ENVIRONMENTAL PRODUCT DECLARATION

FLAT SHEET IN FIBER CEMENT

Società Italiana Lastre S.p.A

EPD®
ENVIRONMENTAL PRODUCT DECLARATION

Based on	Revision	Certification N°	Valid until
PCR 2012:01 Construction products and Construction services, Version 2.0, 2015- 03-03 and EN: 15804:2014	0 of 2015/03/11	S-P-00669	2018, February 28

1. SIL GROUP

Società Italiana Lastre S.p.A. (SIL) was founded in **1961** and established itself in the market thanks to the production of corrugated flat sheet production in fiber cement and thanks to the wide variety of products.

From **1973** SIL began to produce **flat sheets**, products subject of the present EPD.

ISO
14001 : 1996

ISO
9001 : 2008

SIL GROUP IS CERTIFIED BOTH **ISO 14001** AND **ISO 9001**

SIL plant is located in **Verolanuova** (BS)

1961
Foundation

SIL GROUP IS ONE OF THE FIRST COMPANY IN EUROPE FOR PRODUCT QUALITY AND WORKERS' SKILLS.

2015

2. THE PRODUCT

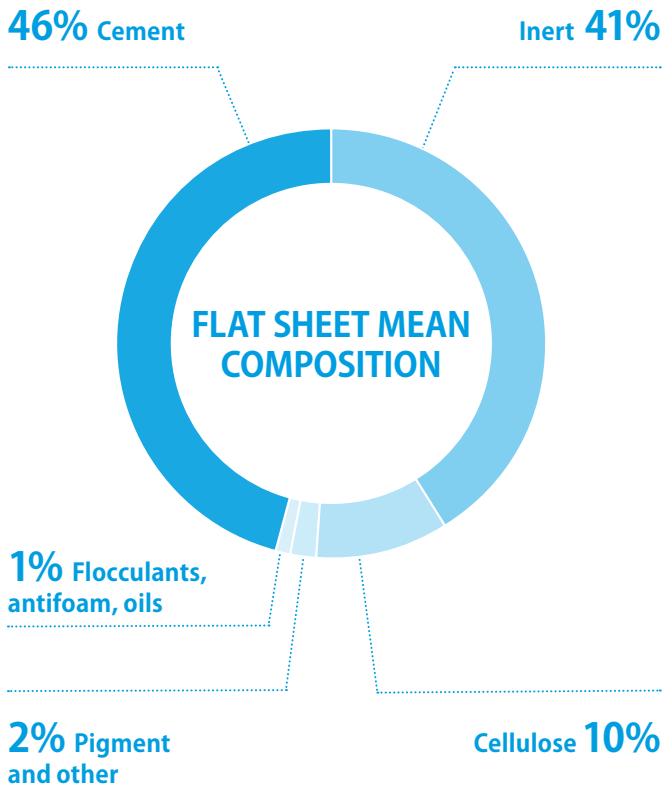
FLAT SHEET IN FIBER CEMENT

Flat sheets represent the new generation of sheet, composed by cement and inert materials, reinforced with cellulose and autoclaved.

