ENVIRONMENTAL AND HEALTH DECLARATION

COMPLIANT WITH STANDARD NF P 01-010

CEMBRIT CLASSIC FIBRE CEMENT CLADDING SHEET

This declaration is presented according to the Environmental and Health Declaration Data Sheet template approved by AIMCC (FDE&S Version 2005)

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Introduction

The framework used to present the environmental and health declaration for Cembrit Classic fibre cement cladding sheets is the Environmental and Health Declaration Data Sheet template drawn up by AIMCC (FDE&S version 2005). This data sheet constitutes an appropriate framework for the presentation of the environmental and health characteristics of construction products in accordance with NF P 01-010 standard requirements and for useful additional comments and information in keeping with the spirit of this norm in terms of truthfulness and transparency (NF P 01-010 § 4.2).

A report accompanying this declaration has been drawn up and may be consulted upon signing a non disclosure agreement at SIL headquarters.

Any use, whether total or partial, of the information thus provided must at least and always be accompanied by the full reference to the original declaration: "full title, date of issue, address of the issuer" who can provide an authentic copy.

Warning

SIL has asked LCE (Life Cycle Engineering - http://www.studiolce.it/) for assistance in the drawing up of the Environmental and Health Declaration Data Sheet (EHDDS) for the product named "Cembrit Classic fibre cement cladding sheet". SIL and LCE shall not be liable in any way with respect to any third party to whom the results of the study may have been conveyed or in whose hands they may have fallen, use of the results being the responsibility of such a third party. It is worth remembering that the results of the study are based only on facts, circumstances and hypotheses submitted to us in the course of the study. If these facts, circumstances and hypotheses differ, the results may change. Furthermore, the results of the study must be considered as a whole, with respect to the hypotheses, and not taken in isolation.

Data generator (NF P 01-010 § 4).

The information contained in this declaration is provided under SIL's responsibility according to standard NF P 01-010 § 4.6.

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Reading guide

The results are presented in scientific notation with 3 significant figures:

- 1.38E+03 means 1.38 x 103, i.e. 1,380
- 2.14E-02 means 2.14 x 10-2, i.e. 0.0214

In accordance with standard NF P01-010, where table cells contain a zero, this means the value for the stage of the life cycle under consideration is nil.

1. Characterisation of the product according to NF P 01-010 § 4.3

1.1 Definition of the functional unit (FU)

The functional unit is "Covering 100 square metres of vertical wall for 1 annuity, on the basis of a Typical Life Expectancy (TLE) of 60 years".

It has been estimated that there is no replacement during the lifespan.

1.2 Masses and basic data for calculating the functional unit (FU)

Product

Cladding sheet thickness can vary given that different product categories are marketed.

In this declaration, 1 m^2 of standard product is considered to be characterised by a thickness of 5 mm and a mass of 9 kg / m^2.

Additional product

For the mounting of the cladding sheets, it is considered that metal screws and rivets will be used.

Packaging for distribution

For 1 m^2 of standard product, the distribution packaging corresponds to:

- 114 g of reused wood pallet (1 pallet corresponding to 24 kg)
- 11.7 g of HDPE film
- 0.639 g of steel.

Justification of information items provided

The production data are provided by the SIL production sites located at Verolanuova (Bs).

1.3 Useful technical characteristics not contained in the definition of the functional unit

Not applicable.

2. Inventory data and other data according to NF P 01-010 § 5 and comments relating to the environmental and health effects of the product according to NF P 01-010 § 4.7.2

The life cycle inventory data presented below have been calculated for the functional unit defined in sections 1.1 and 1.2.

2.1 Consumption of natural resources (NF P 01-010 § 5.1)

Consumption of natural energy resources and energy indicators (NF P 01-010 § 5.1.1)

FLOW		Units	Production	Transport	Installation	Lifetime	End-of-life	Total life cycle	
								Per annuity	For the whole TLE
Consumption of natural energy resources									
Wood		kg	3.75	2.53E-04	0	0	3.05E-05	3.75	225
Coal		kg	1.47	8.06E-03	2.97E-02	0	9.61E-04	1.50	90
Lignite		kg	0	0	0	0	0	0	0
Natural gas		kg	1.48	1.69E-02	1.11E-03	0	1.75E-03	1.50	90.2
Oil		kg	1.04	0.336	6.05E-04	0	3.80E-02	1.41	85
Uranium (U)		kg	4.25E-05	2.48E-07	5.26E-08	0	3.13E-08	0.00	0
Energy indicators									
Total primary energy		MJ	235	17	0.962	0	1.87	255	15.282
Including	Renewable energy	MJ	60.1	2.34E-02	0	0	2.98E-03	60	3.606
	Non renewable energy	MJ	175.2	16.6	0.962	0	1.86	195	11.675
Including	Process energy	MJ	177	0	0	0	0	177.2	10.634
	Material energy	MJ	58.1	0	0	0	0	58.1	3.485
Electricity		kWh	5.53	0	0	0	0	5.53	332

Comments relative to the consumption of natural energy resources and energy indicators

Consumption of natural energy resources: Part of the resource consumption is linked to the production of energy vectors; the other part is linked to materials (e.g. pallet wood).

Energy indicators: Feedstock energy (inherent to the material) is linked to the production of pallets, HDPE film and cellulose used as equipment. The energy indicators must be used with caution because they add up energy from various sources, which do not have the same environmental impact (it is preferable to refer to elementary workflows).

