PLASTIGLAS

ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

Chemcast® Ecogreen® from

Plastiglas de México S.A. de C.V.

Programme:	**Programme operator:**	**EPD registration:**	**Issue date:**
The International EPD® System, www.environdec.com	EPD International AB	S-P-02009	2022-08-31 Validity date: 2027-08-30

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore, continued registration and publication at www.environdec.com

LATIN AMERICA EPD®

THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM EPD VERIFIED

ENVIRONMENTAL PRODUCT DECLARATION

Content

LATIN AMERICA EPD®

1. Plastiglas de México, S.A. de C.V

Figure 1. Recycled methyl methacrylate monomer process.

Plastiglas de México S.A de C.V. was founded in 1959 as a manufacturer of acrylic sheets. In 2006, it was acquired by the Unigel Group, one of the most important petrochemical groups in Latin America. Plastiglas, specialized in acrylic cell cast, has two plants in Mexico where a wide range of products are manufactured: general purpose, sanitary grade, high impact grade and NSF grade, acrylic solid surface and recently Chemcast® Ecogreen®, 100% recycled and recyclable sheet.

One of our main objectives is to minimize the environmental footprint of its products. We have clean industry certification and a quality management system based on the ISO-9001:2015 standard that moves them to continuous improvement and environmental performance in their operations and value chain.

Figure 2. Acrylic post-consume scrap from customers.

Chemcast® Ecogreen® is our trademark of environmentally friendly cast acrylic sheet produced 100% with recycled methyl methacrylate monomer (R-MMA).

Nowadays our responsibility with the planet is create a sustainable future, a major goal for all of us, and for all members in our green supply chain.

Our process technology and innovative teams provide an effective high-tech reversible process for the recovery of recycled methyl methacrylate monomer (R-MMA) from pre and post-consumer acrylic waste from solid waste, adding value to the planet, customers, manufacturers, and distributors.

Chemcast® Ecogreen® production starts by collecting the acrylic scraps from our processing and from post-consumer waste, in this moment the new acrylic polymer redemption becomes. The recycled MMA is obtained by the de-polymerization process that recovers from PMMA, the original liquid monomer.

Plastiglas de México S.A. de C.V, Ocoyoacac, plant for more than 50 years has economically rewarded its fabricators and customers who collect and return acrylic of their own and include other manufacturers wastes.

Chemcast® Ecogreen® launches the mission of converting acrylic waste into new high-performance acrylic sheets, adding environmental value and new and creative possibilities to our consumers, creating a sustainable future.

This Environmental Product Declaration (EPD) is in accordance with ISO 14025. The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPD of construction products may not be comparable if they do not comply with EN 15804 Sustainability of Construction Works – Environmental Product Declarations – Core rules for Central Product Classification: UN CPC 369 Other plastics products; environmental product declarations within the same product category but from different programs may not be comparable.

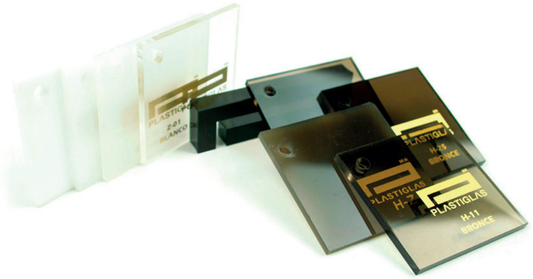

Figure 3. Chemcast® Ecogreen® (HSS)

2. General Information

PRODUCT	CAST ACRYLIC SHEET
Declaration owner	Plastiglas de México, S.A. de C.V. Av. Acueducto del Alto Lerma #8, zona industrial, Ocoyoacac Estado de México, México CP 52740 Contact person: Raúl Zepeda Sanabria raul.zepeda@plastiglas.com.mx Contact: +52 722 279 68 00
Description of the construction product	High quality, performance cast acrylic sheet produced from 100% recycled methyl methacrylate monomer material.
Declared Unit	1 metric ton of Chemcast® Ecogreen® manufactured from recycled methyl methacrylate monomer (R-MMA) in 2021 by Plastiglas de México S.A. de C.V. at Ocoyoacac plant, located in State of, Mexico.
Main product components	Recycled methyl methacrylate monomer.
Life cycle stages not considered	Upstream (A1), Core process (A2, A3), Downstream (C1, C2, C3, C4), other environmental information (D).
Content of the declaration	This EPD is based on information modules that do not cover the aspects of use and of the product. It contains in detail, for Upstream processes and Core processes (Module A1, A2 and A3), end of life (C1, C2, C3, C4+ D) and: • Product definition and physical data. • Information about raw materials and origin. • Specifications on manufacturing the product. • LCA based on a declared unit, cradle-to-gate. • LCA results. • Evidence and verifications.
For more information consult	https://www.plastiglas.com.mx
Site for which this EPD is representative	**Plastiglas de México S.A. de C.V. manufacture** plant **Ocoyoacac** Acueducto Santiago-Ocoyoacac s/n, Parque Industrial, Ocoyoacac. Estado de México CP 52740, México
Intended Public	B2B (Business to Business)

2. Product Description

2.1 Chemcast® Ecogreen®

Chemcast® Ecogreen® is product of Eco-design and environmental performance. The result is an acrylic sheet made from 100% recycled raw materials (recycled methyl methacrylate monomer) and can be reversible repeatedly.

Chemcast® Ecogreen® can be used in various applications and market segments, for interior and exterior use, mainly in advertising displays, signage, screens, skylights, domes, advertising signs, among others.

Chemcast® Ecogreen® Polymer sheets are premium quality, and high-end performance for branded cell cast acrylic sheets and completely manufactured in México.

Chemcast® Ecogreen® has the same mechanical and physical properties as cell cast acrylic sheets produced with synthetic monomer (MMA).

Chemcast® Ecogreen® manufacturing uses less water and generates less CO2 than cell cast acrylic sheets produced with synthetic monomer (MMA), which significantly reduces up to 80% the energy used to produce RMMA as a reduction in carbon footprint.

Figure 4. Chemcast® Ecogreen® product application

Product Description

Product range

Measures: manufactured in 244x122, 305x203 centimeters and additional sizes on request.

Thicknesses: from 1.5 to 50 millimeters.

Colors: Crystal, 7328, 2447, 7508, black, P95 and DP95.

This study has been done considering crystal color, but the results are applied to any of the mentioned one. The values for the physical, chemical, and mechanical properties of the product, as well as the reference standards associated with each property (Table 1).

Product Information

Chemcast® Ecogreen® looks, performs, fabricates, and lasts if standard virgin synthetic acrylics. Normally, all kinds of machining, such as CNC router and laser cutting, hot bending, solvent and polymerizable bonding, thermoforming, polishing, and digital flatbed printing can be done without any problem.

Figure 5. Chemcast® Ecogreen®

PROPERTY	UNIT	TYPICAL VALUE	METHOD
OPTICIANS			
Light transmission			
3.0 a 4.5 mm	%	92	ASTM D 1003
5.6 a 9.0 mm	%	89	
Haze	%	< 1.0	ASTM D 542
PHYSICAL- MECHANICS			
Specific weight	gr/cm^3	1.19	ASTM D 792
Tensile strength	psi	10,500	ASTM D 638
Elongation at break	%	5	ASTM D 638
Modulus of elasticity	psi	384,000	ASTM D 798
Izod impact resistance	ft lb/pulg	0.40 – 0.50	ASTM D 256
Rockwell hardness	Rockwell (escala M)	M 90 -95	ASTM D 785
Shrinkage	%	1	ASTM D 4802
THERMAL			
Maximum service temperature	°C	80	NA
Deflection temperature under load at 264 psi	°C	93	ASTM D 648
Forming temperature	°C	175 – 180	Plastiglas
PERFORMANCE			
Flammability	-	HB	UL 94
Moisture absorption (24 h)	%	0.30	ASTM D 570
Weather guarantee	years	8 (Clear)	ASTM D 2565 / Plastic
Transformation	NA	NA	Check the recomendation manual.