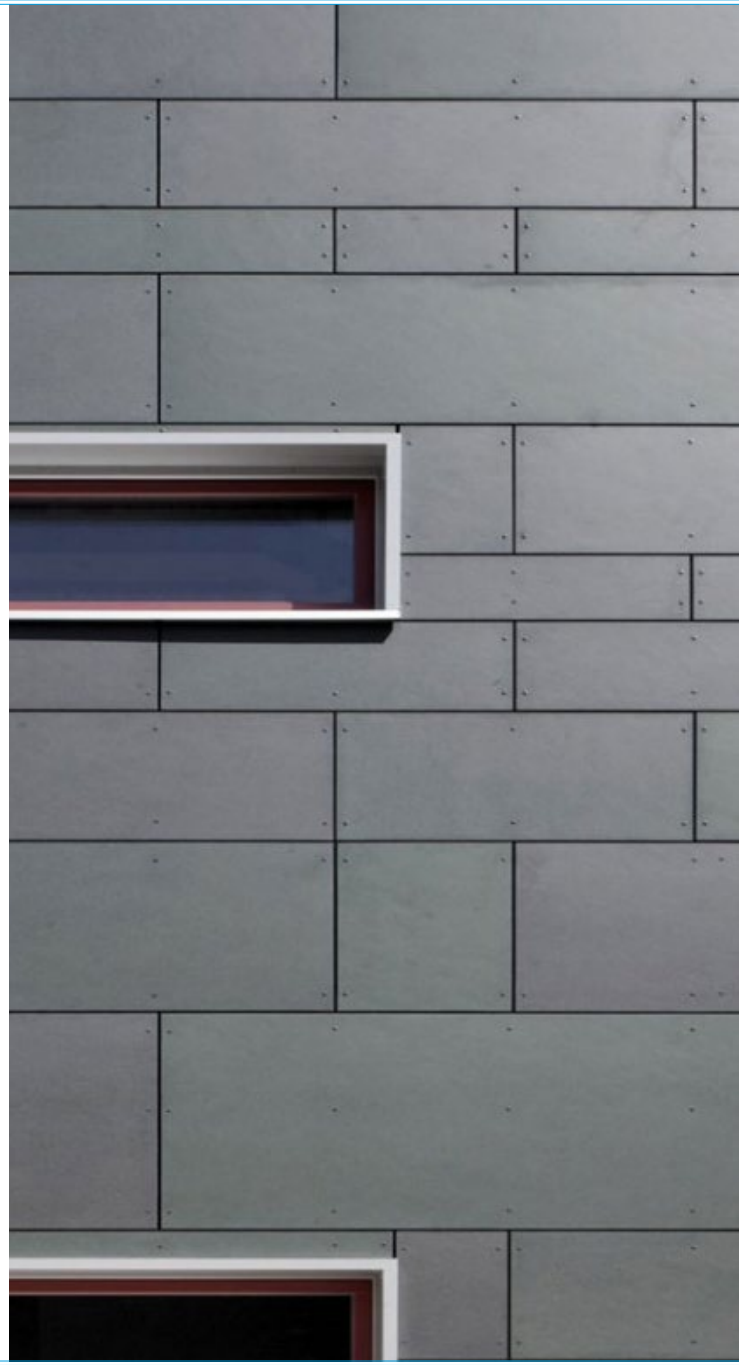
They are fire-resistant, non putrescible and difficult to be attacked by rodents, scums and fungi.

Sheets are produced in different thicknesses ranging from 4 mm to 32 mm, they could be colored in mass.
About 10% of the flat sheets are painted.

Building applications are various because they can be used both for internal (walls, floors) and external application (facades).



Raw materials used for flat sheets do not include substances listed in the document "Candidate List of SVHC" released by European Chemicals Agency (http://echa.europa.eu/candidate-list-table).



3. ENVIRONMENTAL PERFORMANCE

METODOLOGY

Environmental impacts have been evaluated considering all the phases of the product life cycle according to the rules listed in the PCR 2012:01.