2.2 Consumption of non-energy natural resources (NF P 01-010 § 5.1.2)

FLOW	Units	Production	Transport	Installation	Lifetime	End-of-life	Total life cycle	
							Per annuity	For the whole TLE
Halogen compounds	kg	5.30E-04	2.03E-07	0	0	2.41E-08	5.30E-04	3.18E-02
Aluminium	kg	1.42E-03	1.06E-06	0	0	1.23E-07	1.42E-03	8.51E-02
Aluminium silicates	kg	6.53E-12	4.67E-15	0	0	5.43E-16	6.54E-12	3.92E-10
Anhydrite	kg	1.03E-06	8.14E-10	0	0	9.32E-11	1.032E-06	6.19E-05
Animal-derived raw materials not previously specified	kg	1.27E-11	0	0	0	0	1.28E-11	7.66E-10
Antimony (Sb)	kg	1.51E-12	8.77E-15	0	0	1.10E-15	1.53E-12	9.15E-11
Arsenic (As)	kg	0	0	0	0	0	0	0
Barium	kg	0	0	0	0	0	0	0
Bauxite	kg	1.48E-07	0	0	0	0	1.49E-07	8.91E-06
Bismuth (Bi)	kg	0	0	0	0	0	0	0
Boron (B)	kg	0	0	0	0	0	0	0
Bentonite	kg	0	0	0	0	0	0	0
Cadmium (Cd)	kg	6.87E-09	2.13E-12	0	0	2.49E-13	6.88E-09	4.13E-07
Calcium	kg	0	0	0	0	0	0	0
Calcium sulphate	kg	2.06E-06	2.96E-09	0	0	3.82E-10	2.07E-06	1.24E-04
Chemicals: agriculture	kg	0	0	0	0	0	0	0
Chromium (Cr)	kg	2.21E-04	9.91E-08	0	0	1.26E-08	2.21E-04	1.33E-02
Clay	kg	2.75	2.57E-06	0	0	6.64E-07	2.75	165
Cobalt (Co)	kg	8.42E-09	8.87E-09	0	0	1.01E-09	1.83E-08	1.10E-06
Copper (Cu)	kg	4.94E-05	1.23E-08	0	0	1.42E-09	4.94E-05	2.96E-03
Dolomite	kg	2.37E-05	9.18E-09	7.14E-04	0	1.06E-09	7.37E-04	4.42E-02
Feldspath	kg	0	0	0	0	0	0	0
Iron manganese	kg	4.67E-09	0	0	0	0	4.67E-09	2.80E-07
Fluorite (CaF2)	kg	0	0	0	0	0	0	0
Gravel	kg	5.66	1.30E-05	0	0	1.54E-06	5.66	340
Gold	kg	4.91E-10	5.91E-13	0	0	6.84E-14	4.91E-10	2.95E-08
Hydrogen	kg	0	0	0	0	0	0	0
Hydroxides	kg	0	0	0	0	0	0	0
Igneous rocks	kg	1.26E-05	2.56E-09	0	0	2.97E-10	1.26E-05	7.59E-04
Ilmenite	kg	0	0	0	0	0	0	0
Iron (Fe)	kg	4.27E-03	6.54E-07	5.21E-02	0	8.19E-08	5.64E-02	3.38
Kaolin (Al2O3, 2SiO2,2H2O)	kg	1.10E-05	1.19E-08	0	0	1.43E-09	1.10E-05	6.63E-04
Lead (Pb)	kg	1.01E-06	1.54E-10	0	0	1.79E-11	1.01E-06	6.05E-05
Limestone (CaCO3)	kg	7.60E+00	1.64E-04	7.38E-04	0	2.08E-05	7.60	456

