

# ENVIRONMENTAL PRODUCT DECLARATION

## IN ACCORDANCE WITH ISO 14025 AND EN 15804



## PROPLEXRE

### TEMPORARY BUILDING PROTECTIONS



**Declaration number: S-P-002270**  
**Version 2.0**

Issued on 2020-10-16  
Revised on 2021-09-22  
Valid until 2025-10-06

The environmental impacts of this product have been assessed from cradle to gate with options.

This Environmental Product Declaration has been verified by an independent third party.

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

# Introduction



This EPD provides environmental performance indicators for **ProplexRE** range of fire-resistant temporary building protection materials manufactured by Protec International Ltd. This is a cradle-to-gate with options EPD in accordance with the requirements of EN 15804, covering modules A1 - A3, A4, A5, C and D defined in that standard.

The EPD is based on a life cycle assessment (LCA) study which used production data for 2019 - 2020 from Protec's manufacturing facilities in Sheffield, UK. Background data were taken from the ecoinvent database (v3.6). The update to version 2.0 reflects a large increase to the recycled content.

The EPD presents details of the LCA, a description of the product life cycle it covers, values for the environmental indicators specified by EN 15804 and a brief explanation of those results.

The declared unit is 1 square metre (1m<sup>2</sup>) of **ProplexRE** temporary building protection.

## ProplexRE temporary building protection EPD

EPD programme	The International EPD® System
EPD programme operator	EPD International AB - Stockholm - Sweden www.environdec.com
EPD owner	Protec International Ltd Construction House, Adlington Industrial Estate, Adlington, Cheshire, SK10 4NL - UK <a href="https://www.protection.co.uk/">https://www.protection.co.uk/</a>
Product name	<b>ProplexRE</b>
CPC code	3633
Declared unit	1 square metre (1m <sup>2</sup> )
System boundaries	Cradle-to-gate with options
Declaration No	S-P-02270 Version 2.0
Date of publication	2020-10-16
Date of revision	2021-09-22
EPD valid until	2025-10-16
Procedure for data follow-up during EPD validity	involves third party Verifier: yes <input type="checkbox"/> no <input checked="" type="checkbox"/>
EPD geographical scope	Europe
EPD based on Product Category Rules	The CEN standard EN 15804 serves as the core PCR The International EPD® System's PCR 2019:14 Construction products, version 1.1, 2020-09-14
PCR review conducted by	The Technical Committee of the International EPD® System Chair: Claudia Peña; contact via <a href="mailto:info@environdec.com">info@environdec.com</a>
Verification	Independent verification of this EPD and data, according to ISO 14025/2006: <input type="checkbox"/> internal certification <input checked="" type="checkbox"/> external verification
Third party verifier	Jane Anderson, Recognized Individual Verifier ConstructionLCA Ltd, UK 
Accredited or approved by:	The International EPD® System
LCA conducted by:	EuGeos Limited - <a href="http://www.eugeos.co.uk">www.eugeos.co.uk</a> <a href="mailto:epd@eugeos.co.uk">epd@eugeos.co.uk</a> 

EPDs within the same product category but from different programmes may not be comparable.

EPDs of construction products may not be comparable if they do not comply with EN 15804.

For further information about comparability, see EN 15804 and ISO 14025.

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# Company profile

## OUR STORY

With over 26 years' experience, Protec International Ltd are Europe's leading manufacturer and supplier of Temporary Protection Materials, used to protect expensive fixtures and fittings, for the construction industry.

We offer a comprehensive range of flame retardant and standard protection solutions that cover every stage of your project, from site set-up to handover and completion.

Our Temporary Protection products enable you to:

- Reduce accidental damage on site
- Save time and money
- Deliver defect-free homes
- Avoid disruption to your build schedule
- Prevent numerous visits to site for remedial repairs

We're proud to be the only direct supplier of Temporary Protection materials with a UK-based manufacturing plant. Buying from us provides the following benefits:

- Our products are made in Britain to British standards – Keeps transport costs down.
- Largest UK manufacturer of Polypropylene sheets for the construction industry - High level of control over quality and costs.
- State-of-the-art warehouse with 8000 pallet spaces - No supply chain risk.
- High stock levels - Reduced delivery times.
- In house printing facilities - Greater control over print quality and costs.
- In house cutting facility - Allows us to make specialist items to order.
- Whatever challenge you are facing on site - We are just a call away.
- We deliver confidence - You know what you are getting and where it is from.

We are dedicated to raising standards and quality and we've won numerous professional awards and achieved accreditations in recognition of our stringent standards and performance:

- ISO 9001:2015 accreditation for our quality and efficiency management system, LPCB certificate 843QMS.
- ISO 14001:2015 accreditation for our environmental management system, LPCB certificate 843EMS.
- Achilles Building Confidence Advanced Member for our excellence in supply chain management, safety and environmental processes.
- Gold rating as a Considerate Constructor Supplier and Supplier Runner Up of the Year for 2017 and 2018 for our responsibility towards safety on construction sites and contributions to the industry's good reputation.
- Constructionline Registered Supplier (silver), assessed to government and industry standards (PAS 91).
- Gold award from Supply Chain Sustainability for our commitment to environmental and social sustainability issues within the construction industry supply chain.
- MRW National Recycling Awards Winner 2019 for ClosedLoop Re-manufacturing Scheme.
- Business Green Leaders Awards Finalist 2019.