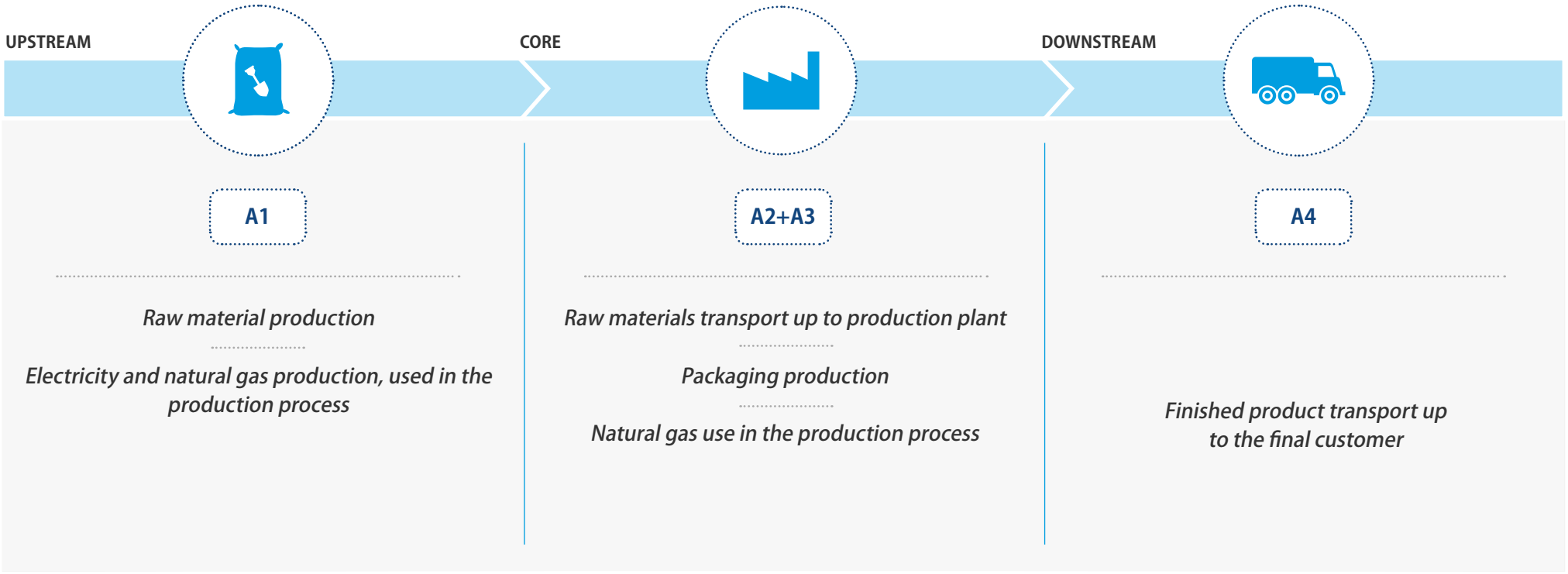
Data collected are referred to the whole 2013 production, occurred in Verolanuova plant.
Ecoinvent database (version 2.2) and Simapro 8.0.3.14. are used for the elaboration.

DECLARED UNIT

Data and results are referred to **1 m²** of surface in different thicknesses.
In the present EPD, sheets with thickness 4, 5, 6 and 8 mm are considered because they represent the 99% of 2013 production.

Since environmental impacts differ from more than 10% both among different thicknesses and among painted and not painted sheets, results are reported separately both for not painted flat sheets with 4, 5, 6 and 8 mm of thickness and for painted sheet with 8 mm thickness.

4. SYSTEM BOUNDARIES



The system analysed includes all life cycle phases from raw material production to final cutomer distribution, as required by the option "cradle to gate with options" of the reference PCR.

The option includes the evaluation of upstream process (module A1), core process (modules A2 and A3) and downstream process (module A4).

5. UPSTREAM PROCESSES

Cement comes from North Italy production plants, near to Verolanuova

Inerts (such as sand) are used to increase sheet strength

Chemical additives (oils, varnish) are used in small amount to help production process

Cellulose is composed by virgin fibres and it is produced in South America

A1 - Raw materials and Energy production

Electricity and natural gas production used in the production process

6. CORE PROCESSES

A2 - raw materials transport

Raw materials transport up to Verolanuova plant.