(*) All values refer to the Chemcast Ecogreen 3.0 mm product. These values are typical and informative for reference and do not represent a specification.

Any specific requirements must be agreed in advance.

Table 1. Physical, chemical, and mechanical properties of Ecogreen

3. Content declaration

Chemcast® Ecogreen®, acrylic sheet from recycled methyl methacrylate monomer (R-MMA) content declaration of materials and components (Table 2).

Product components	Weight (kg)	Pre and post-consumed material (%)	Renovable material (%)
MMA Regenerado	9.90E+02	100.00%	0.00%
Others	9.60E+00	0.00%	0.00%
Packaging material	**Weight (kg)**	**Weight in relation with final product (%)**	
Wooden platform	2.50E+01	2.41%	
Paperboard	1.20E+01	1.16%	
Strip	5.00E-01	0.05%	
Staples	3.97E-03	0.00%	

Table 2. Chemcast® Ecogreen® content declaration of materials and components.

Content declaration of the environmental and hazardous properties of substances contained in Chemcast® Ecogreen® according to the European Chemicals Agency (Table 3).

Material or Chemical Substances	Weight (%)	CAS Number	Function of Chemical Substance	Health class[1]
Recycled methyl methacrylate monomer	99.04 %	80-62-6	Main material	Not listed
Others	.96 %	NA	Additives	Not listed

1 According to EN15804 declaration of material content of the product shall List of Substances of Very High Concern (SVHC) that are listed by European Chemicals Agency.

Table 3. Chemcast® Ecogreen® content declaration of environmental and hazardous

Information on biogenic carbon content per one metric ton of Chemcast® Ecogreen® (Table 4)

Biogenic carbon content	Unit	Quantity
Biogenic carbon content in product	Kg C	0.00E+00
Biogenic carbon content in packaging	Kg C	4.87E+00

Table 4. Biogenic carbon content of Chemcast® Ecogreen® product and package

4. LCA Rules

Environmental potential impacts were calculated according to EN 15804:2012 and PCR 2019:14 V 1.11 Construction products. This EPD is in accordance with ISO 14025:2006.

Environmental potential impacts were calculated through Life Cycle Assessment (LCA) methodology according to ISO 14040:2006 and ISO 14044:2006. An external third-party veri-fication process of the EPD was conducted according to the General Program Instructions for the International EPD® System Version 4.0.

System Version 3.0. Verifi¬cation includes a documental review and a validation of both the underlying LCA study and documents describing additional environmental information that justify data provided in the EPD.

4.1 Declared unit

1000 kilograms of Chemcast® Ecogreen® manufactured from recycled methyl methacrylate monomer (R-MMA) in 2021 by Plastiglas de México S.A. de C.V. at Ocoyoacac plant, located in Mexico.

4.2 System boundary

The potential environmental impacts were calculated through Life Cycle Assessment (LCA) methodology through ISO 14040:2006 and ISO 14044:2006. The boundary system of this study cover Cradle to Gate with modules C1-C4 and module D (A1-A3 + C + D). Table 5 presented the modules declared, geography, share of specific data (in GWP-GHG indicator) and data variation.

	Product stage			Construction procees stage		Use stage						End of life stage				Resource recovery stage
	Raw material suplly	Transport	Manufacturing	Transport	Construction instalation	Use	Maintenance	Repair	Refurbishment	Operational energy use	Operational water use	De-construction demolision	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-pontential
Module	A1	A2	A3	A4	A5	B1	B2	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU	EU	MX	ND	ND	ND	ND	ND	ND	ND	ND	EU	EU	EU	EU	EU
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-
Variation-products	NA			-	-	-	-	-	-	-	-	-	-	-	-	-
Variation-sites	NA			-	-	-	-	-	-	-	-	-	-	-	-	-

X = Module declared; ND = Module not declared

Table 5. Chemcast® Ecogreen® System boundary

LCA Rules

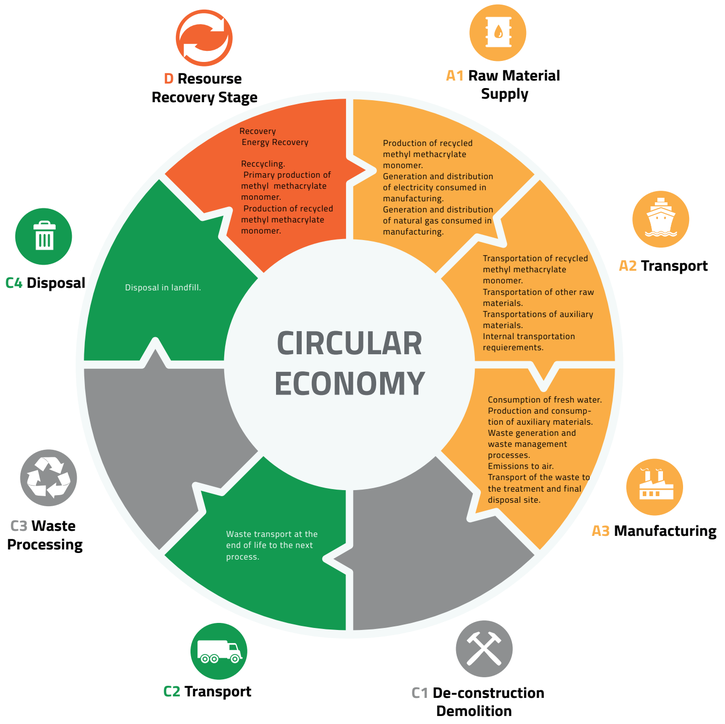

Figure 5. Description modules information included in this EPD

4.3 Description of scenarios for end of life

Chemcast® Ecogreen® has various applications. In 2021 more than 90% of the product was used in the manufacture of displays. The useful lifetime was estimated at 1.5 years for this product and possible end-of-life scenarios proposed were: recycling, energy recovery and final disposal in a sanitary landfill. For the demolition stage only labor is required.

The possible economic and technically viable scenario expected at the end of life is 70% for recycling (70% to New Delhi, India and 30% to the State of Mexico, Mexico), 20% destined to energy assessment in a landfill with 74% efficiency and 10% is send to the landfill. This proportion was applied to one metric ton of Ecogreen at the end of its useful life.

Additionally, an analysis was carried out for the recycling, energy recovery and final disposal scenarios based on the functional unit, for consideration in Ecodesign projects.

The parameters for the end-of-life stage of Chemcast® Ecogreen® are presented in Table 6.

For module D, net benefits and loads from net flows leaving the product system that have passed the end-of-waste, were considered recycling and energy recover.

Parameter	Unit/ ton of Chemcast® Ecogreen®
Collection process	700 kg collected separately for recycling
	200 kg collected separately for energy evaluation
	100 kg collected with mixed construction waste
Recovery system, specified by type	700 kg for recycling
	200 kg for energy recovery
Elimination, specified by type	100 kg Ecogreen for final disposal in landfill or final disposal site
Assumptions for the development of scenarios.	All land transport used have a load capacity greater than 32 tons.
	The sanitary landfill with energy assessment has a utilization efficiency of 74%.
	70% of the material recovered for recycling is sent to methyl methacrylate recycling plants in New Delhi, India and State of Mexico, Mexico in proportions of 70% and 30%, respectively.
	The recycling process for methyl methacrylate is the same in the plants located in India and Mexico.

Table 6. Chemcast® Ecogreen® parameters for the end-of-life stage.

LCA Rules

For recycling, the life cycle inventory of the regenerated methyl methacrylate (R-MMA) processing of the Plastiglas de México S.A. of C.V. plant itself was used to represent the process of both countries (India and México) and was compared against the production of methyl methacrylate of primary origin produced by a subsidiary of Plastiglas de México S.A. of C.V., using the corresponding life cycle inventory.