As a manufacturer, we recognise our corporate responsibility to reduce plastic waste. We are proud to have developed the first end-of-life ClosedLoop Re-manufacturing Scheme for Temporary Protection materials, which recovers used Proplex and reprocesses it back through our re-manufacturing cycle, producing new Proplex sheets. This enables construction sites to responsibly and efficiently return used materials back to Protec for recycling and re-manufacturing, and contribute to a more sustainable future.

## CONTACT

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## Product information - ProplexRE

This EPD applies to Protec's polypropylene-based **ProplexRE** range of temporary building protections (pictured below).

**ProplexRE** is a twin-wall, impact-resistant flame-retardant and waterproof temporary building protection material manufactured from 65% post-consumer recycled polypropylene and is recyclable via our Closed Loop Re-Manufacturing Scheme. It is available in sheets in several thicknesses and sizes to protect floors, door & window walling and even worktops.

**ProplexRE** temporary building protection is classified CPC 3633 under the UN CPC classification system v2.1.



ProplexRE sheet

### MANUFACTURING

At the start of the manufacturing process, new and recycled polymer are blended in the correct proportions with additives that aid processing or ensure the technical performance of the finished product. The blend passes through a sheet extruder that gives the product its final form. Logos or images are printed in-line before the finished sheets are cut to size.

### PACKAGING

Proplex sheets are stacked on wooden pallets, retained using plastic strapping, for storage in our warehouse and delivery to distributors and large users. The wooden pallet accounts for 99% of the packaging by mass, at approximately 10g total and 4g biogenic C per declared unit.

### TRANSPORTATION

Proplex is delivered to customers by road. A significant proportion is shipped to builders' merchants and other distributors.

### PRODUCT USE AND MAINTENANCE

Proplex is typically laid over the surface to be protected and held in place with adhesive tape. No maintenance activities are required during the product's use.

### END-OF-LIFE

After use, the adhesive tape used to hold Proplex in place is assumed to be disposed of as waste as part of the removal process. Some used Proplex product is disposed of with mixed construction wastes; a fraction of this will be segregated in the waste treatment system for recycling into other polypropylene items. Some Proplex is segregated by users instead of being mixed with other construction wastes; this material may be recycled through third-party recycling routes, or returned to Protec via our Proplex ClosedLoop Re-manufacturing Scheme.

As wastes, Proplex materials fall under European Waste Catalogue (EWC) code 17 02 03



## REFERENCE SERVICE LIFE

No reference service life is specified in this cradle-to-gate with options EPD.

## FURTHER PRODUCT INFORMATION

Detailed product information and datasheets can be found

- on our website <https://www.protec.co.uk>
- or by contacting Customer Service by telephone: 0800 834 704
- or by email: [enquiries@protec.co.uk](mailto:enquiries@protec.co.uk)

## CONTENTS DECLARATION

The material composition of PROTEC's **ProplexRE** temporary polymeric building protections is shown below:

Material	% of mass per declared unit
Polypropylene (new)	25 - 27
Polypropylene (recycled)	64 - 66
Fire retardant	2 - 4
Inert inorganic additives	5 - 7

No substance included in the Candidate List of Substances of Very High Concern for authorisation under the REACH Regulations is present in the protection materials, either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

## TECHNICAL DATA

Proplex products are intended for use as temporary protections during construction and maintenance of buildings.

Key product properties are shown in the table below; consult the relevant product data sheet for a comprehensive specification.

Product	Colour	Thickness (mm)	Mass per m <sup>2</sup> (g)	Effective bulk density (kg.m <sup>-3</sup> )
ProplexRE	grey	2	250	125
ProplexRE	grey	3	350	117
ProplexRE	grey	4	700	175

Suitable where non-combustible materials are specified in accordance with local building regulations. Tested to LPS 1207

## RESIDUAL RISKS AND EMERGENCIES

There are no residual risks associated with the normal day-to-day use of PROTEC's temporary polymeric protections. Care must be taken to use the materials in accordance with PROTEC's guidance.

# Environmental performance-related information

## LCA INFORMATION

This section of the EPD records key features of the LCA on which it is based.

### SCOPE

This EPD covers the production, construction process and end-of-life stages (modules A1-A3, A4; C1-C4 & D; see below). Proplex products are passive in use, therefore the use stage is omitted. As permitted by EN 15804; modules A1-A3 are declared in aggregated form.