Packaging materials production
(HDPE film; pallet and metallic strappings)

A3 - Production process

Use of thermal energy and water during the production process

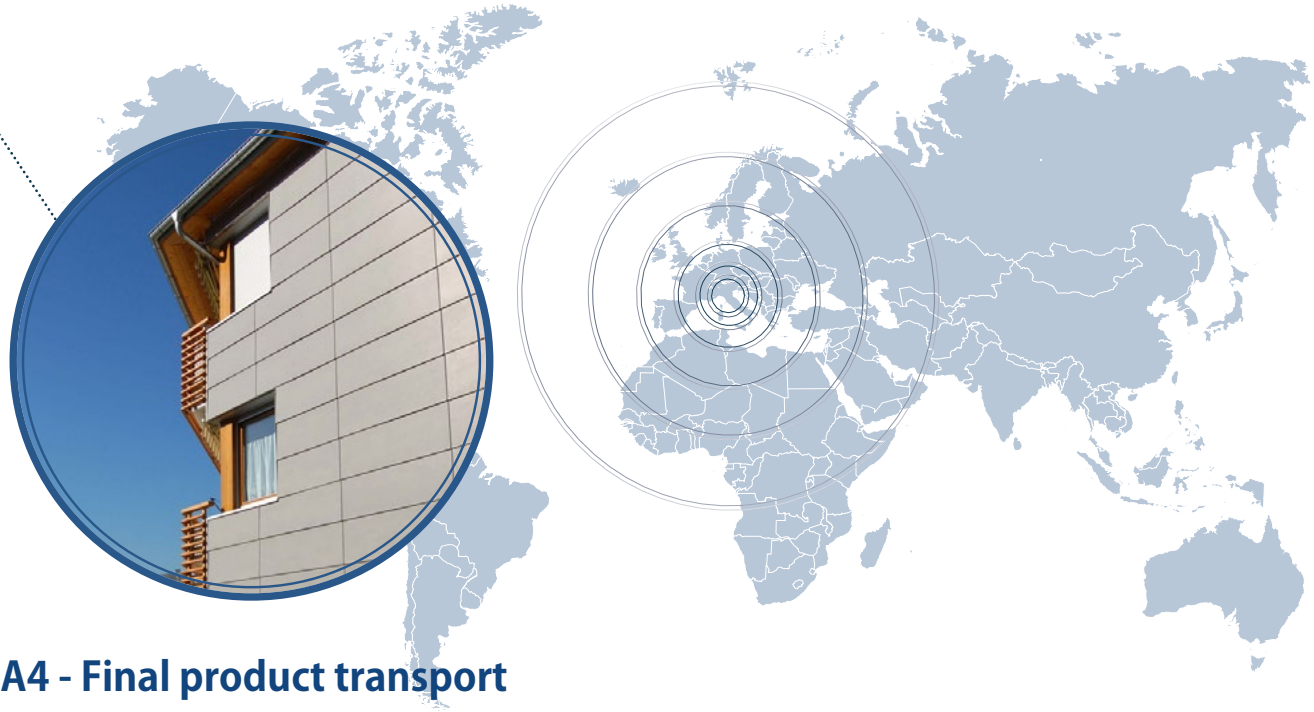
Waste management including transport up to recovery/disposal

7. DOWNSTREAM PROCESSES

Impacts related to transport have been evaluated considering all shipments during year 2013.

Reference distance has been calculated by averaging the distances of each shipment with the weight represented by the quantity transported.

Environmental impacts have been calculated condidering the information coming from Ecoinvent database version 2.2 (*Lorry 16-32t, EURO3* and *Transoceanic freight ship)*.



A4 - Final product transport

8. ENVIRONMENTAL PERFORMANCE (natural or mass color sheet - thickness 4mm)

Results in terms of resource consumption or generated impacts are divided in three phases (upstream, core and downstream) and sub-phases (A1, A2, A3, A4) as requested by the reference PCR.