FLOW	Units	Production	Transport	Installation	Lifetime	End-of-life	Total life cycle	
							Per annuity	For the whole TLE
Lithium (Li)	kg	2.75E-11	1.03E-14	0	0	2.71E-15	2.75E-11	1.64E-09
Magnesium (Mg)	kg	2.54E-03	6.67E-09	0	0	1.14E-09	2.54E-03	0.153
Manganese	kg	3.51E-05	1.28E-09	0	0	1.54E-10	3.51E-05	2.10E-03
Mercury (Hg)	kg	2.09E-11	0	0	0	0	2.09E-11	1.25E-09
Molybdenum (Mo)	kg	2.40E-06	1.62E-08	0	0	1.81E-09	2.42E-06	1.45E-04
Nickel (Ni)	kg	3.56E-04	1.78E-07	0	0	2.23E-08	3.56E-04	0.0214
Other (non specified)	kg	0.414	4.34E-06	0	0	5.15E-07	0.41	24.9
Other metals	kg	2.53E-04	1.01E-07	0	0	1.37E-08	2.54E-04	1.52E-02
Palladium (Pd)	kg	7.02E-15	0	0	0	0	7.02E-15	4.21E-13
Platinum (Pt)	kg	8.43E-14	0	0	0	0	8.43E-14	5.06E-12
Peroxides	kg	0	0	0	0	0	0	0
Phosphorus	kg	2.12E-03	8.11E-07	0	0	9.62E-08	2.12E-03	0.127
Potassium	kg	0	0	0	0	0	0	0
Potassium chloride	kg	0.117	3.85E-08	0	0	4.35E-09	0.117	7.05
Pozzolana	kg	0	0	0	0	0	0	0
Pyrite	kg	0	0	0	0	0	0	0
Rutile (TiO2)	kg	2.47E-06	0	0	0	0	2.5E-06	1.48E-04
Rhodium	kg	0	0	0	0	0	0	0
Sand	kg	6.12E-05	1.39E-08	0	0	1.59E-09	6.1194E-05	3.67E-03
Selenium	kg	0	0	0	0	0	0	0
Clay schist	kg	2.92E-06	2.30E-09	0	0	2.64E-10	2.9E-06	1.75E-04
Silicates	kg	1.59E-06	1.08E-09	0	0	1.33E-10	1.6E-06	9.58E-05
Silver (Ag)	kg	1.33E-09	1.59E-12	0	0	1.84E-13	1.3E-09	7.97E-08
Slate	kg	5.99E-17	0	0	0	0	6.0E-17	3.60E-15
Sodium carbonate	kg	0	0	0	0	0	0	0
Sodium chloride	kg	0.107	6.98E-05	0	0	8.91E-06	0.107	6.43
Sodium	kg	2.96E-03	1.18E-06	0	0	1.40E-07	2.96E-03	0.178
Sodium nitrate	kg	2.16E-11	8.20E-15	0	0	9.41E-16	2.16E-11	1.29E-09
Barium sulphate	kg	0.00025327	1.09E-07	0	0	1.35E-08	2.53E-04	0.0152
Sodium sulphate	kg	0	0	0	0	0	0	0
Sulphur (S)	kg	9.39E-05	2.80E-08	0	0	3.21E-09	9.39E-05	5.63E-03
Talcum	kg	1.35E-06	1.38E-09	0	0	1.71E-10	1.35E-06	8.106E-05
Pewter (Sn)	kg	3.77E-06	2.71E-11	0	0	3.15E-12	3.77E-06	2.26E-04
Titanium (Ti)	kg	1.49E-06	0	0	0	0	1.49E-06	8.932E-05
Titanium oxide	kg	6.03E-03	2.44E-06	0	0	2.93E-07	6.03E-03	0.362
Tungsten (W)	kg	0	0	0	0	0	0	0
Wood and biomass	kg	3.75	2.53E-04	0	0	3.05E-05	3.75	225.2
Vanadium (V)	kg	0	0	0	0	0	0	0
Zirconium (Zr)	kg	6.54E-10	7.88E-13	0	0	9.12E-14	6.55E-10	3.93E-08
Zinc (Zn)	kg	5.92E-06	2.41E-08	0	0	2.75E-09	5.94E-06	3.57E-04

Comments relative to the consumption of non-energy natural resources:

The main non-energy resources consumed are clay, gravel and limestone, which are mainly involved in cement production.

2.3 Water consumption (samples) (NF P 01-010 § 5.1.3)

FLOW	Units	Production	Transport	Installation	Lifetime	End-of-life	Total life cycle	
							Per annuity	For the whole TLE
Lake water	litre	1.227	1.22E-03	0	0	1.40E-04	1.23	73.7
Sea water	litre	4.57	8.09E-02	0	0	1.05E-02	4.66	279
Phreatic surface water	litre	22.2	2.42E-02	0	0	3.76E-03	22.31	1339
Non specified water source	litre	58.7	0.918	0.472	0	0.102	60	3.609
River water	litre	25.8	0.326	0	0	3.85E-02	26.2	1.574
Drinking water (mains)	litre	0	0	0	0	0	0	0
Total water consumed	litre	112	1.35	0.472	0	0.155	115	6.875

Comments relative to water consumption (samples):

Water consumption is mainly linked to the production phase. In particular, water consumption is involved in production of materials such as cement and cellulose.

2.4 Consumption of energy and recovered materials (NF P 01-010 § 5.1.4)

The consumption of recovered energy is nil. The direct consumption of material recovered by SIL is nil and indirect consumption is negligible.

2.5 Emissions to air, water and soil (NF P 01-010 § 5.2)

Emissions to air (NF P 01-010 § 5.2.1)

AIR EMISSION	Units	Production	Transport	Installation	Lifetime	End-of-life	Total life cycle	
							Per annuity	For the whole TLE
Hydrocarbons (non specified, except methane)	g	1.22	9.18E-02	0	0	1.03E-02	1.32	79.4
HAP (non specified)	g	0.0230	2.00E-03	0	0	2.55E-04	2.53E-02	1.52
Methane (CH4)	g	21.0	1.17	0.214	0	0.115	22.5	1.352
Volatile organic compounds (such as acetone, acetate, etc.)	g	2.22E-03	0	0	0	0	2.22E-03	0.133
Non-methane volatile organic compounds	g	4.31	0.747	1.17E-02	0	0.117	5.19	311
Non specified and fossil carbon dioxide (CO2)0	g	13.398	1.113	81	0	124	14.716	882.957
Biogenic carbon dioxide (CO2)0	g	519	0.454	0	0	5.43E-02	519.87	31.192
Land transformation carbon dioxide (CO2)0	g	132	1.55E-03	0	0	1.82E-04	131.9	7.913
Carbon monoxide (CO)	g	8.07	1.80	1.00	0	0.262	11.1	668
Nitrogen oxides (NOx as NO2)	g	29.7	9.10	9.36E-02	0	1.15	40.02	2.401
Nitrogen protoxide (N2O)	g	0.34	0.03	3.35E-04	0	4.48E-03	0.382	22.9
Ammonia (NH3)	g	0.38	0.01	0	0	8.51E-04	0.391	23.47
Dusts (non specified)	g	6.08	0.389	4.16E-02	0	7.38E-02	6.59	395.36
Sulphur oxides (SOx as SO2)	g	26.1	0.922	1.02E-01	0	0.126	27.3	1,637.77
Hydrogen Sulphide (H2S)	g	0.0497	4.09E-05	2.10E-03	0	5.29E-06	5.18E-02	3.11
Hydrocyanic acid (HCN)	g	1.56E-07	0	0	0	0	1.56E-07	9.37E-06
Chlorine compounds organic (as Cl)	g	1.04E-02	1.76E-06	0	0	2.02E-07	1.04E-02	0.626
Hydrochloric acid (HCl)	g	0.183	1.51E-03	1.59E-03	0	1.81E-04	0.19	11.19