Product stage			Construction process stage		Use stage							End of life stage				Benefits & loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste treatment	Disposal	Reuse-recovery- recycling-potential
A 1	A 2	A 3	A 4	A 5	B 1	B 2	B 3	B 4	B 5	B 6	B 7	C 1	C 2	C 3	C 4	D
X	X	X	X	X	N D	N D	N D	N D	N D	N D	N D	X	X	X	X	X

X: included in LCA; ND: module not declared

### DECLARED UNIT

The declared unit is 1 square metre of **ProplexRE** temporary building protection material.

### SYSTEM BOUNDARIES

The system boundary of the EPD is defined using the modular approach set out in EN 15804.

As well as the core processes which cover manufacture of the protection materials at Protec's Sheffield site, the system includes production of all raw materials and components from basic resources; transport of those materials at all stages up to users' sites; the production of fuels and energy carriers and their delivery to manufacturing sites; the treatment of all wastes and the management of product at the end of its life, including final disposal.

The original production of recycled material inputs that have passed the end-of-waste state is outside the system boundary.

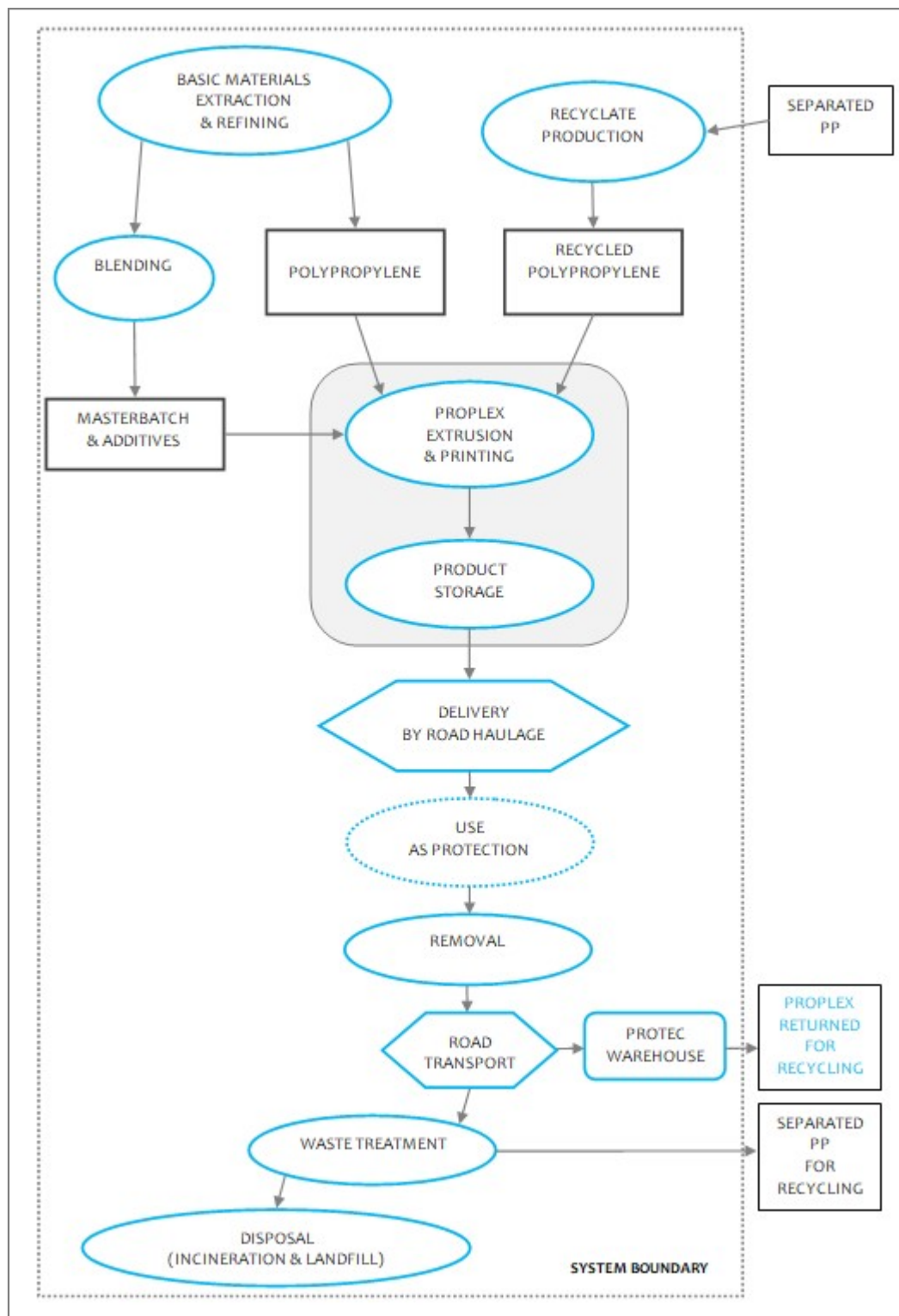
The product life cycle covered by this EPD is illustrated below.