RENEWABLE RESOURCES	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Use of RENEWABLE primary energy excluding renewable primary energy resources used as raw materials [MJ, net calorific value]	32,94	<0,01	4,18	0,04	**37,16**
Use of RENEWABLE primary energy resources used as raw materials [MJ, net calorific value]	12,27	-	-	-	**12,27**
Total use of RENEWABLE primary energy resources (primary energy and primary energy resources used as raw materials) [MJ, net calorific value]	45,21	<0,01	4,18	0,04	**49,43**

NON RENEWABLE RESOURCES	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Use of NON RENEWABLE primary energy excluding renewable primary energy resources used as raw materials [MJ, net calorific value]	127,8	0,56	2,13	31,64	**162,13**
Use of NON RENEWABLE primary energy resources used as raw materials [MJ, net calorific value]	0,66	<0,01	<0,01	<0,01	**0,66**
Total use of NON RENEWABLE primary energy resources (primary energy and primary energy resources used as raw materials) [MJ, net calorific value]	128,46	0,56	2,13	31,64	**162,79**

USE OF SECONDARY RESOURCES	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Use of secondary material	-	-	-	-	-
Use of renewable secondary fuels [MJ, net calorific value]	-	-	-	-	-
Use of NON renewable secondary fuels [MJ, net calorific value]	-	-	-	-	-

NET USE OF FRESH WATER	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Net use of fresh water [liter]	51,61	0,05	3,11	2,59	**57,35**

WASTE PRODUCTION AND TREATMENT	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Hazardous waste disposed [kg]	-	-	<0,01	-	**<0,01**
Non hazardous waste disposed [kg]	0,02	-	8,93	-	**8,95**
Radioactive waste disposed [kg]	-	-	-	-	**-**

ENVIRONMEMNTAL IMPACT PARAMETERS	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Global Warming Potential, GWP [kg CO_2 eq]	7,50	0,04	2,32	2,21	**12,07**
Ozone Depletion Potential, ODP [mg CFC-11 eq]	0,85	0,01	0,01	0,33	**1,2**
Photochemical Ozone Creation, POCP [g C_2H_4 eq]	3,22	0,04	0,32	1,64	**5,22**
Acidification Potential, AP [g SO_2 eq]	6,52	0,22	0,82	8,93	**16,49**
Eutrophication Potential, EP [g PO_4^{3-} eq]	2,89	0,06	0,22	2,47	**5,64**
Depletion of abiotic resources-elements, ADP-elements [kgSb eq]	<0,01	<0,01	<0,01	<0,01	**<0,01**
Depletion of abiotic resources-fossil, ADP-fossil fuels [MJ]	114,32	0,55	1,93	31,38	**148,18**

8. ENVIRONMENTAL PERFORMANCE (natural or mass color sheet - thickness 5 mm)

Results in terms of resource consumption or generated impacts are divided in three phases (upstream, core and downstream) and sub-phases (A1, A2, A3, A4) as requested by the reference PCR.

RENEWABLE RESOURCES	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Use of RENEWABLE primary energy excluding renewable primary energy resources used as raw materials [MJ, net calorific value]	39,33	<0,01	4,18	0,04	**43,55**
Use of RENEWABLE primary energy resources used as raw materials [MJ, net calorific value]	15,36	<0,01	<0,01	<0,01	**15,36**
Total use of RENEWABLE primary energy resources (primary energy and primary energy resources used as raw materials) [MJ, net calorific value]	54,69	<0,01	4,18	0,04	**58,91**

NON RENEWABLE RESOURCES	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Use of NON RENEWABLE primary energy excluding renewable primary energy resources used as raw materials [MJ, net calorific value]	136,21	0,56	2,13	31,64	**170,54**
Use of NON RENEWABLE primary energy resources used as raw materials [MJ, net calorific value]	0,80	<0,01	<0,01	<0,01	**0,80**
Total use of NON RENEWABLE primary energy resources (primary energy and primary energy resources used as raw materials) [MJ, net calorific value]	137,01	0,56	2,13	31,64	**171,34**

USE OF SECONDARY RESOURCES	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Use of secondary material	-	-	-	-	-
Use of renewable secondary fuels [MJ, net calorific value]	-	-	-	-	-
Use of NON renewable secondary fuels [MJ, net calorific value]	-	-	-	-	-