AIR EMISSION	Units	Production	Transport	Installation	Lifetime	End-of-life	Total life cycle	
							Per annuity	For the whole TLE
Chlorine compounds inorganic (as Cl)	g	9.31E-03	4.75E-05	0	0	5.60E-06	9.36E-03	0.562
Chlorine compounds non specified (as Cl)	g	0	0	0	0	0	0	0
Fluorine compounds organic (as F)	g	1.68E-03	2.38E-03	0	0	2.40E-04	4.29E-03	0.26
Fluorine compounds inorganic (as F)	g	6.41E-04	1.91E-06	0	0	2.34E-07	6.43E-04	0.04
Halogenated compounds (non specified)	g	4.21E-03	3.77E-05	0	0	4.32E-06	4.25E-03	0.25
Fluorinated compounds non specified (as F)	g	0	0	0	0	0	0	0
Metals (non specified)	g	2.47E-02	1.79E-04	0	0	2.16E-05	2.49E-02	1.50
Aluminium and its compounds (as Al)	g	2.04E-01	4.10E-04	0	0	5.04E-05	0.205	12.27
Antimony and its compounds (as Sb)	g	8.46E-05	1.07E-07	0	0	1.29E-08	8.47E-05	5.08E-03
Arsenic and its compounds (as As)	g	4.95E-04	6.89E-06	0	0	8.23E-07	5.03E-04	3.02E-02
Cadmium and its compounds (as Cd)	g	1.87E-04	1.43E-05	2.59E-06	0	1.68E-06	2.05E-04	1.23E-02
Chromium and its compounds (as Cr)	g	9.72E-04	4.56E-05	6.03E-06	0	4.88E-06	1.03E-03	6.17E-02
Cobalt and its compounds (as Co)	g	4.78E-04	1.09E-05	0	0	1.33E-06	4.90E-04	2.94E-02
Copper and its compounds (as Cu)	g	3.77E-03	2.25E-03	0	0	2.32E-04	6.25E-03	0.375
Pewter and its compounds (as Sn)	g	7.13E-05	5.65E-08	0	0	7.04E-09	7.13E-05	4.28E-03
Iron and its compounds (as Fe)	g	3.99E-02	2.82E-04	0	0	3.51E-05	4.02E-02	2.41
Manganese and its compounds (as Mn)	g	1.58E-03	6.08E-06	0	0	7.58E-07	1.59E-03	9.52E-02
Mercury and its compounds (as Hg)	g	3.37E-04	4.93E-06	3.19E-06	0	5.28E-07	3.45E-04	2.07E-02
Nickel and its compounds (as Ni)	g	6.72E-03	2.13E-04	0	0	2.47E-05	6.96E-03	0.417
Lead and its compounds (as Pb)	g	1.72E-03	1.37E-04	1.28E-04	0	1.41E-05	2.00E-03	1.20E-01
Potassium and its compounds (as K)	g	8.75E-02	1.14E-04	0	0	1.40E-05	8.76E-02	5.26
Rhodium and its compounds (as Rh)	g	1.82E-15	0	0	0	0	1.82E-15	1.09E-13
Scandium and its compounds (as Sc)	g	1.24E-04	7.38E-07	0	0	9.30E-08	1.25E-04	7.49E-03

AIR EMISSION	Units	Production	Transport	Installation	Lifetime	End-of-life	Total life cycle	
							Per annuity	For the whole TLE
Selenium and its compounds (as Se)	g	2.97E-04	9.49E-06	0	0	1.10E-06	3.08E-04	1.85E-02
Silicium and its compounds (as Si)	g	4.66E-02	5.29E-05	0	0	6.63E-06	4.67E-02	2.80
Sodium and its compounds (as Na)	g	1.22E-02	2.77E-04	0	0	3.27E-05	1.26E-02	0.753
Strontium and its compounds	g	5.10E-04	2.64E-06	0	0	3.21E-07	5.13E-04	0.03
Tallium and its compounds	g	8.04E-05	5.48E-10	0	0	2.05E-10	8.04E-05	4.82E-03
Tellurium and its compounds (as Te)	g	1.90E-10	0	0	0	0	1.90E-10	1.14E-08
Zinc and its compounds (as Zn)	g	4.19E-03	9.64E-04	0	0	1.01E-04	5.25E-03	0.315
Uranium and its compounds (as U)	g	7.52E-07	7.37E-10	0	0	9.54E-11	7.53E-07	4.52E-05
Vanadium and its compounds (as V)	g	1.43E-02	2.97E-04	0	0	3.49E-05	1.47E-02	0.879
Water	g	942	3.11E-04	0	0	3.73E-05	942	5.6E+04
Inorganic compounds (non specified)	g	0.560	4.92E-04	0	0	5.96E-05	0.560	33.6
Organic compounds (non specified)	g	8.51E-02	3.54E-03	4.59E-11	0	3.81E-04	8.90E-02	5.34
Alcohols	g	7.90E-02	1.04E-04	0	0	1.19E-05	7.86E-02	4.72
Etc.	g	0.378	2.04E-03	0	0	2.01E-04	0.381	22.8

