INSULATES THE FUTURE

EPD® Environmental Product Declaration

THE INTERNATIONAL EPD SYSTEM

The environmental impacts of this product have been assessed over its whole life cycle. Environmental Product Declaration has been verified by an independent third party.

ODE MEMBRAN Water Proofing Membranes
in accordance with EN15804 and ISO14025
CPC Code: 3794 Waterproofing membranes
Date of Issue: 02.01.2016
Valid Until: 01.01.2021

ECO PLATFORM EPD EN 15804 VERIFIED

ECO EPD Ref. No 00000262

Market Coverage: Worldwide
Declaration Number
S-P-00673

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ODE
INSULATES THE FUTURE

Company Profile

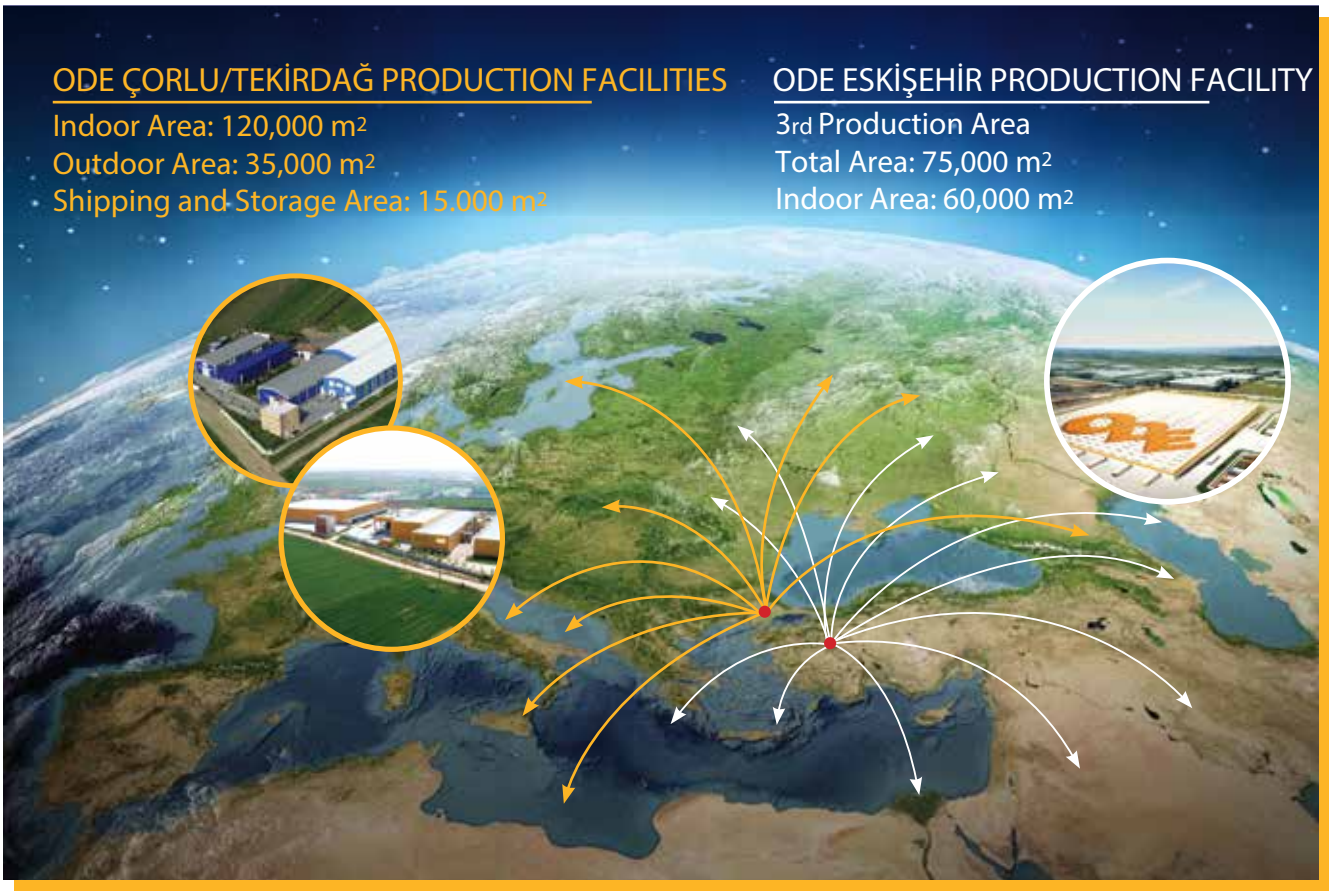
30 Years of Experience in Insulation; ODE