NET USE OF FRESH WATER	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Net use of fresh water [liter]	60,91	0,05	3,11	2,59	**66,65**

WASTE PRODUCTION AND TREATMENT	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Hazardous waste disposed [kg]	-	-	<0,01	-	**<0,01**
Non hazardous waste disposed [kg]	0,02	-	8,93	-	**8,95**
Radioactive waste disposed [kg]	-	-	-	-	**-**

ENVIRONMEMNTAL IMPACT PARAMETERS	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Global Warming Potential, GWP [kg CO_2 eq]	8,48	0,04	2,32	2,21	**13,05**
Ozone Depletion Potential, ODP [mg CFC-11 eq]	0,90	0,01	0,01	0,33	**1,25**
Photochemical Ozone Creation, POCP [g C_2H_4 eq]	3,54	0,04	0,32	1,64	**5,54**
Acidification Potential, AP [g SO_2 eq]	7,30	0,22	0,82	8,93	**17,27**
Eutrophication Potential, EP [g PO_4^{3-} eq]	3,26	0,06	0,22	2,47	**6,01**
Depletion of abiotic resources-elements, ADP-elements [kgSb eq]	<0,01	<0,01	<0,01	<0,01	**<0,01**
Depletion of abiotic resources-fossil, ADP-fossil fuels [MJ]	120,73	0,55	1,93	31,38	**154,59**

8. ENVIRONMENTAL PERFORMANCE (natural or mass color sheet - thickness 6mm)

Results in terms of resource consumption or generated impacts are divided in three phases (upstream, core and downstream) and sub-phases (A1, A2, A3, A4) as requested by the reference PCR.

RENEWABLE RESOURCES	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Use of RENEWABLE primary energy excluding renewable primary energy resources used as raw materials [MJ, net calorific value]	45,68	<0,01	4,18	0,04	**49,9**
Use of RENEWABLE primary energy resources used as raw materials [MJ, net calorific value]	18,44	<0,01	<0,01	<0,01	**18,44**
Total use of RENEWABLE primary energy resources (primary energy and primary energy resources used as raw materials) [MJ, net calorific value]	64,12	<0,01	4,18	0,04	**68,34**

NON RENEWABLE RESOURCES	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Use of NON RENEWABLE primary energy excluding renewable primary energy resources used as raw materials [MJ, net calorific value]	144,62	0,56	2,13	31,64	**178,95**
Use of NON RENEWABLE primary energy resources used as raw materials [MJ, net calorific value]	0,99	<0,01	<0,01	<0,01	**0,99**
Total use of NON RENEWABLE primary energy resources (primary energy and primary energy resources used as raw materials) [MJ, net calorific value]	145,61	0,56	2,13	31,64	**179,94**

USE OF SECONDARY RESOURCES	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Use of secondary material	-	-	-	-	-
Use of renewable secondary fuels [MJ, net calorific value]	-	-	-	-	-
Use of NON renewable secondary fuels [MJ, net calorific value]	-	-	-	-	-

NET USE OF FRESH WATER	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Net use of fresh water [liter]	70,21	0,05	3,11	2,59	**75,95**

WASTE PRODUCTION AND TREATMENT	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Hazardous waste disposed [kg]	-	-	<0,01	-	**<0,01**
Non hazardous waste disposed [kg]	0,02	-	8,93	-	**8,95**
Radioactive waste disposed [kg]	-	-	-	-	**-**