### CUT-OFF CRITERIA

The collected data covered all raw materials, consumables and packaging materials; associated transport to the manufacturing site; process energy and water use; direct production wastes; emissions to air and water.

According to EN 15804 and the PCR, flows can be omitted (cut off) from a core process in the LCA up to a maximum of 1% of the total mass of material inputs or 1% of the total energy content of fuels and energy carriers; various functional additives amounting, in combination, to <0.1% of total input materials were omitted from the LCA underpinning this EPD.





ProplexRE life-cycle

## DATA SOURCES AND DATA QUALITY

Data characterising the core processes (Proplex manufacture) were collected for a contiguous 12-month period between 1 March 2019 and 29 February 2020.

The data have been updated within the last 5 years. These data were checked to ensure that sufficient materials and water are included within the inputs to account for all products, wastes and emissions.

### BACKGROUND DATA

Background (generic) data were taken from the ecoinvent database (v3.6); this fulfils the EN 15804 requirement that generic data used in the LCA have been updated within the last 10 years.

Data quality has been reviewed for selected generic datasets and judged fit for purpose. No environmental impact potential stemming from proxy data exceeds 10% for any impact category.

## ALLOCATION

Background data is taken from the "cut-off" version of the ecoinvent database. This ensures that secondary materials are free of upstream burdens that arise prior to their reaching the "end of waste" state, in accordance with Section 6.3.4.2 of EN 15804.

## ASSUMPTIONS AND ESTIMATES

Inputs to and outputs from the system are accounted for over a 100-year time period; long-term emissions are therefore omitted from the impact assessment step in the LCA.

The "primary energy used as material" indicators (PERM; PENRM) are calculated using - as characterisation factors - published values for constituent materials which can yield energy on combustion, where available, and from published calorific values where PEM values are not available. Calculations of PERM use an NCV of 47.7MJ/kg for polypropylene and 14MJ/kg for wood (used as packaging). Printing inks were omitted from the PERM and PENRM calculations.

"Primary energy as fuel" indicators (PENRE, PERE) are calculated as the total primary energy demand minus primary energy used as material.

Delivery of the product to users' sites and transport to waste treatment are characterised using scenarios. The relevant parameters are shown in the tables below.

In the end-of-life modules, the post-consumer recycling rate applied is 20.8% of all Proplex arising, via all routes. Of the remaining fraction, 59.3% is assumed incinerated and 40.7% landfilled, reflecting UK practice. Approximately 2/3 of waste incineration includes energy recovery; the efficiency of this is assumed to be 32%, and the resulting energy output reported as "Exported Energy" (EE) in module C4.

Scenario parameters - Transport to site	
Parameter	Quantity (unit)
Vehicle type	lorry
Vehicle load capacity	16t
Fuel type and consumption	diesel, 0.1 (l/km)
Volume capacity utilisation factor	1
Capacity utilisation (including empty returns)	38% (in generic data)
Distance to site	250 (km)
Bulk density of transported products	see Technical Data (kg/m <sup>3</sup> )

Scenario parameters - Transport to waste treatment	
Parameter	Quantity (unit)
Vehicle type	lorry
Vehicle load capacity	10t
Fuel type and consumption	diesel, 0.1 (l/km)
Volume capacity utilisation factor	1
Capacity utilisation (including empty returns)	33% (in generic data)
Distance to waste treatment site	50 (km)
Bulk density of transported products	see Technical Data (kg/m <sup>3</sup> )

The recycling rate for polypropylene applied in the Module D calculation is 22.7%, encompassing both post-consumer recycling and recycling from the product stage.

## LCA INTERPRETATION

The manufacture of virgin polypropylene and fire retardant additives used in the product represent the most significant part of the life cycle.

For the GWP total indicator (carbon footprint), the product's end-of-life is also significant, because some waste product is assumed to be incinerated, reflecting current UK waste management practice. When incinerated, fossil hydrocarbons in the product itself are released as CO<sub>2</sub> with some energy recovered in the process, which is reported as Exported Energy (EE) in Module C4. The use of this energy (as heat and power) may avoid other environmental burdens associated with heat and power production from primary fuels in other product systems, but assessment of such benefits from waste incineration is outside the scope of EPD compliant with EN 15804.

Module D indicates "the potential benefits of avoided future use of primary materials and fuels while taking into account the loads and processes associated with recycling and recovery processes beyond the system boundary". Module D therefore quantifies the potential benefits of recycling material in any future product - whether or not it is Proplex.

The benefits reported in Module D are calculated for **net** flows of secondary materials across the system boundary (materials to be recycled leaving the system minus recycled materials used in manufacture, and other modules declared in the EPD). As a result of this convention, no benefits are reported in Module D when the proportion of recycled material in the product exceeds the current recycling rate for the constituent materials, as is the case for **ProplexRE**. Nevertheless, Proplex RE should be recycled, if possible via Protec's ClosedLoop Re-manufacturing Scheme, to increase the availability of recycled polypropylene.

