

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and DIN EN 15804

Owner of the Declaration	Asturiana de Laminados S.A.
Programme holder	Institut Bauen und Umwelt (IBU)
Publisher	Institut Bauen und Umwelt (IBU)
Declaration number	EPD-ELZ-2013211-E
Issue date	01.04.2013
Valid to	31.03.2018

eZinc Slate
Asturiana de Laminados S.A.

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Institut Bauen
und Umwelt e.V.



General information

Asturiana de Laminados S.A.

Programme holder

IBU - Institut Bauen und Umwelt e.V.
Rheinufer 108
D-53639 Königswinter

Declaration number

EPD-ELZ-2013211-E

This Declaration is based on the Product Category Rules:

Building metals, 16-07-2012
(PCR tested and approved by the independent expert committee [SVA])

Issue date

31.03.2013

Valid to

01.04.2018



Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)



Prof. Dr.-Ing. Hans-Wolf Reinhardt
(Chairman of SVA)

ElZinc Slate

Owner of the Declaration

Asturiana de Laminados S.A.
Polígono Industrial de Olloniego, Parcela 1,
33660 Olloniego, Asturias
Spain

Declared product / Declared unit

1kg elZinc Slate

Scope:

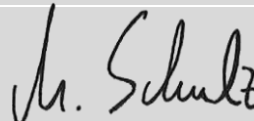
Within this study a life cycle analysis according to ISO 14040/44 and EN 15804 is performed for elZinc Slate manufactured by Asturiana de Laminados S.A. at the production plant located in Olloniego, Spain. The life cycle analysis is based on the data declared by Asturiana de Laminados S.A. The life cycle analysis is representative for the products introduced in the declaration for the given system boundaries. The life cycle analysis covers the manufacturing of the products from cradle to grave. The owner of the declaration shall be liable for the underlying information and evidence.

Verification

The CEN standard EN 15804 serves as the core PCR.

Verification of the EPD by an independent third party as per ISO 14025

internally externally



Matthias Schulz
(Independent tester appointed by SVA)

1 Product

Product description

elZinc® titanium zinc comes under the EN 988 standard, which defines the general requirements for titanium zinc strips and sheets for use in the building industry.

The alloying components are high-grade refined zinc of the highest standardised level of purity Zn 99.995 according to EN 1179, with precisely defined additions of copper and titanium. Further components, such as aluminium and other trace elements, are accurately limited and the purity of the alloy is extremely precisely monitored by regular controls.

The precision in the composition of the alloy used and the implementation controlled lamination, which define the thermo-mechanical processes and the material's micro-structural changes, are the keys to the process's and the product's excellence.

elZinc Slate is matt grey pre-weathered zinc, obtained through an industrial, non-polluting and permanent treatment that gives it a similar look to the natural patina of rolled zinc.

elZinc Slate is characterized by:

- High malleability, regardless of the direction of rolling

- High stability once conformed
- Optimal electrowelding performance due to its low surface oil content
- Limited fragility at low temperatures.

Application

elZinc Natural is a material used by architects and professional roofers. Its main applications are:

- Rehabilitation. (Since its initial color allows it to easily blend with the already existing zinc).
- Facades and roofs (E.g. reveal panels, cassettes, standing seam roofing, batten roof system, etc)
- Roof drainage systems (E.g. gutters, water pipes and accessories).
- Interior Design.

Technical Data

Asturiana de Laminados has established a quality management system based on the standard ISO 9001.

elZinc Slate satisfied all requirements of the standard DIN EN 988 giving as result excellent mechanical properties:

Name	Testing standard	Value	Unit
Yield strength elasticity (Rp 0,2)	EN ISO 6892-1	>110	N/mm ²
Tensile strength (Rm)	EN ISO 6892-1	> 150	N/mm ²
Breaking elongation (A50)	EN ISO 6892-1	>40	%
Vickers hardness (HV3)	EN ISO 6507-4	>45	-
Erichsen test	EN ISO 20482	min 7,5	mm
Remaining stretch in creeping behaviour test (Rp 0,1)	EN ISO 204	max 0,1	%
Density	-	7,2	g/cm ³
Thicknesses tolerance	-	± 0.02	mm
Coefficient of linear thermal expansion	ASTM E289-04	22E-06	m/mk
Melting point	ASTM B774	~420	°C
Heat conductivity at 20 °C	ASTM E1952-11	110	w/mK
Electric conductivity at 20 °C	ASTM E1004-09	17	mS/m