Comments relative to emissions to air:

The emissions that contribute the most to air pollution are emissions of carbon dioxide, methane, volatile organic compounds, carbon monoxide, nitrogen oxides and sulphur oxides.

Emissions to water (NF P 01-010 § 5.2.2)

WATER EMISSION	Units	Production	Transport	Installation	Lifetime	End-of-life	Total life cycle	
							Per annuity	For the whole TLE
Sulphate	g	179	1.11	0	0	0.132	180	10784
COD (Chemical Oxygen Demand)	g	36.8	3.12	0.02	0	0.404	40.3	2419
HAP (non specified)	g	5.58E-03	2.00E-03	0	0	2.37E-04	7.82E-03	0.469
Ammonia (NH_3)	g	4.08E-02	1.50E-03	1.17E-04	0	1.73E-04	4.25E-02	2.55
DBO5 (5-day Biochemical Oxygen Demand)	g	14.5	3.10	2.20E-05	0	0.40	18.0	1079
Suspended matter (SM)	g	1.70	1.95E-02	0	0	2.29E-03	1.72	103
Cyanide (CN^-)	g	1.02E-02	3.78E-05	0	0	4.36E-06	1.02E-02	0.614
AOX (Halogens of Adsorbable organic compounds)	g	6.49E-04	1.23E-05	0	0	1.54E-06	6.63E-04	3.98E-02
Hydrocarbons (non specified)	g	0.18	1.45E-02	0	0	1.70E-03	0.194	11.7
Nitrogen compounds (as N)	g	0.70	2.03E-03	2.04E-03	0	2.45E-04	0.704	42.2
Phosphorus compounds (as P)	g	5.34	4.30E-02	2.90E-05	0	5.24E-03	5.38	323
Organic fluorine compounds (as F)	g	7.85E-09	0	0	0	0	7.85E-09	4.71E-07
Inorganic fluorine compounds (as F)	g	0.227	1.73E-03	0	0	2.05E-04	0.229	13.8
Non specified fluorine compounds (as F)	g	0	0	0	0	0	0	0
Organic chlorine compounds (as Cl)	g	4.17E-03	5.40E-08	0	0	6.56E-09	4.17E-03	0.250
Inorganic chlorine compounds (as Cl)	g	227	9.54	0	0	1.12	239	14.317
Non specified chlorine compounds (as Cl)	g	2.47E-04	4.95E-08	0	0	5.80E-09	2.47E-04	0.01
Hexavalent chromium	g	1.58E-02	9.61E-05	0	0	1.21E-05	1.59E-02	0.954
Metals (non specified)	g	57.9	1.09	0	0	0.129	59.1	3548
Aluminium and its compounds (as Al)	g	3.13	2.38E-02	0	0	2.85E-03	3.16	190
Antimony and its compounds (as Sb)	g	5.09E-03	1.04E-05	0	0	1.23E-06	5.11E-03	0.306
Arsenic and its compounds (as As)	g	9.01E-03	6.7E-05	0	0	8.31E-06	9.09E-03	0.545
Cadmium and its compounds (as Cd)	g	1.50E-03	1.35E-05	1.22E-06	0	1.54E-06	1.52E-03	9.11E-02
Chromium and its compounds (as Cr)	g	1.02E-03	5.99E-05	2.27E-06	0	6.59E-06	1.09E-03	6.54E-02
Cobalt and its compounds (as Co)	g	3.44E-02	2.61E-04	0	0	3.12E-05	3.47E-02	2.08