## ENVIRONMENTAL INDICATORS AND INTERPRETATION

This EPD contains environmental information about **ProplexRE** temporary building protections, in the form of quantitative indicator values for a number of parameters, which encompass calculated environmental impact potentials, resource and energy use, and waste generation. The parameters are listed below along with the abbreviations used for them in the tables of indicator values that follow.

Parameter	Abbreviation	Units
<b>Environmental impacts</b>		
Climate change – GWP fossil	GWP-fossil	kg CO <sub>2</sub> eq
Climate change – GWP biogenic	GWP-biogenic	kg CO <sub>2</sub> eq
Climate change – GWP land transformation	GWP-luluc	kg CO <sub>2</sub> eq
Climate change – GWP total	GWP-total	kg CO <sub>2</sub> eq
Climate change - GWP fossil & land transformation <sup>1</sup>	GWP-GHG	kg CO <sub>2</sub> eq
Acidification potential	AP	mol H <sup>+</sup> eq
Eutrophication – freshwater	EP-freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq
Eutrophication – marine	EP-marine	kg N eq
Eutrophication – terrestrial	EP-terrestrial	mol N eq
Photochemical ozone formation	POCP	kg NMVOC eq
Ozone depletion	ODP	kg CFC-11 eq
Depletion of abiotic resources – minerals & metals <sup>2</sup>	ADPMM	kg Sb eq
Depletion of abiotic resources – fossil fuels <sup>2</sup>	ADPFF	MJ, ncv
Water (user) deprivation potential <sup>2</sup>	WDP	m <sup>3</sup> world-eq deprived
<b>Resource use</b>		
Renewable primary energy as energy carrier	PERE	MJ
Renewable primary energy resources as material utilisation	PERM	MJ
Total renewable primary energy use (sum of the two parameters above)	PERT	MJ
Non-renewable primary energy as energy carrier	PENRE	MJ
Non-renewable primary energy resources as material utilisation	PENRM	MJ
Total non-renewable primary energy use (sum of the two parameters above)	PENRT	MJ
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ
Use of non-renewable secondary fuels	NRSF	MJ
Net use of fresh water	FW	m <sup>3</sup>
<b>Wastes</b>		
Hazardous waste disposed	HWD	kg
Non-hazardous waste disposed	NHWD	kg
Radioactive waste disposed	TRWD	kg
<b>Output flows</b>		
Components for re-use	CFR	kg
Materials for recycling	MFR	kg
Materials for energy recovery	MER	kg
Exported energy	EE	MJ

<sup>1</sup> - GWP-GHG includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN15804:2012+A1:2013

<sup>2</sup> - The results of this environmental impact indicator shall be used with care because either the uncertainties associated with the results are high or there is limited experience with the indicator

## ProplexRE FR 2mm

Environmental indicator results for all declared modules are shown in the following tables for the declared unit of 1m<sup>2</sup> of **ProplexRE FR 2mm**; the A1 - A3 modules are shown on an aggregated basis.

ProplexRE FR 2mm	ENVIRONMENTAL IMPACTS	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
	GWP-fossil	kg CO <sub>2</sub> eq	3.59E-01	1.25E-02	2.06E-01	9.00E-02	6.42E-03	0.00E+00	3.10E-01	0.00E+00
	GWP-biogenic	kg CO <sub>2</sub> eq	-1.60E-02	0.00E+00	1.83E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-luluc	kg CO <sub>2</sub> eq	4.70E-04	5.14E-06	1.70E-04	9.66E-06	3.59E-06	0.00E+00	1.05E-06	0.00E+00
	GWP-total	kg CO <sub>2</sub> eq	3.43E-01	1.25E-02	2.25E-01	9.00E-02	6.42E-03	0.00E+00	3.10E-01	0.00E+00
	GWP-GHG	kg CO <sub>2</sub> eq	3.59E-01	1.25E-02	2.06E-01	9.00E-02	6.42E-03	0.00E+00	3.10E-01	0.00E+00
	AP	mol H <sup>+</sup> eq	1.67E-03	2.94E-05	9.31E-04	6.31E-05	1.60E-05	0.00E+00	4.24E-05	0.00E+00
	EP-freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq	8.23E-06	1.03E-06	6.26E-05	4.12E-06	6.79E-07	0.00E+00	5.04E-07	0.00E+00
	EP-marine	kg N eq	3.40E-04	4.05E-06	1.71E-04	2.81E-05	2.22E-06	0.00E+00	5.06E-05	0.00E+00
	EP-terrestrial	mol N eq	3.53E-03	4.28E-05	1.84E-03	1.60E-04	2.33E-05	0.00E+00	2.10E-04	0.00E+00
	POCP	kg NMVOC eq	1.13E-03	2.09E-05	5.51E-04	4.29E-05	1.08E-05	0.00E+00	5.27E-05	0.00E+00
	ODP	kg CFC-11 eq	3.44E-08	2.79E-09	8.34E-08	3.00E-09	1.37E-09	0.00E+00	5.38E-10	0.00E+00
	ADPMM	kg Sb eq	4.83E-06	4.13E-07	4.45E-06	5.05E-07	3.16E-07	0.00E+00	5.65E-08	0.00E+00
	ADPFF	MJ, ncv	8.16E+00	1.85E-01	4.39E+00	1.55E-01	9.42E-02	0.00E+00	5.18E-02	0.00E+00
	WDP	m <sup>3</sup> world-eq deprived	4.38E+00	2.09E-01	3.82E+00	3.13E-01	1.48E-01	0.00E+00	2.12E-02	0.00E+00