ODE Yalıtım Sanayi ve Ticaret A.Ş. was founded in 1985 to operate as a contractor in construction industry. Becoming an importer in 1990 and a manufacturer in 1996, ODE became a regional power in 2010 with international quality production and widespread dealer network. Today it is among the largest manufacturers of insulation sector with 4 modern production facilities (ODE R-flex Production Facility, ODE Isıpan Production Facility, ODE Membran Production Facility, ODE Starflex Glasswool Production Facility) spread over 120,000 m² outdoor and 35,000 m² indoor area, product range over 4,000 products and expert staff.

Leader in transport and storage with its logistic centre spread over 15,000 m² indoor area, ODE has commissioned its 3rd production base in Eskişehir in 2015, commemorating its 30th year. When the factory, spread over 75 thousand m² area of which 60 thousand m² is indoor area, reaches full capacity it will produce 20 thousand tons of elastomeric rubber foam, 25 million m² membrane and 5 million m² shingle yearly.

Regional Power from Europe to China

The first and only insulation brand to participate TURQUALITY® Support Program, ODE exports to 75 countries on 5 continents ranging from Belgium to Moldova; Australia to Pakistan. With its new facility for elastomeric rubber foam, which will be the largest investment between Europe and Far East, ODE aims to be the largest insulation company of Turkey and the regional powerhouse of Far East-Europe line.



INSULATES THE FUTURE

100% Ozone Friendly and Environmentally Responsible Production

Focusing its works towards the goal of a more habitable world and proving its commitment to this concept with solid works, ODE became the first and only insulation company in 2010, to attend the Umbrella project initiated in Turkey in 2009 with the cooperation of T.R. Ministry of Environment and UNIDO. Having its efforts certified in international platforms by receiving grant from United Nations Industrial Development Organization (UNIDO), ODE has completed its 2 year long research and development studies and has switched to 100% OZONE FRIENDLY production.

Focusing especially to "Efficiency" for a sustainable future to exceed far beyond being a manufacturing supplier, ODE continues to support this goal with innovations in its production. Developing "standard" and "premium" product ranges, ODE provides high quality solutions suiting customer demands. Initiating EPD (Environmental Product Declaration) process for all its brands, ODE will be able to present the environmental performance of its products already registered with quality documents such as ISO, CE, TSE, etc. most transparently with EPD documentation.

Extends the Industry with Its Leading Enterprises and Social Responsibility Consciousness

Taking a lead role in foundation of many associations, especially İZODER, ODE signs leading projects aimed at raising public awareness in insulation and energy efficiency. Striving to take place in works that will leave a legacy, ODE changed company motto to "Insulates the future" in early 2014. Acting with global responsibility that comes with being in the global market, ODE continues to take its place in many international activities and successfully represent Turkish insulation industry and Turkey.