WATER EMISSION	Units	Production	Transport	Installation	Lifetime	End-of-life	Total life cycle	
							Per annuity	For the whole TLE
Copper and its compounds (as Cu)	g	0.153	3.80E-04	0	0	4.14E-05	0.15	9.19
Pewter and its compounds (as Sn)	g	3.09E-09	0E+00	0	0	0	3.09E-09	1.85E-07
Manganese and its compounds (as Mn)	g	1.38	1.07E-02	0	0	1.27E-03	1.40	83.77
Mercury and its compounds (as Hg)	g	4.89E-04	3.70E-06	0	0	4.42E-07	4.93E-04	2.96E-02
Nickel and its compounds (as Ni)	g	0.155	1.19E-03	2.96E-06	0	1.42E-04	0.156	9.36
Lead and its compounds (as Pb)	g	1.37E-02	2.21E-04	8.70E-07	0	2.35E-05	1.39E-02	0.835
Potassium and its compounds (as K)	g	13.7	0.152	0	0	1.80E-02	13.8	831
Rhodium	g	0	0	0	0	0	0	0
Scandium and its compounds	g	4.13E-03	3.11E-05	0	0	3.75E-06	4.17E-03	0.250
Selenium and its compounds (as Se)	g	5.37E-03	4.38E-05	0	0	5.22E-06	5.42E-03	0.325
Silicium and its compounds (as Si)	g	23.9	0.197	0	0	2.36E-02	24.1	1.446
Iron and its compounds (as Fe)	g	6.16	3.84E-02	5.77E-04	0	4.58E-03	6.20	372
Sodium and its compounds (as Na)	g	136.6	5.86	0	0	0.69	143	8.590
Sulphur and its compounds (S)	g	0.784	2.24E-03	0	0	2.91E-04	0.787	47.22
Strontium and its compounds	g	0.64	3.86E-02	0	0	4.53E-03	0.682	40.90
Tallium and its compounds	g	2.12E-04	1.20E-06	0	0	1.89E-07	2.13E-04	0.01
Tellurium and its compounds (as Te)	g	0	0	0	0	0	0	0
Zinc and its compounds (as Zn	g	0.193	8.80E-03	7.49E-05	0	8.42E-04	0.202	12.14
Uranium and its compounds (as U)	g	0	0	0	0	0	0	0
Vanadium and its compounds (as V)	g	1.80E-02	1.03E-04	0	0	1.24E-05	1.81E-02	1.09
Discarded water	g	0	0	0	0	0	0	0.00
Inorganic compounds (non specified)	g	5.35	0.04	0	0	4.30E-03	5.39	323.28
Organic compounds (non specified)	g	0.32	0.08	0	0	9.55E-03	0.408	24.50
Alcohols	g	0.02	1.74E-03	0	0	2.07E-04	1.77E-02	1.06
Etc.	g	3.20	0.979	6.27E-05	0	0.126	4.31	258.62

Comments on emissions to water: The emissions that contribute most to water pollution are sulphate emissions, chemical oxygen demand, 5-day biochemical oxygen demand, inorganic chlorinated compounds and metals.

Emissions to soil (NF P 01-010 § 5.2.3)

SOIL EMISSION	Units	Production	Transport	Implementation	Lifetime	End-of-life	Total life cycle	
							Per annuity	For the whole TLE
Arsenic and its compounds (as As)	g	3.07E-06	3.05E-09	0	0	3.67E-10	3.07E-06	1.84E-04
Biocides	g	1.50E-04	6.38E-08	0	0	7.34E-09	1.50E-04	8.97E-03
Ammonia	g	1.40E-03	0.00E+00	0	0	0.00E+00	1.40E-03	8.39E-02
Aluminium and its compounds (as Al)	g	9.36E-03	1.39E-05	0	0	1.64E-06	9.37E-03	0.562
Barium and its compounds (as Ba)	g	5.27E-05	2.90E-07	0	0	3.28E-08	5.30E-05	3.18E-03
Boron and its compounds (as Bo)	g	2.11E-06	7.43E-08	0	0	8.35E-09	2.19E-06	1.32E-04
Cadmium and its compounds (as Cd)	g	7.54E-06	2.19E-06	0	0	1.88E-07	9.92E-06	5.95E-04
Calcium and its compounds (as Ca)	g	0.123	0	0	0	1.91E-05	0.123	7.38
Chromium and its compounds (as Cr)	g	9.83E-05	1.05E-05	0	0	9.05E-07	1.10E-04	6.59E-03
Carbon	g	1.04E-02	8.41E-05	0	0	9.54E-06	1.05E-02	0.63
Copper and its compounds (as Cu)	g	3.74E-04	1.46E-04	0	0	1.25E-05	5.33E-04	3.20E-02
Cobalt and its compounds (as Co)	g	7.93E-06	8.19E-09	0	0	9.88E-10	7.94E-06	4.76E-04
Pewter and its compounds (as Sn)	g	1.08E-06	5.24E-10	0	0	6.47E-11	1.08E-06	6.49E-05
Iron and its compounds (as Fe)	g	8.80E-02	4.74E-03	0	0	4.12E-04	9.31E-02	5.59
Lead and its compounds (as Pb)	g	8.32E-05	8.99E-05	0	0	7.68E-06	1.81E-04	1.08E-02
Magnesium and its compounds (as Mg)	g	1.39E-02	1.64E-05	0	0	1.97E-06	1.39E-02	0.835
Manganese and its compounds (as Mn)	g	8.54E-03	9.43E-06	0	0	1.13E-06	8.55E-03	0.513
Mercury and its compounds (as Hg)	g	9.56E-08	8.32E-11	0	0	1.01E-11	9.57E-08	5.74E-06
Molibdenum and its compounds (as Mo)	g	1.70E-06	1.77E-09	0	0	2.13E-10	1.70E-06	1.02E-04
Nickel and its compounds (as Ni)	g	4.18E-05	2.83E-05	0	0	2.42E-06	7.25E-05	4.35E-03
Zinc and its compounds (as Zn)	g	4.33E-03	6.17E-03	0	0	5.27E-04	1.10E-02	0.66
Heavy metals (non specified)	g	0	0	0	0	0	0	0
Oil	g	3.00	0.992	0	0	0.130	4.12	247
Phosphorus and its compounds (as P)	g	4.18E-03	4.35E-06	0	0	5.24E-07	4.19E-03	0.251
Potassium and its compounds (as K)	g	2.36E-02	2.42E-05	0	0	2.92E-06	2.36E-02	1.42