In the case of the 20% that is used as secondary fuel a Ecoinvent 3.8 data set was used with a 74% energy recovery. The net charges and benefits as secondary fuel were modeled up to the point of functional equivalence at which the primary fuel is substituted. For this case, a heat generation plant from natural gas was considered from Ecoinvent 3.8 database.

4.4 Description of the manufacturing process

The Chemcast® Ecogreen® manufacturing process is described in Figure 6:

4.5 Assumptions

The following are the assumptions related to the industrialization process fabrication of Chemcast® Ecogreen®:

1. Ten percent of the electricity is used in the administrative and service areas.

2. The diesel and naptha used for internal transport come from Tula, Hidalgo, México.

3. The raw materials packages are manufactured in the same place of origin as these.

4. For the end-of-life recycling scenario 70% is sent to New Delhi, India and 30% to Plastiglas de México S.A. plant. de C.V. in Mexico.

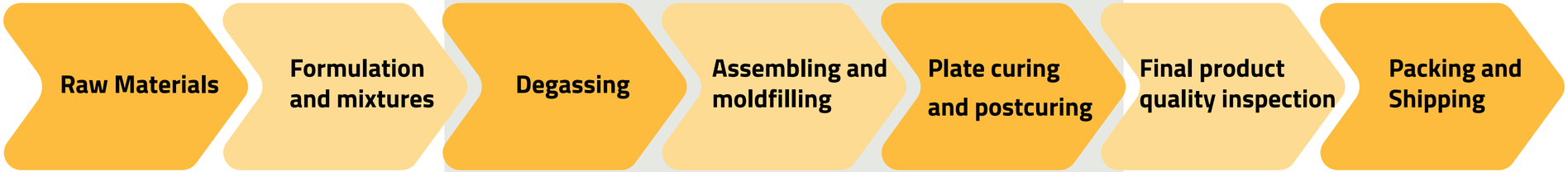

Figure 6. Flow diagram of Chemcast® Ecogreen®

4.6 Cut-off criteria

All flows of fuel, energy, materials and supplies necessary to produce Chemcast® Ecogreen® have been considered. Materials that could use in preventive or corrective maintenance of machinery and equipment were disregarded as well as the use of uniforms, personal protective equipment. The waste generated by these disaggregated inputs was also not included.

4.7 Allocation

There are not coproducts for Chemcast® Ecogreen®.

4.8 Time representativeness

Direct data obtained from Plastiglas de México S.A. de C.V. is representative for 2021.

4.9 Data quality assessment

Data quality assessment per information module is provided in Tables 7, 8 and 9.

LCA Rules

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Data	Geographic Representative	Technical Representative	Temporal Representative
Consumption of raw materials for the manufacture of Chemcast® Ecogreen®	Good	Good	Good
Consumption of scrap and process for the manufacture of recycled methyl methacrylate monomer (R-MMA)	Good	Good	Good
Consumption of raw material packaging materials	Good	Good	Good
Consumption of raw materials for the manufacture of packaging	Good	Good	Good
Consumption of energy, emissions, waste, and materials for the manufacture of raw materials	Good	Good	Good
Consumption of fuels and emissions related to electricity production in Mexico at country level	Good	Good	Good
Energy and materials consumption and emissions related to diesel production in Mexico	Good	Medium	Good

ⓘ Table 7. Raw material supply upstream processes data quality assessment.

Data	Geographic Representative	Technical Representative	Temporal Representative
Internal transport and fuel consumption	Very good	Good	Good
Raw material transportation distance	Very good	Good	Good
Transport distance of packaging materials from raw materials and supplies	Very good	Good	Good
Distance of transportation of packaging materials from the finished product	Very good	Good	Good
Distance of transportation of finished product	Very good	Good	Good
Distance of transportation of waste	Very good	Good	Good
Consumption of materials and energy, emissions related to the transport requirements of raw materials and inputs for the manufacture and packaging of the finished product.	Medium	Good	Good

ⓘ Table 8. Core processes data quality assessment.

Data	**Geographic Representative**	**Technical Representative**	**Temporal Representative**
Distance of transportation of waste for landfill, recycling, and energy recovery.	Medium	Medium	Medium
Waste disposal	Medium	Medium	Medium
Production of the manufacture of recycled methyl methacrylate monomer (R-MMA)	Very good	Very good	Very good
Production of the manufacture of methyl methacrylate monomer by primary origin.	Very good	Very good	Good
Energy recovery	Medium	Good	Good
Energy avoidance load	Medium	Good	Good

ⓘ Table 9. End of life scenarios data quality assessment.

5. Environmental performance

The impact categories mandatory and additional were calculated under the EN 15804:2012 and PCR 2019:14 V 1.11 Construction products.

Method V1.02 / EF 3.0 normalization and weighting set (PRé-Sustainability, 2021) implemented in the SimaPro 9.3.0.3 software. The results are presented in section 8.

6. Use of resources, waste production and output flows

Parameters describing resource use were evaluated for all stages included with the Cumulated Energy Demand method version 1.09 (Frischknecht et al. 2007) except for the indicator of use of net fresh water that was evaluated with Recipe 2016 Midpoint (H) version 1.00 (Huijbregts et al. 2017). The parameters of waste production were evaluated with EDIP 2003 V1.07/Default.

Additionally, the simulation of each proposed end-of-life scenario (disposal in landfill, recycling and energy recovery) for the functional unit is presented.

6.1 Use of resources, waste production and output flows/ Product process

The detailed description of the use of resources, waste production and output flows for product process (A1 to A3) are provided in Table 10, 11 and 12, respectively.

Parameter	Unit	Total	A1) Raw materials supply	A2) Transportation	A3) Manufacturing
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	1.88E+03	2.63E+03	2.54E+00	7.03E+02
Use of renewable primary energy as raw materials	MJ	9.12E+02	9.12E+02	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ	1.88E+03	1.17E+03	2.54E+00	7.03E+02
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	1.39E+04	6.27E+03	4.34E+02	3.09E+02
Use of non-renewable primary energy used as raw materials	MJ	6.86E+03	6.86E+03	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ	1.39E+04	1.31E+04	4.34E+02	3.09E+02
Use of secondary material	kg	1.01E+03	1.01E+03	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	1.63E+01	9.37E+00	2.35E-02	6.93E+00

Table 10. Resource indicators per metric ton of Chemcast® Ecogreen® for A1 to A3.

Parameter	Unit	Total	A1) Raw materials supply	A2) Transportation	A3) Manufacturing
Hazardous waste disposed	kg	1.41E-02	1.28E-02	8.23E-04	4.43E-04
Non-hazardous waste disposed	kg	1.07E+02	7.73E+01	6.76E+00	2.32E+01
Radioactive waste disposed*	kg	2.87E-02	2.59E-02	2.14E-03	6.68E-04

Table 11. Waste production indicators per metric ton of Chemcast® Ecogreen® for A1 to A3.

* Values from dataset in Ecoinvent 3.6 databases. The processes carried out in the Chemcast® Ecogreen® production plant do not produce radioactive waste

Parameter	Unit	Total	A1) Raw materials supply	A2) Transportation	A3) Manufacturing
Components for reuse	kg	8.38E-01	0.00E+00	0.00E+00	8.38E-01
Materials for recycling	kg	1.06E+01	0.00E+00	0.00E+00	1.06E+01
Materials for energy recovery	kg	4.67E-02	0.00E+00	0.00E+00	4.67E-02
Exported energy thermal energy	MJ	1.96E-04	0.00E+00	0.00E+00	1.96E-04

Table 12. Output Flows indicators per metric ton of Chemcast® Ecogreen® for A1 to A3.

Use of resources, waste production and output flows

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6.2 Use of resources, waste production and output flows/ end of life scenario

The detailed description of the use of resources, waste production and output flows for the end of life scenario (C1-C4+D) are provided in Table 13, 14 and 15, respectively.