ENVIRONMEMNTAL IMPACT PARAMETERS	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Global Warming Potential, GWP [kg CO_2 eq]	9,47	0,04	2,32	2,21	**14,04**
Ozone Depletion Potential, ODP [mg CFC-11 eq]	0,95	0,01	0,01	0,33	**1,30**
Photochemical Ozone Creation, POCP [g C_2H_4 eq]	3,87	0,04	0,32	1,64	**5,87**
Acidification Potential, AP [g SO_2 eq]	8,09	0,22	0,82	8,93	**18,06**
Eutrophication Potential, EP [g PO_4^{3-} eq]	3,64	0,06	0,22	2,47	**6,39**
Depletion of abiotic resources-elements, ADP-elements [kgSb eq]	<0,01	<0,01	<0,01	<0,01	**<0,01**
Depletion of abiotic resources-fossil, ADP-fossil fuels [MJ]	127,20	0,55	1,93	31,38	**161,06**

8. ENVIRONMENTAL PERFORMANCE (natural or mass color sheet - thickness 8mm)

Results in terms of resource consumption or generated impacts are divided in three phases (upstream, core and downstream) and sub-phases (A1, A2, A3, A4) as requested by the reference PCR.

	UPSTREAM	CORE		DOWNSTREAM	TOTAL
RENEWABLE RESOURCES	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Use of RENEWABLE primary energy excluding renewable primary energy resources used as raw materials [MJ, net calorific value]	58,35	<0,01	4,18	0,04	**62,57**
Use of RENEWABLE primary energy resources used as raw materials [MJ, net calorific value]	24,57	<0,01	<0,01	<0,01	**24,57**
Total use of RENEWABLE primary energy resources (primary energy and primary energy resources used as raw materials) [MJ, net calorific value]	82,92	<0,01	4,18	0,04	**87,14**

NON RENEWABLE RESOURCES	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Use of NON RENEWABLE primary energy excluding renewable primary energy resources used as raw materials [MJ, net calorific value]	161,32	0,56	2,13	31,64	**195,65**
Use of NON RENEWABLE primary energy resources used as raw materials [MJ, net calorific value]	1,32	<0,01	<0,01	<0,01	**1,32**
Total use of NON RENEWABLE primary energy resources (primary energy and primary energy resources used as raw materials) [MJ, net calorific value]	162,64	0,56	2,13	31,64	**196,97**

USE OF SECONDARY RESOURCES	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Use of secondary material	-	-	-	-	-
Use of renewable secondary fuels [MJ, net calorific value]	-	-	-	-	-
Use of NON renewable secondary fuels [MJ, net calorific value]	-	-	-	-	-

NET USE OF FRESH WATER	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Net use of fresh water [liter]	88,81	0,05	3,11	2,59	**94,55**

WASTE PRODUCTION AND TREATMENT	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Hazardous waste disposed [kg]	-	-	<0,01	-	**<0,01**
Non hazardous waste disposed [kg]	0,03	-	8,93	-	**8,96**
Radioactive waste disposed [kg]	-	-	-	-	**-**

ENVIRONMEMNTAL IMPACT PARAMETERS	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Global Warming Potential, GWP [kg CO_2 eq]	11,43	0,04	2,32	2,21	**16**
Ozone Depletion Potential, ODP [mg CFC-11 eq]	1,05	0,01	0,01	0,33	**1,40**
Photochemical Ozone Creation, POCP [g C_2H_4 eq]	4,52	0,04	0,32	1,64	**6,52**
Acidification Potential, AP [g SO_2 eq]	9,66	0,22	0,82	8,93	**19,63**
Eutrophication Potential, EP [g PO_4^{3-} eq]	4,39	0,06	0,22	2,47	**7,14**
Depletion of abiotic resources-elements, ADP-elements [kgSb eq]	<0,01	<0,01	<0,01	<0,01	**<0,01**
Depletion of abiotic resources-fossil, ADP-fossil fuels [MJ]	139,97	0,55	1,93	31,38	**173,83**

8. PERFORMANCE AMBIENTALI (painted sheet - thickness 8mm)

Results in terms of resource consumption or generated impacts are divided in three phases (upstream, core and downstream) and sub-phases (A1, A2, A3, A4) as requested by the reference PCR.