SOIL EMISSION	Units	Production	Transport	Installation	Lifetime	End-of-life	Total life cycle	
							Per annuity	For the whole TLE
Silicon and its compounds (en Si)	g	3.60E-02	3.74E-05	0	0	4.51E-06	3.60E-02	2.16
Sodium and its compounds (as Na)	g	1.94E-04	1.19E-07	0	0	1.40E-08	1.94E-04	1.17E-02
Strontium and its compounds (as Sr)	g	8.86E-04	9.64E-07	0	0	1.08E-07	8.87E-04	5.32E-02
Chloride	g	3.46E-03	2.71E-06	0	0	3.22E-07	3.46E-03	0.208
Fluoride	g	2.05E-05	4.24E-09	0	0	4.98E-10	2.05E-05	1.23E-03
Etc.	g	5.02E-03	4.52E-06	0	0	5.46E-07	5.02E-03	0.301

Comments on emissions to soil: In comparison with emissions to water, emissions to soil are relatively low and contribute little to pollution.

2.6 Waste production (NF P 01-010 § 5.3)

Reusable waste (NF P 01-010 § 5.3)

FLOW	Units	Production	Transport	Installation	Lifetime	End-of-life	Total life cycle	
							Per annuity	For the whole TLE
Energy recovered	MJ	0	0	0	0	0	0	0
Material recovered: Total	kg	0	0	0	0	0	0	0
Material recovered: Steel	kg	1.92E-02	0	0	0	0	1.92E-02	1.153
Material recovered: Aluminium	kg	0	0	0	0	0	0	0
Material recovered: Metal (non specified)	kg	0	0	1.007E-03	0	0	1.007E-03	6.41E-02
Material recovered: Paper-Cardboard	kg	0	0	0	0	0	0	0
Material recovered: Plastic	kg	0	0	1.96E-02	0	0	1.96E-02	1.175
Material recovered: Cullet	kg	0	0	0	0	0	0	0
Material recovered: Biomass	kg	9.33E-02	0	0.191	0	0	0.284	17.1
Material recovered: Mineral	kg	7.71	0	0	0	0	7.71	463
Material recovered: Oil	kg	1.05E-03	0	0	0	0	1.05E-03	0.0632
Etc.	...	0	0	0	0	0	0	0

Comments relative to the production and modalities of management of reusable waste:

The production of reusable waste is linked - for the production phase - to the recycling of steel, wood, cement waste and oils. For the installation phase, waste is linked to packaging (iron, HDPE and wood).

Eliminated waste (NF P 01-010 § 5.3)

FLOW	Units	Production	Transport	Implementation	Lifetime	End-of-life	Total life cycle	
							Per annuity	For the whole TLE
Hazardous waste	kg	0	0	0	0	0	0.00	0
Non hazardous waste	kg	0	0	0	0	15.0	15.0	900
Inert waste	kg	0	0	0	0	0	0.00	0
Radioactive waste	kg	0	0	0	0	0	0	0
Etc.	kg	0	0	0	0	0	0	0

Comments relative to the production and modalities of management of discarded waste:

The discarded waste is specific to the SIL plant. Waste linked to the production of material (cement, cellulose, etc.) is not taken in consideration. The mass of 15.0 kg (end-of-life phase) corresponds to a cladding sheet immediately after discarding to the landfill.

3. Forms of environmental impact representative of construction products according to NF P 01-010 § 6

All information on the different forms of environmental impact is given or calculated in accordance with the indications of standard NF P01-010 § 6.1, based on data from § 2 and for the reference functional unit per annuity as defined in § 1.1 and 1.2 of this declaration, as well as for the functional unit in terms of the entire TLE (Typical Life Expectancy).

N°	Environmental impact	Value of the indicator for a functional unit		Value of the indicator for the entire TLE	
	Consumption of energy resources				
1	Total primary energy	255	MJ/FU	15.281	MJ
	Renewable energy	60	MJ/FU	3.606	MJ
	Non-renewable energy	195	MJ/FU	11.674	MJ
2	Depletion of resources (ADP)	8.51E-02	Antimony (Sb) kg equivalent /FU	5.11	Antimony (Sb) kg equivalent
3	Total water consumption	114	litres/FU	6.875	litres
4	Solid waste				
	Reusable waste (total)	8.63	kg/FU	518	kg
	Discarded waste:				
	Hazardous waste	0	kg/FU	0	kg
	Non hazardous waste	15	kg/FU	900	kg
	Inert waste	0	kg/FU	0	kg
	Radioactive waste	0	kg/FU	0	kg
5	Climatic change	15.52	CO2 kg equivalent/FU	931	CO2 kg equivalent
6	Air acidification	5.64E-02	SO2 kg equivalent/FU	3.38	SO2 kg equivalent
7	Air pollution	1.079	m^3/FU	64.755	m^3
8	Water pollution	6.21	m^3/FU	372	m^3
9	Destruction of the stratospheric ozone layer	1.45E-06	CFC equivalent R11/FU	8.69E-05	CFC equivalent R11
10	Formation of photochemical ozone	2.11E-03	Ethylene kg equivalent/FU	1.27E-01	Ethylene kg equivalent

4. Contribution of the product to the evaluation of health risks and quality of life inside buildings according to NF P 01-010 §7

Contribution of the product		Paragraph concerned
To the evaluation of health risks	Health quality of internal spaces	§ 4.1
	Health quality of water	§ 4.1
To the quality of life	Hygrothermic comfort	§ 4.2
	Acoustic comfort	§ 4.2
	Visual comfort	§ 4.2
	Olfactive comfort	§ 4.2

4.1 Useful information for the evaluation of health risks (NF P 01-010 §7.2)

Contribution to the health quality of internal spaces (NF P 01-010 § 7.2.1)

Used inside, the product is resistant to humidity, mould and insects. When used under normal conditions and as scheduled for the product, there is no known risk to health due to the raw materials used and their behaviour after installation. The product is resistant to UV and most chemical agents to be found in products used for cladding sheet cleaning.