ProplexRE FR 2mm	RESOURCE USE	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	2.54E-01	3.02E-03	1.55E-01	1.25E-02	2.04E-03	0.00E+00	9.50E-04	0.00E+00
	PERM	MJ	1.32E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	3.87E-01	3.02E-03	1.55E-01	1.25E-02	2.04E-03	0.00E+00	9.50E-04	0.00E+00
	PENRE	MJ	-1.69E+00	1.89E-01	2.76E+00	1.65E-01	9.71E-02	0.00E+00	5.28E-02	0.00E+00
	PENRM	MJ	1.09E+01	0.00E+00	1.89E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	9.17E+00	1.89E-01	4.65E+00	1.65E-01	9.71E-02	0.00E+00	5.28E-02	0.00E+00
	SM	kg	1.67E-01	8.70E-05	9.01E-04	6.22E-05	5.95E-05	0.00E+00	6.35E-05	0.00E+00
	RSF	MJ	6.69E-03	1.10E-04	3.92E-03	2.00E-04	7.40E-05	0.00E+00	1.84E-05	0.00E+00
	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	FW	m <sup>3</sup>	2.45E-03	1.53E-05	1.86E-03	3.82E-03	1.01E-05	0.00E+00	3.72E-05	0.00E+00

ProplexRE FR 2mm	WASTES	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	1.89E-02	2.10E-04	1.32E-02	2.29E-02	1.40E-04	0.00E+00	2.18E-03	0.00E+00
	NHWD	kg	3.60E-01	1.29E-02	3.16E-01	8.62E-02	5.95E-03	0.00E+00	2.03E-01	0.00E+00
	TRWD	kg	2.23E-05	1.28E-06	5.33E-06	7.10E-07	6.37E-07	0.00E+00	1.79E-07	0.00E+00
	OUTPUT FLOWS	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
	CFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	MFR	kg	9.60E-04	7.13E-05	6.21E-04	4.79E-05	4.78E-05	0.00E+00	6.19E-05	0.00E+00
	MER	kg	6.84E-05	0.00E+00	4.09E-05	2.13E-06	8.25E-07	0.00E+00	2.07E-07	0.00E+00
	EE	MJ	0.00E+00	0.00E+00	1.01E-02	0.00E+00	0.00E+00	0.00E+00	1.01E+00	0.00E+00



## ProplexRE FR 3mm

Environmental indicator results for all declared modules are shown in the following tables for the declared unit of 1m<sup>2</sup> of **ProplexRE FR 3mm**; the A1 - A3 modules are shown on an aggregated basis.

ProplexRE FR 3mm	ENVIRONMENTAL IMPACTS	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
	GWP-fossil	kg CO <sub>2</sub> eq	4.98E-01	1.74E-02	2.07E-01	9.00E-02	8.99E-03	0.00E+00	4.34E-01	0.00E+00
	GWP-biogenic	kg CO <sub>2</sub> eq	-1.48E-02	0.00E+00	1.83E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-luluc	kg CO <sub>2</sub> eq	5.30E-04	7.18E-06	1.70E-04	9.66E-06	5.03E-06	0.00E+00	1.48E-06	0.00E+00
	GWP-total	kg CO <sub>2</sub> eq	4.84E-01	1.74E-02	2.26E-01	9.00E-02	8.99E-03	0.00E+00	4.34E-01	0.00E+00
	GWP-GHG	kg CO <sub>2</sub> eq	4.99E-01	1.74E-02	2.08E-01	9.00E-02	8.99E-03	0.00E+00	4.34E-01	0.00E+00
	AP	mol H <sup>+</sup> eq	2.33E-03	4.11E-05	9.31E-04	6.31E-05	2.24E-05	0.00E+00	5.94E-05	0.00E+00
	EP-freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq	1.13E-05	1.44E-06	6.26E-05	4.12E-06	9.51E-07	0.00E+00	7.06E-07	0.00E+00
	EP-marine	kg N eq	4.70E-04	5.66E-06	1.71E-04	2.81E-05	3.11E-06	0.00E+00	7.08E-05	0.00E+00
	EP-terrestrial	mol N eq	4.92E-03	5.99E-05	1.84E-03	1.60E-04	3.26E-05	0.00E+00	2.94E-04	0.00E+00
	POCP	kg NMVOC eq	1.58E-03	2.92E-05	5.51E-04	4.29E-05	1.51E-05	0.00E+00	7.37E-05	0.00E+00
	ODP	kg CFC-11 eq	4.79E-08	3.90E-09	8.34E-08	3.00E-09	1.92E-09	0.00E+00	7.54E-10	0.00E+00
	ADPMM	kg Sb eq	6.73E-06	5.77E-07	4.46E-06	5.05E-07	4.42E-07	0.00E+00	7.91E-08	0.00E+00
	ADPFF	MJ, ncv	1.14E+01	2.59E-01	4.40E+00	1.55E-01	1.32E-01	0.00E+00	7.25E-02	0.00E+00
	WDP	m <sup>3</sup> world-eq deprived	6.03E+00	2.92E-01	3.82E+00	3.13E-01	2.07E-01	0.00E+00	2.97E-02	0.00E+00

