ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 and PCR 2019:14 Construction products and construction services, Version 1.3.4

Chryso®Fluid Optima 100

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

THE INTERNATIONAL EPD® SYSTEM

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
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Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804:2012 + A2:2019 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): *PCR Construction products, PCR 2019:14, version 1.3.4*
PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com for a list of members
Life Cycle Assessment (LCA)
LCA accountability: *Hugo DROUADAINE, Saint Gobain Construction Chemicals*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: *Yannick Le Guern, ELYS Conseil – Yannick.leguern@elys-conseil.com* Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

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

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD: Saint Gobain Construction Chemicals (SGCC)
Contact: Sandrine Mateo, Product Stewardship Director sandrine.mateo@saint-gobain.com
Description of the organisation: Saint Gobain Construction Chemicals designs, manufactures and distributes cement additives and concrete admixtures
Product-related or management system-related certifications: ISO 9001-, 14001-certificates and 45001- certificates.
Name and location of production site(s): Data is collected from one production site of Chryso located in Sermaises in France.

SGCC considers sustainability to be a core value and is currently in the process of conducting several EPDs for varying products. The production of CHRYSO®Fluid Optima 100 is in line with SGCC vision- "Making the world a better home". Our goal is to reduce our footprint and maximise our impact, both on our own operations and by helping our customers building more sustainably.

Product information

Product name: Chryso® Fluid Optima 100
Product identification: This product complies with the NF 085 certification standard whose technical specifications are those of the non-harmonised part of the NF EN 934-2+A1 2012 standard.
Product description: CHRYSO ® Fluid Optima 100 is a new generation superplasticizer based on modified phosphonate. Its specially developed molecular structure gives it exceptional properties in the field of concrete adjuvants. CHRYSO ® Fluid Optima 100 allows very long maintainability at all levels of consistency, compared to conventional additives. Due to its characteristics, CHRYSO ® Fluid Optima 100 appears as a very suitable superplasticizer for civil engineering and the BPE industry.
For more information about the product see the TDS (Technical Data Sheet) on Chryso website www.chryso.com.
Geographical scope: Product is sold worldwide.