ODE ÇORLU/TEKİRDAĞ PRODUCTION FACILITIES

ODE ESKİŞEHİR PRODUCTION FACILITY

Programme Related Information

EPD Programme Holder	The International EPD System www.environdec.com Valhallavägen 81, 114 27 Stockholm, Sweden
Product Category Rules	2012:01 Version 2.0, 2015-03-03, Construction Products and CPC 54 Construction Services EN 15804:2012 + A1:2013 Sustainability of Construction Works
Generic PCR Review	Technical Committee of the International EPD® System
Independent Verification	☐ Internal ☑ External ☐ EPD® Process Certification
Approved and Verified by	Mr. Vladimir Koci, PhD Šárecká 5, 16000 Prague 6, Czech Republic
EPD Prepared by	Metsims Sustainability Consulting www.metsims.com
Calculation Procedures	SimaPro 8.0 Software (Metsims Sustainability Consulting)
System Boundaries	☐ Cradle to Gate ☑ Cradle to Gate with options ☐ Cradle to Grave
Disclaimer	All values provided in this Environmental Product Declaration are a direct result from the use of characterisation factors and calculation rules as defined in the SimaPro software. The environmental indicators used for these calculations are based on CML Baseline V4.2 April 2013. For more information about this Environmental Product Declaration or its contents, contact process owner, Mrs Derya GÜRBÜZ ILGAZ on d.ilgaz@ode.com.tr
Demonstration of Verification	PCR Review was conducted by: Technical Commitee of EPD International AB. Valhallavägen 81, 114 27 Stockholm, Sweden www.environdec.com info@environdec.com **Independent Verification and data, according to ISO 14025;2006** Internal ☐ ☑ External **Third Party Verifier:** Mr Vladimir Koci, Phd Šárecká 5, 16000 Prague 6, Czech Republic

Statement

The LCA for this EPD is conducted according to the guidelines of ISO 14040/44, the requirements given in the Product Category Rules (PCR) document for Construction Products and CPC 54 Construction Services (Version 2.0, 2015 03 03) with reference to EN 15804 and the general program guidelines by The International EPD System in accordance with ISO 14025 standards.

The inventory for the LCA study is based on the 2014 May - 2015 April production figures for ODE Membran products from ODE's main production plant is located in Çorlu,Turkey. This LCA was modelled with SimaPro 8.0 LCA software using Ecoinvent version 3.01 database and impact factors.

EPD of thermal insulation materials may not be comparable if they do not comply with EN 15804.

This EPD covers the Cradle to Gate with Option (disposal).

The EPD certificate, its background data and the results will be used for business-to-business communications and is expected to be a reliable document for green building designers, architectures, manufacturers of construction products and the other stakeholders in the construction sector to understand the potential environmental impacts caused by ODE Membran products.

Product Specifications

MEMBRAN SERIES

GENERAL FEATURES

ODE OPAL PRM/STD

ODE Opal series of waterproofing membranes incorporates the properties of APP modified bitumine. It is manufactured in berglass and non-woven polyester felt carrier types. It provides affordable solutions for waterproofing details, especially for terrace and groundwork applications.

ODE GRANAT PRM/STD

ODE Granat series of waterproofing membranes incorporates the properties of APP modified bitumine. It is manufactured in berglass and non-woven polyester felt carrier types. It is used with high performance in all waterproofing insulation details,especially for terrace and groundwork applications.

ODE RUBIN PRM/STD

ODE Rubin series of waterproofing membrane incorporates the superior qualities such as ease of application of SBS modified bitumen at low temperatures. It is manufactured in fiberglass and non-woven polyester felt carrier types.

COMPONENTS	AMOUNT, %
BITUMEN AND OILS	40%-60%
POLYOLEPHIN COMPOUNDS	7%-15%
CALCIUM CARBONATE (LIMESTONE)	40%-60%
POLYESTHER NONWOVEN*	1%-2%
FIBERGLASS NONWOVEN*	<1%
INERT ROCK GRANULES AND FLAKES	8%

Compposition of ODE Membran insulation materials -

**There are two types of felt used in bitumen membrane products. For that matter, average amount of each felt is included in composition.*

No component of product is on SVHC list.

APPLICATION AREA

They are used for waterproofing of roof terraces such as conventional terrace roof, inverted terrace roof, trafficable inverted terrace roofs and ventilation shaft, rainwater drainage, parapets and non-trafficable inverted terrace roofs.