Parameter	Unit	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	0.00E+00	3.00E+01	0.00E+00	1.53E+00	-1.61E+04
Use of renewable primary energy as raw materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ	0.00E+00	3.00E+01	0.00E+00	1.53E+00	-1.61E+04
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	0.00E+00	3.25E+03	0.00E+00	3.59E+01	-6.03E+04
Use of non-renewable primary energy used as raw materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ	0.00E+00	3.25E+03	0.00E+00	3.59E+01	-6.03E+04
Use of secondary material	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.00E-01
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.95E+03
Use of net fresh water	m3	0.00E+00	3.23E-01	0.00E+00	3.13E-02	-2.23E+03

Table 13. Resource indicators per metric ton of Chemcast® Ecogreen® for end-of-life scenario.

Parameter	Unit	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Hazardous waste disposed	kg	0.00E+00	6.15E-03	0.00E+00	1.13E-04	-2.69E-02
Non-hazardous waste disposed	kg	0.00E+00	1.93E-01	0.00E+00	8.19E-02	-7.73E+00
Radioactive waste disposed*	kg	0.00E+00	2.02E+02	0.00E+00	1.00E+02	-7.65E+01

** Values from dataset in Ecoinvent 3.8 databases. The processes carried out in the Chemcast® Ecogreen® production plant do not produce radioactive waste.*

Table 14. Waste production indicators per metric ton of Chemcast® Ecogreen® for end-of-life scenario.

Parameter	Unit	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Components for reuse	kg	0.00E+00	2.05E-02	0.00E+00	1.75E-04	-2.45E-02
Materials for recycling	kg	0.00E+00	1.56E-02	0.00E+00	2.28E-04	-3.42E-01
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy thermal energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 15. Output Flows indicators per metric ton of Chemcast® Ecogreen® for end-of-life scenario.

Use of resources, waste production and output flows

6.3 Use of resources, waste production and output flows/ landfill disposal

The detailed description of the use of resources, waste production and output flows for the landfill disposal scenario of end of life (C1-C4+D) are provided in Table 16, 17 and 18, respectively.

Parameter	Unit	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	0.00E+00	4.76E-01	0.00E+00	1.53E+01	0.00E+00
Use of renewable primary energy as raw materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ	0.00E+00	4.76E-01	0.00E+00	1.53E+01	0.00E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	0.00E+00	4.56E+01	0.00E+00	3.59E+02	0.00E+00
Use of non-renewable primary energy used as raw materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ	0.00E+00	4.56E+01	0.00E+00	3.59E+02	0.00E+00
Use of secondary material	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	0.00E+00	5.39E-03	0.00E+00	3.13E-01	0.00E+00

Table 16. Resource indicators per metric ton of Chemcast® Ecogreen® for landfill disposal scenario.

Parameter	Unit	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Hazardous waste disposed	kg	0.00E+00	1.06E-04	0.00E+00	1.13E-03	0.00E+00
Non-hazardous waste disposed	kg	0.00E+00	3.19E-03	0.00E+00	8.19E-01	0.00E+00
Radioactive waste disposed*	kg	0.00E+00	3.98E+00	0.00E+00	1.00E+03	0.00E+00

** Values from dataset in Ecoinvent 3.8 databases. The processes carried out in the Chemcast® Ecogreen® production plant do not produce radioactive waste.*

Table 17. Waste production indicators per metric ton of Chemcast® Ecogreen® for landfill disposal scenario.

Parameter	Unit	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy thermal energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 18. Output Flows indicators per metric ton of Chemcast® Ecogreen® for landfill disposal scenario

Use of resources, waste production and output flows

6.4 Use of resources, waste production and output flows/ recycling

The detailed description of the use of resources, waste production and output flows for the recycling scenario of end of life (C1-C4+D) are provided in Table 19, 20 and 21, respectively.

Parameter	Unit	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	0.00E+00	4.19E+01	0.00E+00	0.00E+00	-2.32E+04
Use of renewable primary energy as raw materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ	0.00E+00	4.19E+01	0.00E+00	0.00E+00	-2.32E+04
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	0.00E+00	4.55E+03	0.00E+00	0.00E+00	-8.08E+04
Use of non-renewable primary energy used as raw materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ	0.00E+00	4.55E+03	0.00E+00	0.00E+00	-8.19E+04
Use of secondary material	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E+03
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	0.00E+00	4.51E-01	0.00E+00	0.00E+00	-3.19E+03

Table 19. Resource indicators per metric ton of Chemcast® Ecogreen® for recycling scenario.

Parameter	Unit	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Hazardous waste disposed	kg	0.00E+00	8.56E-03	0.00E+00	0.00E+00	-4.10E-02
Non-hazardous waste disposed	kg	0.00E+00	2.80E+02	0.00E+00	0.00E+00	-2.32E+02
Radioactive waste disposed*	kg	0.00E+00	2.88E-02	0.00E+00	0.00E+00	-5.31E-02

** Values from dataset in Ecoinvent 3.8 databases. The processes carried out in the Chemcast® Ecogreen® production plant do not produce radioactive waste.*

Table 20. Waste production indicators per metric ton of Chemcast® Ecogreen® for recycling scenario.

Parameter	Unit	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.25E+01
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.26E+02
Exported energy thermal energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E+00

Table 21. Output Flows indicators per metric ton of Chemcast® Ecogreen® for recycling scenario.

Use of resources, waste production and output flows

6.5 Use of resources, waste production and output flows/ energy recovery

The detailed description of the use of resources, waste production and output flows for the energy recovery scenario of end of life (C1-C4+D) are provided in Table 22, 23 and 24, respectively

Parameter	Unit	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	0.00E+00	3.17E+00	0.00E+00	0.00E+00	3.66E+02
Use of renewable primary energy as raw materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ	0.00E+00	3.17E+00	0.00E+00	0.00E+00	3.66E+02
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	0.00E+00	3.04E+02	0.00E+00	0.00E+00	-1.46E+04
Use of non-renewable primary energy used as raw materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ	0.00E+00	3.04E+02	0.00E+00	0.00E+00	-1.46E+04
Use of secondary material	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m3	0.00E+00	3.59E-02	0.00E+00	0.00E+00	7.93E+00

Table 22. Resource indicators per metric ton of Chemcast® Ecogreen® for energy recovery scenario.

Parameter	Unit	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Hazardous waste disposed	kg	0.00E+00	7.04E-04	0.00E+00	0.00E+00	9.09E-03
Non-hazardous waste disposed	kg	0.00E+00	2.65E+01	0.00E+00	0.00E+00	4.31E+02
Radioactive waste disposed*	kg	0.00E+00	1.90E-03	0.00E+00	0.00E+00	6.35E-02

** Values from dataset in Ecoinvent 3.8 databases. The processes carried out in the Chemcast® Ecogreen® production plant do not produce radioactive waste.*

Table 23. Waste production indicators per metric ton of Chemcast® Ecogreen® for energy recovery scenario.

Parameter	Unit	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+03
Exported energy thermal energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.97E+04

Table 24. Output Flows indicators per metric ton of Chemcast® Ecogreen® for energy recovery scenario.

7. Potential environmental impact

All information modules are reported and valued separately. However, in the present EPD presents itself the total impact across all stage.

7.1 Environmental impact/Product process

The impact results for mandatory and additional categories for product process (A1-A3) are provided in Figures 7, 8 and Table 25 and 26, respectively.