RENEWABLE RESOURCES	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Use of RENEWABLE primary energy excluding renewable primary energy resources used as raw materials [MJ, net calorific value]	60,45	0,01	4,18	0,04	**64,67**
Use of RENEWABLE primary energy resources used as raw materials [MJ, net calorific value]	24,57	<0,01	<0,01	<0,01	**24,57**
Total use of RENEWABLE primary energy resources (primary energy and primary energy resources used as raw materials) [MJ, net calorific value]	85,02	0,01	4,18	0,04	**89,24**

NON RENEWABLE RESOURCES	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Use of NON RENEWABLE primary energy excluding renewable primary energy resources used as raw materials [MJ, net calorific value]	192,23	0,56	2,13	25,32	**220,24**
Use of NON RENEWABLE primary energy resources used as raw materials [MJ, net calorific value]	1,32	<0,01	<0,01	<0,01	**1,32**
Total use of NON RENEWABLE primary energy resources (primary energy and primary energy resources used as raw materials) [MJ, net calorific value]	193,55	0,56	2,13	25,32	**221,56**

USE OF SECONDARY RESOURCES	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Use of secondary material	-	-	-	-	-
Use of renewable secondary fuels [MJ, net calorific value]	-	-	-	-	-
Use of NON renewable secondary fuels [MJ, net calorific value]	-	-	-	-	-

NET USE OF FRESH WATER	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Net use of fresh water [liter]	147,43	0,05	3,11	2,08	**152,66**

WASTE PRODUCTION AND TREATMENT	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Hazardous waste disposed [kg]	-	-	<0,01	-	**<0,01**
Non hazardous waste disposed [kg]	0,03	-	8,93	-	**8,96**
Radioactive waste disposed [kg]	-	-	-	-	**-**

ENVIRONMEMNTAL IMPACT PARAMETERS	UPSTREAM	CORE		DOWNSTREAM	TOTAL
	A1 Raw material supply	A2 Transport	A3 Production Process	A4 Product distribution	
Global Warming Potential, GWP [kg CO_2 eq]	12,70	0,04	2,86	1,75	**17,35**
Ozone Depletion Potential, ODP [mg CFC-11 eq]	1,24	0,01	0,01	0,25	**1,51**
Photochemical Ozone Creation, POCP [g C_2H_4 eq]	5,80	0,04	0,34	1,76	**7,94**
Acidification Potential, AP [g SO_2 eq]	11,18	0,22	0,91	8,83	**21,14**
Eutrophication Potential, EP [g PO_4^{3-} eq]	5,02	0,06	0,24	2,43	**7,75**
Depletion of abiotic resources-elements, ADP-elements [kgSb eq]	<0,01	<0,01	<0,01	<0,01	**<0,01**
Depletion of abiotic resources-fossil, ADP-fossil fuels [MJ]	167,05	0,56	1,93	25,11	**194,65**

9. REFERENCE

Bibliography

- ISO 14025:2006
- EN 15804:2012
- PCR 2012:01 Constructionproducts and Construction services, Version 2.0, 2015-03-03
- General Programme Instructions 2.0
- Life cycle assessment of flat sheets, version 1.1 (11/03/2015)

For data elaboration the following tools are used:
- software: SimaPro version 8.0.3.14 (http://www.pre-sustainability.com/)
- main database: Ecoinvent version 2.2
- Geographical scope of the EPD: Europe

Environmental Product Declaration on constrution products, registered with different programs or not realized in line with EN 15804 could not be comparable.

Contacts

SIL references for information:
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Technical support: Life Cycle Engineering, Italy (www.lcengineering.eu).

CEN standard EN 15804 served as the core PCR	
PCR:	PCR 2012:01 Construction products and Construction services, Version 2.0, 2015- 03-03
PCR review was conducted by:	The Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via info@environdec.com
Independent verification of the declaration and data, according to ISO 14025:	EPD verification (External)
Third party verifier:	ICMQ SpA, via De Castillia, 10 20124 Milano (www.icmq.it)
Accredited by:	Accredia