TECHNICAL SPECIFICATIONS

PRODUCT	FLEXIBILITY AT LOW TEMPERATURE (0 C) (EN 1109)	REACTION TO FIRE (EN 11925-2)	TENSILE PROPERTIES (N/50 mm) (EN 12311-1)	
			POLYESTER NON-WOVEN	GLASS-FIBBER NON-WOVEN
OPAL STD/PRM	-5	E	600/400	400/300
GRANAT STD/PRM	-10		600/400 -800/600	300/200-400/300
RUBIN STD/PRM	-20		600/400 -800/600	300/200-400/300
LUNA	-5		300/150-400/200	300/150

Technical Specifications of ODE Membran insulation materials

Production Process and System Boundary

System Boundary of the LCA study conducted on ODE Membran

Upstream Processes (A1: Raw Material Supply)

In this report, for membran products production starts with raw materials, mainly locally sourced but some transported from other parts of the world. Raw material supply has the biggest effect on global warming potential due to bitumen usage. Environmental impacts during the production of all raw materials are reflected in this EPD.

Core Processes (A2:Transportation and A3: Manufacturing)

Transport is relevant for delivery of raw materials to the plant and internal transport within the manufacturing plant for each product group.

Production stages start with mixing and continues with the coating, cooling, rolling and finished with the packaging process. Consumed natural gas and electricity is taken into account during the modelling the manufacturing stage of the product.

Downstream Processes (C4: Disposal)

For membrane products, relevant disposal scenarios are modelled by taking into consideration the fate of the construction and packaging wastes in Turkey. All construction products disposed into a C&D landfill, which is modelled as such in this LCA. Packaging waste is assumed to end up at packaging recycling streams due to the relevant national law in Turkey in 2014, which requires manufacturers to have certain percentage of their packaging waste to be recovered (C4).

Benefits and loads beyond the product system boundary in information Module D

No potential benefits of recycling and re-use were taken into account in the LCA work here.

LCA Calculation Rules

Functional Unit	The functional unit for ODE Membran is 1 m2 bitumen membrane.
Goal and Scope	The EPD evaluates the environmental impacts of 1 m2 of ODE Membran bitumen membrane products.
System Boundaries	The system boundary covers A1-A3 product stages reffered as 'Raw Material Supply', 'Transport' and 'Manufacturing' and C4 as Disposal.
Estimates and Assumptions	There are no additional product scenerio developed for this EPD. Packaging waste is modelled based on the enforced collection rates in Turkey at the time.
Cut-Off Rules	1% cut-off rule is applied to raw materials less than 1% in the composition but making sure their total is below this threshold.
Background Data	Ecoinvent database were used as generic background data source.
Data Quality	Raw materials, electricity, water use and waste data were were collected from ODE.
Period Under Review	This data is representative of 2014 May - 2015 April production figures for bitumen membrane products.
Allocations	There are no co-producs in the production of ODE Membran. Hence, there is no need for co-product allocation. Transport is allocated according to tonnages for almost all raw materials bought by ODE. For the manufacturing of bitumen membrane products, no allocation for energy consumption or water consumption was made as the product specific data was available. There is no water consumption during the manufacturing of ODE Membran.
Comperability	A comparision or an evaluation of EPD data is only possible where EN 15804 has been followed, and the same building context and product-specific characteristics of performance are taken into account and the same stages have been included in the system boundary. According to EN 15804, EPD of construction products may not be comperable if they do not comply with the standards.

LCA Results

ENVIRONMENTAL IMPACTS

During the modeling, all values are taken into account for 1 m2 of ODE Membran bitumen membrane products.

PRODUCT STAGE			CONSTRUCTION PROCESS		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw Materials Supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction	Transport	Waste processing	Disposal	Reuse-Recycling-Recovery 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	X	MND

The results of the LCA with the indicators as per EPD requirement are given in the following tables for product manufacture (A1, A2, A3) and the loads beyond the system boundaries (C4). The system boundaries in tabular form for all modules are shown in the table above.

All energy calculations were obtained using Cumulative Energy Demand methodology, while environmental impacts are calculated with the CML-IA baseline V4.2 within SimaPro.

There are 3 types of membrane products; Rubin, Opal and Granat. The environmental impact of these products are given for an average composition.