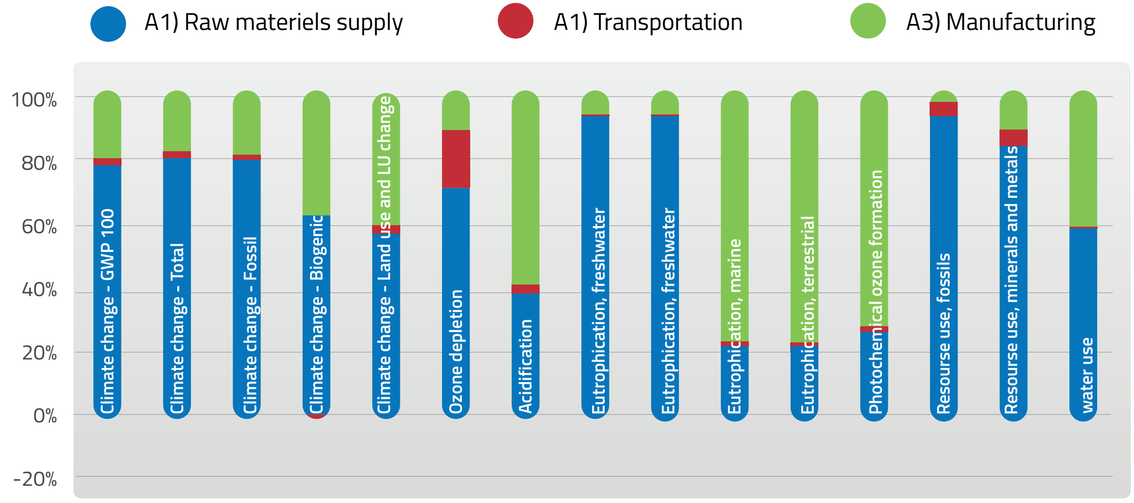

Figure 7.Environmental impact for mandatory categories per metric ton of Chemcast® Ecogreen®

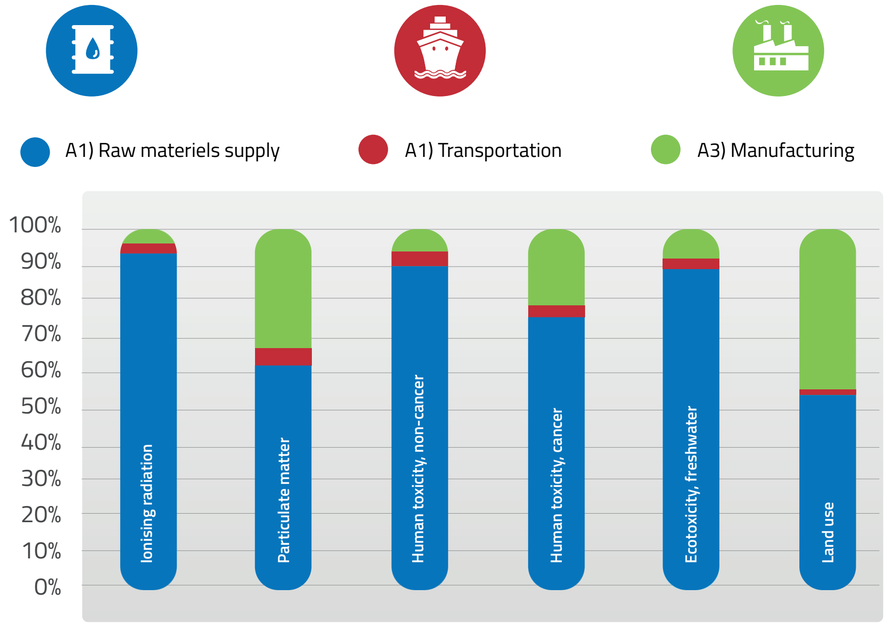

Figure 8. Environmental impact for additional categories per metric ton of Chemcast® Ecogreen®

Potential environmental impact

Category	Units	A1) Raw materials supply	A2) Transportation	A3) Manufacturing	Total
Climate change- GWP[1]	kg CO2-eq	6.72E+02	2.06E+01	1.75E+02	8.67E+02
	%	77.44%	2.37%	20.19%	100.00%
Climate change - Total	kg CO2 eq	6.49E+02	2.16E+01	1.45E+02	8.16E+02
	%	79.58%	2.65%	17.76%	100.00%
Climate change - Fossil	kg CO2 eq	6.85E+02	2.16E+01	1.65E+02	8.71E+02
	%	78.56%	2.48%	18.96%	100.00%
Climate change - Biogenic	kg CO2 eq	-3.54E+01	1.11E-02	-2.16E+01	-5.70E+01
	%	62.14%	-0.02%	37.88%	100.00%
Climate change - Land use and LU change	kg CO2 eq	1.45E-01	6.60E-03	1.01E-01	2.52E-01
	%	57.38%	2.62%	40.00%	100.00%
Ozone depletion	kg CFC11 eq	7.48E-05	1.72E-05	9.44E-06	1.02E-04
	%	73.74%	16.97%	9.30%	100.00%
Acidification	mol H+ eq	3.05E+00	9.57E-02	3.98E+00	7.12E+00
	%	42.79%	1.34%	55.87%	100.00%
Eutrophication, freshwater	kg P eq	1.58E-01	1.07E-03	6.72E-03	1.65E-01
	%	95.29%	0.65%	4.06%	100.00%
Eutrophication, freshwater	kg PO4 eq	4.84E-01	3.29E-03	2.06E-02	5.08E-01
	%	95.29%	0.65%	4.06%	100.00%
Eutrophication, marine	kg N eq	5.98E-01	2.80E-02	2.10E+00	2.73E+00
	%	21.92%	1.02%	77.06%	100.00%
Eutrophication, terrestrial	mol N eq	6.24E+00	3.06E-01	2.25E+01	2.91E+01
	%	21.47%	1.05%	77.48%	100.00%
Photochemical ozone formation	kg NMVOC eq	1.86E+00	9.10E-02	5.39E+00	7.34E+00
	%	25.39%	1.24%	73.37%	100.00%
Resource use, fossils	MJ	1.20E+04	4.05E+02	2.86E+02	1.27E+04
	%	94.57%	3.18%	2.25%	100.00%
Resource use, minerals, and metals	kg Sb eq	1.17E-03	4.78E-05	1.31E-04	1.34E-03
	%	86.67%	3.56%	9.77%	100.00%
Water use	m3 depriv.	3.34E+02	7.21E-01	2.32E+02	5.67E+02
	%	58.98%	0.13%	40.90%	100.00%

1 The indicator 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 EN 15804:2012+A1:2013.

ⓘ Table 25. Environmental impact for mandatory categories per metric ton of Chemcast® Ecogreen®

Category	Units	A1) Raw materials supply	A2) Transportation	A3) Manufacturing	Total
Ionising radiation	kBq U-235 eq	5.63E+01	1.43E+00	1.02E+00	5.88E+01
	%	95.82%	2.44%	1.74%	100.00%
Particulate matter	disease inc.	2.08E-05	9.30E-07	1.06E-05	3.23E-05
	%	64.25%	2.88%	32.87%	100.00%
Human toxicity, non-cancer	CTUh	5.13E-06	1.61E-07	3.57E-07	5.65E-06
	%	90.82%	2.86%	6.32%	100.00%
Human toxicity, cancer	CTUh	2.37E-07	6.71E-09	6.85E-08	3.12E-07
	%	75.90%	2.15%	21.95%	100.00%
Ecotoxicity, fresh-water	CTUe	8.70E+03	2.63E+02	8.30E+02	9.79E+03
	%	88.84%	2.69%	8.48%	100.00%
Land use	Pt	5.96E+03	1.11E+02	4.96E+03	1.10E+04
	%	54.04%	1.01%	44.95%	100.00%

ⓘ Table 26. Environmental impact for additional categories per metric ton of Chemcast® Ecogreen®

Potential environmental impact

7.2 Environmental impact/ end of life scenario

The impact results for mandatory and additional categories for end of life scenario (C1-C4 + D) are provided in Table 27 and 28, respectively.

Additionally, the individual evaluation of each proposed end-of-life scenario (landfill disposal, recycling and energy recovery) for the functional unit is presented.