ProplexRE FR 3mm	RESOURCE USE	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	3.21E-01	4.22E-03	1.55E-01	1.25E-02	2.86E-03	0.00E+00	1.33E-03	0.00E+00
	PERM	MJ	1.32E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	4.54E-01	4.22E-03	1.55E-01	1.25E-02	2.86E-03	0.00E+00	1.33E-03	0.00E+00
	PENRE	MJ	-2.41E+00	2.65E-01	2.76E+00	1.65E-01	1.36E-01	0.00E+00	7.39E-02	0.00E+00
	PENRM	MJ	1.52E+01	0.00E+00	1.89E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	1.28E+01	2.65E-01	4.65E+00	1.65E-01	1.36E-01	0.00E+00	7.39E-02	0.00E+00
	SM	kg	2.33E-01	1.20E-04	9.02E-04	6.22E-05	8.32E-05	0.00E+00	8.89E-05	0.00E+00
	RSF	MJ	8.89E-03	1.50E-04	3.92E-03	2.00E-04	1.04E-04	0.00E+00	2.57E-05	0.00E+00
	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	FW	m <sup>3</sup>	3.41E-03	2.14E-05	1.86E-03	3.82E-03	1.41E-05	0.00E+00	5.21E-05	0.00E+00

ProplexRE FR 3mm	WASTES	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	2.49E-02	3.00E-04	1.32E-02	2.29E-02	1.96E-04	0.00E+00	3.05E-03	0.00E+00
	NHWD	kg	5.00E-01	1.80E-02	3.17E-01	8.62E-02	8.33E-03	0.00E+00	2.84E-01	0.00E+00
	TRWD	kg	3.10E-05	1.79E-06	5.33E-06	7.10E-07	8.92E-07	0.00E+00	2.50E-07	0.00E+00
	OUTPUT FLOWS	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
	CFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	MFR	kg	1.31E-03	9.97E-05	6.22E-04	4.79E-05	6.70E-05	0.00E+00	8.67E-05	0.00E+00
	MER	kg	9.09E-05	0.00E+00	4.09E-05	2.13E-06	1.16E-06	0.00E+00	2.90E-07	0.00E+00
	EE	MJ	0.00E+00	0.00E+00	1.42E-02	0.00E+00	0.00E+00	0.00E+00	1.42E+00	0.00E+00

## ProplexRE FR 4mm

Environmental indicator results for all declared modules are shown in the following tables for the declared unit of 1m<sup>2</sup> of **ProplexRE FR 4mm**; the A1 - A3 modules are shown on an aggregated basis.

ProplexRE FR 4mm	ENVIRONMENTAL IMPACTS	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
	GWP-fossil	kg CO <sub>2</sub> eq	9.86E-01	3.48E-02	2.12E-01	9.00E-02	1.80E-02	0.00E+00	8.68E-01	0.00E+00
	GWP-biogenic	kg CO <sub>2</sub> eq	-1.07E-02	0.00E+00	1.83E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	GWP-luluc	kg CO <sub>2</sub> eq	7.40E-04	1.43E-05	1.70E-04	9.66E-06	1.01E-05	0.00E+00	2.95E-06	0.00E+00
	GWP-total	kg CO <sub>2</sub> eq	9.76E-01	3.48E-02	2.30E-01	9.00E-02	1.80E-02	0.00E+00	8.68E-01	0.00E+00
	GWP-GHG	kg CO <sub>2</sub> eq	9.87E-01	3.48E-02	2.12E-01	9.00E-02	1.80E-02	0.00E+00	8.68E-01	0.00E+00
	AP	mol H <sup>+</sup> eq	4.63E-03	8.21E-05	9.32E-04	6.31E-05	4.49E-05	0.00E+00	1.19E-04	0.00E+00
	EP-freshwater	kg PO <sub>4</sub> <sup>3-</sup> eq	2.22E-05	2.89E-06	6.26E-05	4.12E-06	1.90E-06	0.00E+00	1.41E-06	0.00E+00
	EP-marine	kg N eq	9.30E-04	1.13E-05	1.71E-04	2.81E-05	6.22E-06	0.00E+00	1.42E-04	0.00E+00
	EP-terrestrial	mol N eq	9.78E-03	1.20E-04	1.85E-03	1.60E-04	6.52E-05	0.00E+00	5.88E-04	0.00E+00
	POCP	kg NMVOC eq	3.13E-03	5.84E-05	5.52E-04	4.29E-05	3.02E-05	0.00E+00	1.47E-04	0.00E+00
	ODP	kg CFC-11 eq	9.48E-08	7.79E-09	8.35E-08	3.00E-09	3.85E-09	0.00E+00	1.51E-09	0.00E+00
	ADPMM	kg Sb eq	1.34E-05	1.15E-06	4.46E-06	5.05E-07	8.84E-07	0.00E+00	1.58E-07	0.00E+00
	ADPFF	MJ, ncv	2.27E+01	5.17E-01	4.40E+00	1.55E-01	2.64E-01	0.00E+00	1.45E-01	0.00E+00
	WDP	m <sup>3</sup> world-eq deprived	1.18E+01	5.84E-01	3.82E+00	3.13E-01	4.14E-01	0.00E+00	5.93E-02	0.00E+00