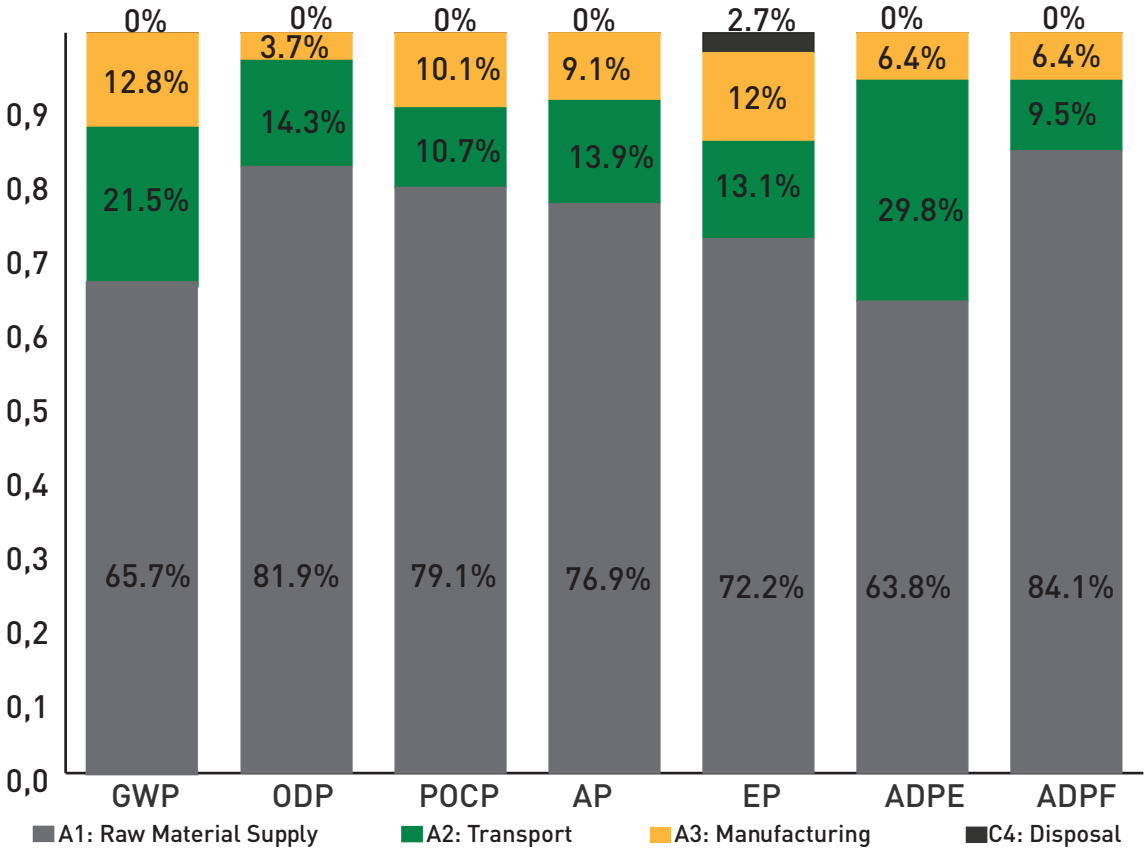
MEMBRAN

ENVIRONMENTAL IMPACTS FOR 1 M^2 OF ODE MEMBRAN			
Parameter	Unit	A1-A3	C4
GWP	[kg CO_2 eq.]	1.73	0.000435
ODP	[kg CFC11 eq.]	4.71E-07	1.09E-11
POCP	[kg ethene eq.]	6.17E-04	8.84E-08
AP	[kg SO_2 eq.]	8.82E-03	3.11E-07
EP	[kg PO_4^{3-} eq.]	4.34E-03	2.04E-05
ADPE	[kg Sb eq.]	3.35E-06	5.54E-11
ADPF	[MJ eq.]	6.17E+01	1.06E-03
Legend	GWP: Global Warming Potential, ODP: Ozone Depletion Potential, AP: Acidification Potential, 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		