Categories	Units	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Cambio climático- GWP100	kg CO2-eq	0.00E+00	2.09E+02	0.00E+00	6.13E+01	-2.08E+03
Cambio climático - Total	kg CO2 eq	0.00E+00	2.11E+02	0.00E+00	9.57E+01	-2.00E+03
Climate change - Fossil	kg CO2 eq	0.00E+00	2.11E+02	0.00E+00	5.98E+00	-2.16E+03
Climate change - Biogenic	kg CO2 eq	0.00E+00	9.29E-02	0.00E+00	8.40E+01	1.68E+02
Climate change - Land use and LU change	kg CO2 eq	0.00E+00	1.04E-01	0.00E+00	2.38E-03	-4.56E+00
Ozone depletion	kg CFC11 eq	0.00E+00	4.58E-05	0.00E+00	3.47E-07	-6.36E-05
Acidification	mol H+ eq	0.00E+00	3.01E+00	0.00E+00	1.77E-02	-2.98E+01
Eutrophication, freshwater	kg P eq	0.00E+00	1.25E-02	0.00E+00	1.59E-03	-2.34E-01
Eutrophication, freshwater	kg PO4 eq	0.00E+00	3.84E-02	0.00E+00	4.88E-03	-7.19E-01
Eutrophication, marine	kg N eq	0.00E+00	8.06E-01	0.00E+00	1.79E-01	-3.03E+00
Eutrophication, terrestrial	mol N eq	0.00E+00	8.91E+00	0.00E+00	4.84E-02	-3.28E+01
Photochemical ozone formation	kg NMVOC eq	0.00E+00	2.41E+00	0.00E+00	3.50E-02	-1.19E+01
Resource use, fossils	MJ	0.00E+00	3.06E+03	0.00E+00	3.38E+01	-5.54E+04
Resource use, minerals and metals	kg Sb eq	0.00E+00	4.19E-04	0.00E+00	6.99E-06	-1.34E-02
Water use	m3 depriv.	0.00E+00	9.83E+00	0.00E+00	1.19E+00	-6.98E+03

Table 27. Environmental impact for mandatory categories per metric ton of Chemcast® Ecogreen® for C1 to C4 + D end of life scenario.

Categories	Units	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Ionising radiation	kBq U-235 eq	0.00E+00	1.42E+01	0.00E+00	2.12E-01	-3.43E+01
Particulate matter	disease inc.	0.00E+00	1.87E-05	0.00E+00	2.17E-07	-1.80E-04
Human toxicity, non-cancer	CTUh	0.00E+00	2.23E-06	0.00E+00	1.53E-07	-1.69E-05
Human toxicity, cancer	CTUh	0.00E+00	8.96E-08	0.00E+00	3.31E-09	-6.41E-07
Ecotoxicity, freshwater	CTUe	0.00E+00	2.36E+03	0.00E+00	5.11E+02	-4.12E+04
Land use	Pt	0.00E+00	2.56E+03	0.00E+00	6.09E+01	-7.36E+04

Table 28. Environmental impact for additional categories per metric ton of Chemcast® Ecogreen® for C1 to C4 + D end of life scenario.

Potential environmental impact

7.3 Environmental impact/ landfill disposal

The impact results for mandatory and additional categories for landfill disposal scenario for end of life (C1-C4 + D) are provided in Table 29 and 30, respectively.

Categories	Units	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Climate change-GWP[1]	kg CO2-eq	0.00E+00	2.77E+00	0.00E+00	6.13E+02	0.00E+00
Climate change - Total	kg CO2 eq	0.00E+00	2.79E+00	0.00E+00	9.57E+02	0.00E+00
Climate change - Fossil	kg CO2 eq	0.00E+00	2.79E+00	0.00E+00	5.98E+01	0.00E+00
Climate change - Biogenic	kg CO2 eq	0.00E+00	2.02E-03	0.00E+00	8.40E+02	0.00E+00
Climate change - Land use and LU change	kg CO2 eq	0.00E+00	1.05E-03	0.00E+00	2.38E-02	0.00E+00
Ozone depletion	kg CFC11 eq	0.00E+00	6.34E-07	0.00E+00	3.47E-06	0.00E+00
Acidification	mol H+ eq	0.00E+00	1.42E-02	0.00E+00	1.77E-01	0.00E+00
Eutrophication, freshwater	kg P eq	0.00E+00	2.03E-04	0.00E+00	1.59E-02	0.00E+00
Eutrophication, freshwater	kg PO4 eq	0.00E+00	6.24E-04	0.00E+00	4.88E-02	0.00E+00
Eutrophication, marine	kg N eq	0.00E+00	4.81E-03	0.00E+00	1.79E+00	0.00E+00
Eutrophication, terrestrial	mol N eq	0.00E+00	5.26E-02	0.00E+00	4.84E-01	0.00E+00
Photochemical ozone formation	kg NMVOC eq	0.00E+00	1.57E-02	0.00E+00	3.50E-01	0.00E+00
Resource use, fossils	MJ	0.00E+00	4.30E+01	0.00E+00	3.38E+02	0.00E+00
Resource use, minerals, and metals	kg Sb eq	0.00E+00	6.41E-06	0.00E+00	6.99E-05	0.00E+00
Water use	m3 depriv.	0.00E+00	1.65E-01	0.00E+00	1.19E+01	0.00E+00

1 The indicator 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 definedin EN 15804:2012+A1:2013.

ⓘ Table 29. Environmental impact for mandatory categories per metric ton of Chemcast® Ecogreen® for C1 to C4 + D landfill disposal scenario

Categories	Units	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Ionising radiation	kBq U-235 eq	0.00E+00	2.02E-01	0.00E+00	2.12E+00	0.00E+00
Particulate matter	disease inc.	0.00E+00	3.29E-07	0.00E+00	2.17E-06	0.00E+00
Human toxicity, non-cancer	CTUh	0.00E+00	3.72E-08	0.00E+00	1.53E-06	0.00E+00
Human toxicity, cancer	CTUh	0.00E+00	9.37E-10	0.00E+00	3.31E-08	0.00E+00
Ecotoxicity, freshwater	CTUe	0.00E+00	3.60E+01	0.00E+00	5.11E+03	0.00E+00
Land use	Pt	0.00E+00	4.86E+01	0.00E+00	6.09E+02	0.00E+00

ⓘ Table 30. Environmental impact for additional categories per metric ton of Chemcast® Ecogreen® for C1 to C4 + D landfill disposal scenario

Potential environmental impact

7.4 Environmental impact/ recycling

The impact results for mandatory and additional categories for recycling scenario for end of life (C1-C4 + D) are provided in Table 31 and 32, respectively.

Categories	Units	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Climate change- GWP[1]	kg CO2-eq	0.00E+00	2.93E+02	0.00E+00	0.00E+00	-3.23E+03
Climate change - Total	kg CO2 eq	0.00E+00	2.95E+02	0.00E+00	0.00E+00	-3.11E+03
Climate change - Fossil	kg CO2 eq	0.00E+00	2.95E+02	0.00E+00	0.00E+00	-3.34E+03
Climate change - Biogenic	kg CO2 eq	0.00E+00	1.29E-01	0.00E+00	0.00E+00	2.39E+02
Climate change - Land use and LU change	kg CO2 eq	0.00E+00	1.47E-01	0.00E+00	0.00E+00	-6.62E+00
Ozone depletion	kg CFC11 eq	0.00E+00	6.42E-05	0.00E+00	0.00E+00	-1.04E-04
Acidification	mol H+ eq	0.00E+00	4.27E+00	0.00E+00	0.00E+00	-4.31E+01
Eutrophication, freshwater	kg P eq	0.00E+00	1.75E-02	0.00E+00	0.00E+00	-5.20E-01
Eutrophication, freshwater	kg PO4 eq	0.00E+00	5.36E-02	0.00E+00	0.00E+00	-1.60E+00
Eutrophication, marine	kg N eq	0.00E+00	1.14E+00	0.00E+00	0.00E+00	-4.46E+00
Eutrophication, terrestrial	mol N eq	0.00E+00	1.26E+01	0.00E+00	0.00E+00	-4.81E+01
Photochemical ozone formation	kg NMVOC eq	0.00E+00	3.41E+00	0.00E+00	0.00E+00	-1.72E+01
Resource use, fossils	MJ	0.00E+00	4.29E+03	0.00E+00	0.00E+00	-7.54E+04
Resource use, minerals and metals	kg Sb eq	0.00E+00	5.85E-04	0.00E+00	0.00E+00	-2.00E-02
Water use	m3 depriv.	0.00E+00	1.37E+01	0.00E+00	0.00E+00	-1.01E+04