ProplexRE FR 4mm	RESOURCE USE	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	5.56E-01	8.43E-03	1.55E-01	1.25E-02	5.71E-03	0.00E+00	2.66E-03	0.00E+00
	PERM	MJ	1.32E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	6.88E-01	8.43E-03	1.55E-01	1.25E-02	5.71E-03	0.00E+00	2.66E-03	0.00E+00
	PENRE	MJ	-4.94E+00	5.29E-01	2.76E+00	1.65E-01	2.72E-01	0.00E+00	1.48E-01	0.00E+00
	PENRM	MJ	3.04E+01	0.00E+00	1.89E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	2.55E+01	5.29E-01	4.65E+00	1.65E-01	2.72E-01	0.00E+00	1.48E-01	0.00E+00
	SM	kg	4.67E-01	2.40E-04	9.03E-04	6.22E-05	1.66E-04	0.00E+00	1.78E-04	0.00E+00
	RSF	MJ	1.66E-02	3.00E-04	3.92E-03	2.00E-04	2.07E-04	0.00E+00	5.15E-05	0.00E+00
	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	FW	m <sup>3</sup>	6.75E-03	4.27E-05	1.86E-03	3.82E-03	2.82E-05	0.00E+00	1.04E-04	0.00E+00

ProplexRE FR 4mm	WASTES	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	4.57E-02	5.90E-04	1.32E-02	2.29E-02	3.92E-04	0.00E+00	6.10E-03	0.00E+00
	NHWD	kg	9.93E-01	3.60E-02	3.20E-01	8.62E-02	1.67E-02	0.00E+00	5.69E-01	0.00E+00
	TRWD	kg	6.18E-05	3.57E-06	5.34E-06	7.10E-07	1.78E-06	0.00E+00	5.01E-07	0.00E+00
	OUTPUT FLOWS	Unit	A1 - A3	A4	A5	C1	C2	C3	C4	D
	CFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	MFR	kg	2.51E-03	2.00E-04	6.23E-04	4.79E-05	1.34E-04	0.00E+00	1.73E-04	0.00E+00
	MER	kg	1.70E-04	0.00E+00	4.09E-05	2.13E-06	2.31E-06	0.00E+00	5.79E-07	0.00E+00
	EE	MJ	0.00E+00	0.00E+00	2.84E-02	0.00E+00	0.00E+00	0.00E+00	2.84E+00	0.00E+00

## References

**ecoinvent database (v3.6)** - [www.ecoinvent.ch](http://www.ecoinvent.ch)

**EN 15804:2012 + A2:2019** - Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products

**General Program Instructions, Version 3.01, 2019-09-18** - The International EPD® System - EPD International AB

**ISO 14001:2015** - Environmental management systems – Requirements with guidance for use

**ISO 14025:2009-11** - Environmental labels and declarations - Type III environmental declarations - Principles and procedures

**PCR 2019:14 - Construction products, version 1.1, 2020-09-14** - The International EPD® System - EPD International AB

**Proplex Temporary Building Protection Materials LCA (2020)** - Report for PROTEC International Ltd - EuGeos Limited

## Glossary

The International EPD® System: a programme for Type III environmental declarations, maintaining a system to verify and register EPDs as well as keeping a library of EPDs and PCRs in accordance with ISO 14025. ([www.environdec.com](http://www.environdec.com))

Life cycle assessment (LCA): LCA studies the environmental aspects and quantifies the potential impacts (positive or negative) of a product (or service) throughout its entire life. ISO standards ISO 14040 and ISO 14044 set out conventions for conducting LCA.

REACH Regulation: REACH is the European Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals. It entered into force in 2007, replacing the former legislative framework for chemicals in the EU.

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