of energy usage (electricity and gas), substances used for pre-weathering and a small contribution from the remaining metal components (Cu, Ti, Al).

Because of the high contribution of SHG Zinc and the high recyclability that is assumed, the amount of credits gained in module D for each impact category is high, at least 57% or higher compared to the initial impact value.

7. Requisite evidence

In a literature study *TNO-MEP-99/441* of TNO (Dutch Organisation for Applied Scientific Research) the emissions from corrosion of zinc to water have been evaluated. This corrosion rate refers to the loss of metallic zinc.

The run-off rate is the wash-off of zinc from the patina layer. This run-off rate is generally lower than the corrosion rate.

During the built up of the zinc patina layer the run-off is lower than the corrosion rate. The growth of the patina layer delays the corrosion.

The run-off rate is influenced by the atmospheric conditions, of which the SO₂ concentration is the most important variable. With the decreasing of the SO₂ concentration, the corrosion rate is also decreasing.

In areas with higher SO₂-concentration a run-off rate off 3 g/m².yr can be calculated and 2 g/m².yr in areas with lower concentration.

8. References

General Programme Instructions

Institut Bauen und Umwelt e.V., Berlin (pub.): The preparation of environmental product declarations (EPDs); General Programme Instructions for the preparation of EPDs at the Institut Bauen und Umwelt e.V. (IBU), 2016/03 www.ibu-epd.com

PCR 2017 Part A

Institut Bauen und Umwelt e.V., Berlin: Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. Version 1.8, July 2019 www.ibu-epd.com

PCR 2017 Part B

Institut Bauen und Umwelt e.V., Berlin: Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part B: Requirements on the EPD for Building Metals. Version 1.6, November 2017 www.ibu-epd.com

EN 988

EN 988:1996
Zinc and zinc alloys - Specification for rolled flat products for building

EN 1179

EN 1179:2003
Zinc and zinc alloys - Primary zinc

EN 612

EN 612:2005

Eaves gutters with bead stiffened fronts and rainwater pipes with seamed joints made of metal sheet

EN 13501-1

EN 13501-1:2007+A1:2009

Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests

EN 13501-5

EN 13501-5:2006+A1:2009

Fire classification of construction products and building elements - Part 5: Classification using data from external fire exposure to roofs tests

EN 14782

EN 14782:2006

Self-supporting metal sheet for roofing, external cladding and internal lining - Product specification and requirements

EN 14783

EN 14783:2013

Fully supported metal sheet and strip for roofing, external cladding and internal lining - Product specification and requirements

EN 15804

EN 15804:2012-04+A1:2013

Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products

DIN 4102

DIN 4102

Fire behaviour of building materials and building components

ISO 9001

ISO 9001:2015

Quality management systems - Requirements

ISO 14001

ISO 14001:2015

Environmental management systems - Requirements with guidance for use

ISO 14025

ISO 14025:2011-10

Environmental labels and declarations - Type III environmental declarations - Principles and procedures

ISO 14040

ISO 14040:2006

Environmental management - Life cycle assessment - Principles and framework

ISO 14044

ISO 14044:2006

Environmental management - Life cycle assessment - Requirements and guidelines

ISO 15686

ISO 15686

Buildings and constructed assets - Service life planning

96/603/EC

EU Commission Decision of 4 October 1996 establishing the list of products belonging to Classes A 'No contribution to fire' provided for in Decision 94/611/EC implementing Article 20 of Council Directive 89/106/EEC on construction products (Text with EEA relevance)

KOMO product certificates

BRL2034: K7054/04 zinc sheets

BRL2035: K7057/04 zinc gutters

BRL2044: K7063/04 zinc downpipes

Lloyd's Register Product certificate (approval No QIS 122)

Lloyd's Register Inspection Services - Product certificate Industrial Quality Scheme for Product Certification by Surveillance of Quality Systems (approval No QIS 122)

Candidate List of substances of very high concern for Authorisation

ECHA published in accordance with Article 59(10) of the REACH Regulation (2018)

TNO-MEP-99/441

Diffusive Emissions of zinc due to atmospheric corrosion of zinc and zinc coated (galvanised) materials - R.H.J. Korenromp, J.C.Th. Hollander (1999)

Zinc Environmental Profile - 2015 Update

International Zinc Association (2016)

Zinc Recycling, Closing the Loop

International Zinc Association (2011)

Zinc...A Sustainable Material

International Zinc Association (2010)

Zinc, A Sustainable Material – Essential for Modern Life.

International Zinc Association (2017)

SimaPro V9.0

Life Cycle Assessment software

Ecoinvent V3.6

Life Cycle Inventory database, 2019

**Publisher**

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