1 The indicator 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 EN 15804:2012+A1:2013.

ⓘ Table 31. Environmental impact for mandatory categories per metric ton of Chemcast® Ecogreen® for C1 to C4 + D recycling scenario

Categories	Units	C1) Deconstruction demolition	C2) Transport	C3) Waste processing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Ionising radiation	kBq U-235 eq	0.00E+00	1.99E+01	0.00E+00	0.00E+00	-6.73E+01
Particulate matter	disease inc.	0.00E+00	2.61E-05	0.00E+00	0.00E+00	-2.66E-04
Human toxicity, non-cancer	CTUh	0.00E+00	3.10E-06	0.00E+00	0.00E+00	-2.84E-05
Human toxicity, cancer	CTUh	0.00E+00	1.26E-07	0.00E+00	0.00E+00	-1.29E-06
Ecotoxicity, freshwater	CTUe	0.00E+00	3.30E+03	0.00E+00	0.00E+00	-7.16E+04
Land use	Pt	0.00E+00	3.56E+03	0.00E+00	0.00E+00	-1.06E+05

ⓘ Table 32.Environmental impact for additional categories per metric ton of Chemcast® Ecogreen® for C1 to C4 + D recycling scenario

Potential environmental impact

LATIN AMERICA EPD®

7.5 Environmental impact/ energy recovery

The impact results for mandatory and additional categories for energy recovery scenario for end of life (C1-C4 + D) are provided in Table 33 and 34, respectively.

Categories	Units	C1) Deconstruction demolition	C2) Transport	C3) Waste process-ing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Climate change – GWP[1]	kg CO2-eq	0.00E+00	1.84E+01	0.00E+00	0.00E+00	9.11E+02
Climate change - Total	kg CO2 eq	0.00E+00	1.86E+01	0.00E+00	0.00E+00	8.82E+02
Climate change - Fossil	kg CO2 eq	0.00E+00	1.86E+01	0.00E+00	0.00E+00	8.79E+02
Climate change - Biogenic	kg CO2 eq	0.00E+00	1.35E-02	0.00E+00	0.00E+00	2.92E+00
Climate change - Land use and LU change	kg CO2 eq	0.00E+00	6.99E-03	0.00E+00	0.00E+00	3.48E-01
Ozone depletion	kg CFC11 eq	0.00E+00	4.22E-06	0.00E+00	0.00E+00	4.52E-05
Acidification	mol H+ eq	0.00E+00	9.47E-02	0.00E+00	0.00E+00	2.20E+00
Eutrophication, freshwater	kg P eq	0.00E+00	1.35E-03	0.00E+00	0.00E+00	6.50E-01
Eutrophication, freshwater	kg PO4 eq	0.00E+00	4.16E-03	0.00E+00	0.00E+00	2.00E+00
Eutrophication, marine	kg N eq	0.00E+00	3.21E-02	0.00E+00	0.00E+00	4.63E-01
Eutrophication, terrestrial	mol N eq	0.00E+00	3.51E-01	0.00E+00	0.00E+00	4.24E+00
Photochemical ozone for-mation	kg NMVOC eq	0.00E+00	1.05E-01	0.00E+00	0.00E+00	7.16E-01
Resource use, fossils	MJ	0.00E+00	2.87E+02	0.00E+00	0.00E+00	-1.27E+04
Resource use, minerals, and metals	kg Sb eq	0.00E+00	4.28E-05	0.00E+00	0.00E+00	2.94E-03
Water use	m3 depriv.	0.00E+00	1.10E+00	0.00E+00	0.00E+00	3.13E+02

1 The indicator 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 EN 15804:2012+A1:2013.

ⓘ Table 33.Environmental impact for mandatory categories per metric ton of Chemcast® Ecogreen® for C1 to C4 + D energy recovery scenario

Categories	Units	C1) Deconstruction demolition	C2) Transport	C3) Waste pro-cessing	C4) Disposal	D) Reuse-Recovery-Recycling-potential
Ionising radiation	kBq U-235 eq	0.00E+00	1.35E+00	0.00E+00	0.00E+00	6.40E+01
Particulate matter	disease inc.	0.00E+00	2.19E-06	0.00E+00	0.00E+00	2.94E-05
Human toxicity, non-cancer	CTUh	0.00E+00	2.48E-07	0.00E+00	0.00E+00	1.52E-05
Human toxicity, cancer	CTUh	0.00E+00	6.25E-09	0.00E+00	0.00E+00	1.32E-06
Ecotoxicity, freshwater	CTUe	0.00E+00	2.40E+02	0.00E+00	0.00E+00	4.48E+04
Land use	Pt	0.00E+00	3.24E+02	0.00E+00	0.00E+00	2.03E+03

ⓘ Table 34.Environmental impact for additional categories per metric ton of Chemcast® Ecogreen® for C1 to C4 + D energy recovery scenario.

8. Additional information

8.1 Sensitive analysis results

As part of the study, a comparative study was carried out between the acrylic sheet Chemcast® GP and Chemcast®Ecogreen® manufactured in Plastiglas de México S.A. de C.V. The results show a reduction in environmental impact of 80% on average for most categories, particularly in the climate change. The comparative results are shown in Figure 9 and 10 for mandatory and additional categories.

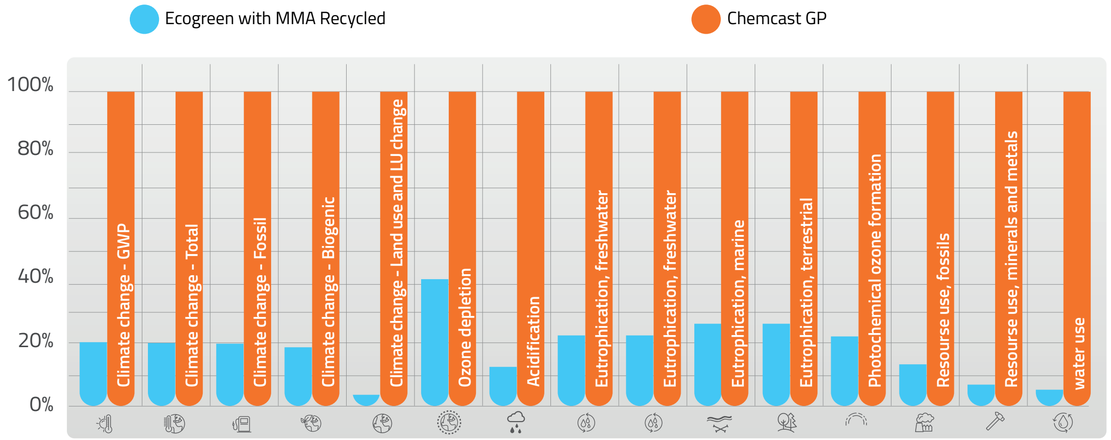

Figure 9 Comparative environmental impact for mandatory categories per metric ton between Chemcast® GP and Chemcast®Ecogreen®

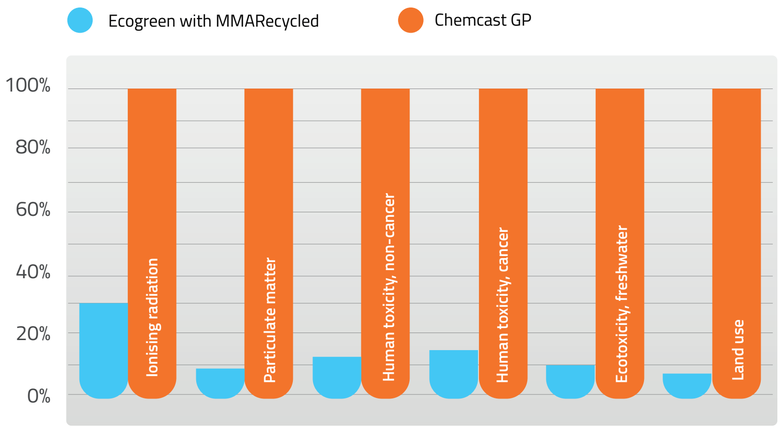

Figure 10. Comparative environmental impact for additional categories per metric ton between Chemcast® GP and Chemcast®Ecogreen®

9. Differences versus previous version

First version of the EPD.