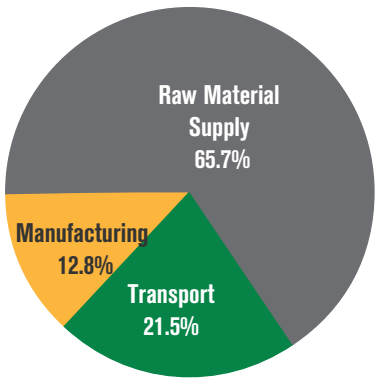
RESOURCE USE FOR 1 M^2 OF ODE MEMBRAN			
Parameter	Unit	A1-A3	C4
PERE	[MJ]	6.12E+00	3.01E-05
PERM	[MJ]	0	0
PERT	[MJ]	6.12E+00	3.01E-05
PENRE	[MJ]	6.17E+01	1.06E-03
PENRM	[MJ]	0	0
PENRT	[MJ]	6.17E+01	1.06E-03
SM	[kg]	0	0
RSF	[MJ]	0	0
NRSF	[MJ]	0	0
FW	[m^3]	9.77E-03	1.09E-06
Legend	PERE: Use of renewable primary energy excluding 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 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		

OUTPUT FLOWS AND WASTE CATEGORIES FOR 1 M^2 OF ODE MEMBRAN			
Parameter	Unit	A1-A3	C4
HWD	[kg]	6.53E-05	0
NHWD	[kg]	0	3.77E+00
RWD	[kg]	0	0
CRU	[kg]	3.85E-02	7.70E-02
MFR	[kg]	6.30E-02	6.76E-02
MER	[kg]	0	0
EE [Typ]	[MJ]	0	0
Legend	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: Ecported Energy		

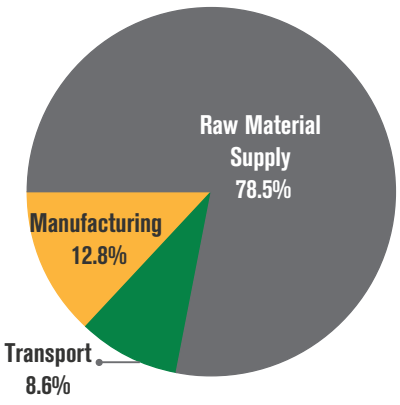
ENVIRONMENTAL INTERPRETATION



Among all impact categories raw material supply (A1) represents the life cycle stage with the biggest impact. The GWP of raw material supply is 66%, while transport has about 22% of the total carbon emissions followed by manufacturing with 13%. The end of life of ODE Membran products manufactured by ODE Insulation has little or no effect on GWP.



Global Warming Potential (IPCC GWP100a) of ODE Membran



Total energy contributions to each life cycle stage for ODE Membran

A1: Raw Material Supply
A2: Transport
A3: Manufacturing
C4: Disposal

Verification & Registration Contacts

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References

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/EN 1109/ Flexible sheets for waterproofing. Bitumen sheets for roof waterproofing. Determination of flexibility at low temperature.

/EN ISO 11925-2/ Reaction to fire tests. Ignitability of products subjected to direct impingement of flame. Single-flame source test

/EN 12311-1/ Flexible sheets for waterproofing. Determination of tensile properties. Bitumen sheets for roof waterproofing

/EN 13707/ Flexible sheets for waterproofing. Reinforced bitumen sheets for roof waterproofing. Definitions and characteristics

/EN 13969/ Flexible sheets for waterproofing. Bitumen damp proof sheets including bitumen basement tanking sheets. Definitions and characteristics

/TS 11758-1/ Polymer bitumen sheeting - For use in waterproofing - Applied by fusion welding - Part 1: Specifications

/ISO 14025/ DIN EN ISO 14025:2009-11: Environmental labels and declarations - Type III environmental declarations — Principles and procedures

/ISO 14040-44/ DIN EN ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework (ISO 14040:2006) and Requirements and guidelines (ISO 14044:2006)

/ISO 14020/ Environmental labels and declarations -- General principles

/GPI/ General Programme Instructions

/PCR for Insulation Materials, The International EPD System/ Prepared by Life Cycle Engineering srl, 2014:13 Version 1.0, DATE 2014-04-16

/The International EPD® System/ The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025.www.environdec.com

/Ecoinvent / Ecoinvent Centre, www.Eco-invent.org

/SimaPro/ SimaPro LCA Package, Pré Consultants, the Netherlands, www.pre-sustainability.com