Base materials / Ancillary materials

elZinc Slate is a Zn-Cu-Ti alloy with the following composition:

Base materials in mass (%)

Component	elZinc Natural
Copper	0,08- 0,2 %
Titanium	0,07-0,12 %
Aluminium	< 0,015 %
Zinc (Z1)	Remainder

The surface treatment is performed with Zinc phosphate (1,5 g/kg).

None of the components of the end product is included in the "Candidate List of Substances of Very High Concern for Authorisation".

Reference service life

The documentation of the RSL is not required for the EPD of Asturiana de Laminados since the entire life cycle is not declared (Modules A1-A3 and D).

2 LCA: Calculation rules

Declared unit

The declared unit is 1kg of elZinc Slate

System boundary

Type of the EPD: cradle to gate - with options

In this study, the product stage information modules A1, A2, and A3 are considered. These modules include production of raw material extraction and processing (A1), transport of the raw materials to the manufacturer (A2), manufacturing of the product (A3) and the packaging materials (A3).

The EoL of the product (Modul D) is also included.

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.

3 LCA: Scenarios and additional technical information

The credits given in Module D are a result of the 100% recyclability of each zinc-product. After the scrap collection (a collection rate of 96% was assumed), zinc scrap is sent to a re-melting

process, where the scrap is converted to secondary zinc. The credit for the zinc gained through re-melting is calculated with the dataset of the primary production.

4 LCA: Results

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

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES	
Raw material supply	Transport	Manufacturing	Transport	Construction-installation process	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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1kg elZinc Slate

		Manufacturing					Credits									
Parameter	Einheit	A1-A3					D									
GWP	[kg CO ₂ -Äq.]	3,7E+00					-2,6E+00									
ODP	[kg CFC11-Äq.]	3,3E-07					-2,9E-07									
AP	[kg SO ₂ -Äq.]	2,3E-02					-1,8E-02									
EP	[kg PO ₄ ³⁻ -Äq.]	2,6E-03					-2,0E-03									
POCP	[kg Ethen Äq.]	1,5E-03					-1,1E-03									
ADPE	[kg Sb Äq.]	1,3E-03					-1,2E-03									
ADPF	[MJ]	5,1E+01					-3,4E+01									
Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non fossil resources; ADPF = Abiotic depletion potential for fossil resources															

RESULTS OF THE LCA - RESOURCE USE: 1kg elZinc Slate

		Manufacturing					Credits									
Parameter	Einheit	A1-A3					D									
PERE	[MJ]	9,9E+00					-6,6E+00									
PERM	[MJ]	0,0E+00					0,0E+00									
PERT	[MJ]	9,9E+00					-6,6E+00									
PENRE	[MJ]	5,1E+01					-3,4E+01									
PENRM	[MJ]	0,0E+00					0,0E+00									
PENRT	[MJ]	5,1E+01					-3,4E+01									
SM	[kg]	1,6E-02					0,0E+00									
RSF	[MJ]	2,0E-04					4,0E-03									
NRSF	[MJ]	2,0E-03					4,2E-02									
FW	[m ³]	-*					-*									
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources 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 excluding non renewable primary 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 material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Use of net fresh water															

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1kg elZinc Slate

		Manufacturing					Credits									
Parameter	Einheit	A1-A3					D									
HWD	[kg]	-*					-*									
NHWD	[kg]	-*					-*									
RWD	[kg]	4,8E-03					-3,6E-03									
CRU	[kg]						-									
MFR	[kg]						9,6E-01									
MER	[kg]															
EE [Typ]	[MJ]															
EE [Typ]	[MJ]															
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy per energy carrier															

* The non-EN 15804-conform LCIs are significant to the total result. The indicators are not declared (decision of IBU advisory board 2013-01-07)

5 References

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ASTM E 1952

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EN 15804

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EN 988

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EN ISO 204

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EN ISO 6507-4

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ISO 9001

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