Additional information

Category	Units	Ecogreen with MMA Recycled	Ecogreen with MMA primary origin
Cambio climático- GWP100	kg CO2-eq	8.67E+02	4.27E+03
	%	20.32%	100.00%
Cambio climático - Total	kg CO2 eq	8.16E+02	4.09E+03
	%	19.94%	100.00%
Climate change - Fossil	kg CO2 eq	8.71E+02	4.38E+03
	%	19.90%	100.00%
Climate change - Biogenic	kg CO2 eq	-5.70E+01	-2.98E+02
	%	19.14%	100.00%
Climate change - Land use and LU change	kg CO2 eq	2.52E-01	7.02E+00
	%	3.59%	100.00%
Ozone depletion	kg CFC11 eq	1.02E-04	2.35E-04
	%	43.14%	100.00%
Acidification	mol H+ eq	7.12E+00	5.36E+01
	%	13.27%	100.00%
Eutrophication, freshwater	kg P eq	1.65E-01	6.98E-01
	%	23.71%	100.00%
Eutrophication, freshwater	kg PO4 eq	5.08E-01	2.14E+00
	%	23.71%	100.00%
Eutrophication, marine	kg N eq	2.73E+00	7.99E+00
	%	34.18%	100.00%
Eutrophication, terrestrial	mol N eq	2.91E+01	8.60E+01
	%	33.81%	100.00%
Photochemical ozone formation	kg NMVOC eq	7.34E+00	2.69E+01
	%	27.32%	100.00%
Resource use, fossils	MJ	1.27E+04	9.08E+04
	%	14.01%	100.00%
Resource use, minerals and metals	kg Sb eq	1.34E-03	2.18E-02
	%	6.18%	100.00%
Water use	m3 depriv.	5.67E+02	1.07E+04
	%	5.28%	100.00%

ⓘ Table 35. Comparative environmental impact for basic categories per metric ton of Chemcast® Ecogreen® with MMA Recycled vs with primary origin.

The comparative impact results for mandatory and additional categories are provided in Table 35, 36, respectively
In all impact categories there are significant reductions.

In all impact categories there are significant reductions. In the total climate change category, the carbon footprint reduction of Chemcast® Ecogreen® with recycled methyl methacrylate monomer is 80% compared to the one made with Methyl Methacrylate of primary origin and in water consumption there are a 94.7% decreased.

Category	Units	Ecogreen with MMA Recycled	Ecogreen with MMA primary origin
Ionising radiation	kBq U-235 eq	5.88E+01	1.36E+02
	%	43.35%	100.00%
Particulate matter	disease inc.	3.23E-05	3.10E-04
	%	10.41%	100.00%
Human toxicity, non-cancer	CTUh	5.65E-06	3.55E-05
	%	15.91%	100.00%
Human toxicity, cancer	CTUh	3.12E-07	1.69E-06
	%	18.52%	100.00%
Ecotoxicity, freshwater	CTUe	9.79E+03	8.35E+04
	%	11.73%	100.00%
Land use	Pt	1.10E+04	1.19E+05
	%	9.28%	100.00%

ⓘ Table 36. Comparative environmental impact for additional categories per metric ton of Chemcast® Ecogreen® with MMA Recycled vs with primary origin.

8.2 Circular Economy

Plastiglas de Mexico S.A. de C.V, under the principles of the circular economy and in addition to Eco-design of Chemcast® Ecogreen®, has a campaign to recover post-consumer acrylic sheet scrap and it is through national and international clients and independent collectors that collects the waste to later transform it into methyl methacrylate recycled, a secondary material, which is used for Chemcast® Ecogreen®, thus keeping the material within the system.

8.3 Leadership in Energy and Environmental Design (LEED)

Chemcast® Ecogreen® is consistent with the requirements of the international standard LEED v4.1 as it receives credits for the construction segment of sustainable buildings.

10. Verification and registration

CEN standard EN 15804 served as the core PCR	
Programme	International EPD® System www.environdec.com EPD registered through the fully aligned regional programme/hub: EPD Latin America www.epdlatinamerica.com
Programme operator	EPD International AB Box 210 60 SE-100 31 Stockholm, Sweden EPD Latin America Chile: Alonso de Ercilla 2996, Ñuñoa, Santiago Chile. México: Av. Convento de Actopan 24 Int. 7A, Colonia Jardines de Santa Mónica, Tlalnepantla de Baz, Estado de México, México, C.P. 54050
EPD registration number:	S-P-02009
Date of publication (issue):	2022-08-31
Date of validity:	2027-08-30
Date of revision:	2027-08-30
Reference year of data:	2021
Geographical scope:	Mexico
Central product classification:	UN CPC 36950 Builder´s ware of plastic n.e.c
PCR:	PCR 2019:14 V 1.11 Construction products
PCR review was conducted by:	The Technical Committee of the International EPD® System. See www.environdec.com /TC for a list of members. Review char: Claudia Peña University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact Contact via info@environdec.com
Independent verification of the declaration data, according to ISO 14025:2006.	☐ EPD process certification (Internal) ☒ EPD verification (External)
Third-party verifier: Approved by:	Dr. Rubén Carnerero Acosta Approved EPD verifier r.carnerero@ik-ingenieria.com The International EPD® System
Procedure for follow-up of data during EPD validity involves third-party verifier:	☒ Yes ☐ NO

11.Certifications | 12.Contact information

- Comprehensive Responsibility Certificate by National Association of the Chemical Industry.
- Sanitary Security Distinction by Mexican Social Security Institute.
- Clean Industry Certificate by Environment and Natural Resources Secretary of México.

Contact information

EPD OWNER	LCA AUTOR	PROGRAMME OPERATOR
Plastiglas de México, S.A. de C.V. Plastiglas de México, S.A. de C.V. Av. Acueducto del Alto Lerma #8, zona industrial, Ocoyoacac Estado de México, México C.P. 52740 https://www.plastiglas.com.mx Contact person: Raúl Zepeda Sanabria raul.zepeda@plastiglas.com.mx Contact: +52 722 2796800	Center for Life Cycle Assessment and Sustainable Design – CADIS Bosques De Bohemia 2 No. 9, Bosques del Lago. Cuautitlán Izcalli, Estado de México, México. C.P. 54766 www.centroacv.mx LCA Study: Life Cycle Assessment (LCA) methodology of structural beams hot-rolled manufactured from steel scrap. LCA Authors: Mónica Vulling, Claudia Luque. Contact person: Juan Pablo Chargoy jpchargoy@centroacv.mx	EPD International AB Box 210 60, SE-100 31, Stockholm, Sweden. www.environdec.com info@environdec.com EPD registered through the fully aligned regional programme/hub: EPD Latin America www.epd-latinamerica.com Chile: Alonso de Ercilla 2996, Ñuñoa, Santiago Chile. México: Av. Convento de Actopan 24 Int. 7A, Colonia Jardines de Santa Mónica, Tlalnepantla de Baz, Estado de México, México, C.P. 54050

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