Contribution to the health quality of water (NF P 01-010 § 7.2.2)

The Cembrit Classic cladding sheet is not in contact with drinking water consumed in the building and therefore does not affect the health quality of water.

4.2 Contribution of the product to the quality of life inside buildings (NF P 01-010 § 7.3)

Characteristics of the product participating in the creation of conditions of hygrothermic comfort inside buildings (NF P 01-010 § 7.3.1)

The hygrothermic performance of the product is maximised so as to ensure that it is perfectly waterproof; the fire-resistant properties do not contribute to the calorific load or to fire propagation. The product belongs to class A2-s1,d0.

Physical characteristics for construction:

The information about the technical characteristics of the product is available in the product technical data sheet.

5. Other contributions of the product, notably in terms of eco-management of buildings, economic issues and comprehensive environmental policy

5.1 Eco-management of buildings

Energy management

Cembrit Classic cladding sheets are not designed to provide thermal isolation for the building. However, they participate in the management of energy thanks to their thermal characteristics, thus allowing better control of energy consumption both for heating and air conditioning.

Water management

Not applicable.

5.2 Upkeep and maintenance

Cembrit Classic cladding sheets require no special maintenance. The SIL® product is resistant to crumbling, bad weather and UV, and is resistant to attack by moulds and termites. In case of cladding sheet degradation, it can be dismounted and easily replaced.

5.3 Economic issues

Ventilated cladding provides protection for the building and improves its isolation (notably from the outside). It represents a modest investment which is rapidly recovered by saving on the lifetime of the building:

5.4 Comprehensive environmental policy

SIL is committed to a comprehensive approach to improve its environmental performance.

Natural resources

Cembrit Classic cladding sheets are essentially composed of mineral basic material for which there is currently no known lack of resources. Most of these materials are marketed by the manufacturing country.

Emissions to air, water and soil

Measures to reduce harm to the environment caused by the manufacturing process:

- In air: dust emissions are recovered by filtering equipment and returned to the manufacturing process.
- In water: the production workshop is equipped to ensure the treatment of waste water. All the water circulating for manufacture or cleaning is mechanically filtered and returned to the manufacturing process.

Waste

Production waste:

All manufacturing residues produced on the manufacturing site are recycled.

Installation:

Packaging is reduced to the minimum. The pallets used for transporting the products are reusable. The cladding sheets can be delivered ready for mounting at the client's request so as to avoid the production of waste during the mounting phase.

End-of-life waste:

The most likely destination for Cembrit Classic products is a landfill for inert materials.

When they can be separated, if the building is dismantled, Cembrit Classic cladding sheets can be mixed with other products and used as material for road construction and noise barriers.

6. Annex: Characterisation of data for calculating the Life Cycle Inventory (LCI)

6.1 Definition of the LCA (Life Cycle Assessment) system

Included steps and workflows

Production

- Production of raw materials
- Transport of raw materials to the site of manufacture (Verolanuova (Bs))
- Product manufacture
- Production and end-of-life of packaging for raw materials
- Production of packaging for finished products

Transport

- Product transport

Installation

- End-of-life of packaging for finished product (recycled or reused)
- For the mounting of the cladding sheets, it is considered that metal screws and rivets will be used. The energy required to secure the cladding sheets is considered negligible.

Lifetime

- No workflow has been considered because the system does not require renovation

End-of-life

- Waste transport
- Waste processing

Omitted workflows

Standard NF P01-010 allows the following workflows to be omitted from the boundaries of the system:

- Workshop lighting, heating and cleaning
- The administrative department,
- The transport of employees,
- The manufacture of the production tool and transport systems (machines, lorries, etc.).

Rules of boundary definition

Standard NF P01-010 defines the cut-off threshold as 98 %.

Within the framework of this declaration, all the constituents of a functional unit have been taken into account provided the information was available.

6.2 Data sources

Characterisation of the main data

Manufacture

- Year: 2011
- Geographic representativity: Italy
- Technological representativity: SIL plant
- Source: SIL data + Ecoinvent v.2.2 + Plastics Europe + World Steel Association

Transport

- Year: 2011
- Source: SIL data + Ecoinvent v2.2

Installation

- Year: 2011
- Geographical zone: Europe
- Source: SIL data + Ecoinvent v2.2

Lifetime

- No data

End-of-life

- Year: 2011
- Source: SIL data + Ecoinvent v2.2

Energy data

The data used concerning energy, and in particular the inventories for the production of electricity and for the production and combustion of diesel fuel are derived from the database Ecoinvent v2.2

6.3 Traceability

The sources of data are listed in the accompanying report.