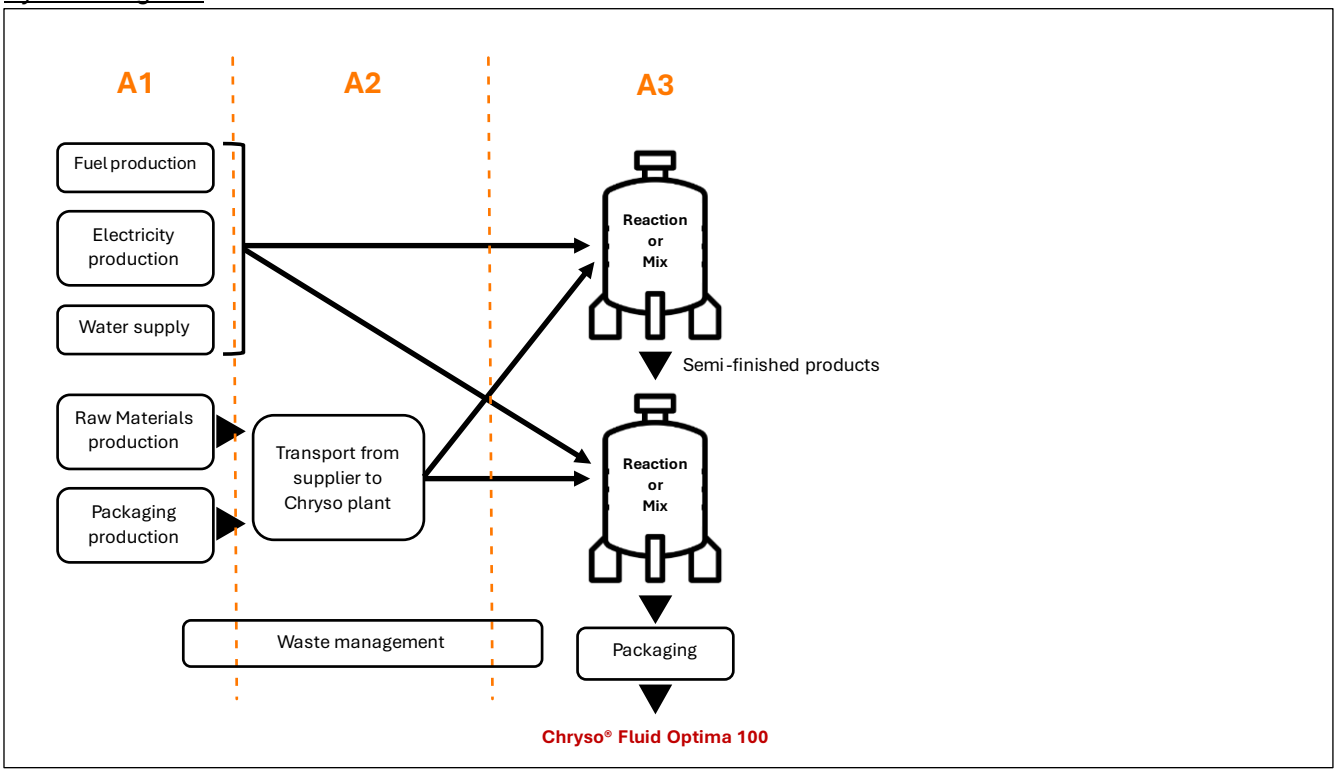
LCA information

Functional unit / declared unit: 1 kilogram of Chryso® Fluid Optima 100 plus the weight of the packaging. The packaging being an average of IBC, drums and bulk.
Reference service life: Not applicable.
Time representativeness: 2022
Database(s) and LCA software used: Sphera 2023.2 & ecoinvent 3.9.1 on software LCA for Experts 10.9.0.31, emission factors EF 3.1.
Description of system boundaries:
Cradle to gate (A1–A3).
The product considered in this EPD® is a construction product physically integrated with other products during its installation stage and cannot be physically separated from them at the end of life. Moreover, the product is no longer identifiable at the end of life, after the physical or chemical transformation. Finally, the product doesn't contain biogenic carbon.
As a result, only the production stage A1-A3 is declared.

A1 Raw material supply This module takes into account the supply and processing of all raw materials and energies that occur upstream of the manufacturing process. The packaging of raw materials is taken into account.

A2 Transport to the manufacturer Raw materials are transported to the manufacturing site. The modelling includes, for each of the raw materials truck, boat or rail transport (average values).
A3 Manufacturing This module takes into account the manufacture of the product and packaging. Processing to end-of-waste status or disposal of final residues, including for packages that do not pass through the plant door with the product are included in modules A1-A3.

System diagram:



More information:
Raw materials which are purchased from external suppliers are either stored in silos and added automatically in the production mixer if they are received in bulk or stored in the warehouse and manually added in the reaction batch if received in tanks, bag or big bags.
All the components are mechanically mixed in heated batches in a discontinuous process. The semi-finished product are then mixed with the rest of the raw materials. In the end the packaged finished product is put on wooden pallets and stored in the finished products warehouse. The quality of final products is controlled before the sale.

Name and contact information of LCA practitioner: Hugo Drouadaine Project Manager Life Cycle Analysis hugo.drouadaine@saint-gobain.com

Cut-off rules :

No cut-off rules have been applied.
Flows related to human activities such as employee transport are excluded.
The construction of plants, production of machines and transportation systems are excluded since the related flows are supposed to be negligible compared to the production of the building product when compared at these systems lifetime level.

Allocation rules :

Allocation was avoided by dividing the processes into subprocesses to which to attribute the respective input / output flows.
As there are no coproducts, no allocation criteria were used.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results): (X = Declared, MND = module not declared)

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Geography	FR	FR	FR														
Specific data used	<11% for GWP - fossil					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Weight, %	Post-consumer recycled material, weight-%	Biogenic material, weight-% and kg C/kg
Organic additives	<40%	0	0
Water	<70%	0	0
TOTAL	100	0	0
Packaging materials	**Weight, kg/DU**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
HDPE (averaged packaging: IBC and drums)	3,8E-03	<0,4%	0
Metal (IBC)	8,1E-03	<0,9%	0
Wood (IBC)	4,2E-03	<0,5%	1,72E-03
TOTAL	1,61E-02	<1,8%	1,72E-03

The product does not contain a concentration higher than 0,1% (by unit weight) of either carcinogenic substances or substances of very high concern (SVHC) on the REACH Candidate List published by the European Chemicals Agency.

Results of the environmental performance indicators

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
GWP-fossil	kg CO_2 eq.	1,14E+00
GWP-biogenic	kg CO_2 eq.	-1,32E-02
GWP-luluc	kg CO_2 eq.	6,35E-03
GWP-total	kg CO_2 eq.	1,14E+00
ODP	kg CFC 11 eq.	2,86E-09
AP	mol H^+ eq.	6,81E-03
EP-freshwater	kg P eq.	2,79E-04
EP-marine	kg N eq.	2,00E-03
EP-terrestrial	mol N eq.	1,08E-02
POCP	kg NMVOC eq.	3,03E-03
ADP-minerals&metals*	kg Sb eq.	1,38E-06
ADP-fossil*	MJ	2,54E+01
WDP*	m^3	3,63E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption	

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
GWP-GHG[1]	kg CO_2 eq.	1,20E+00
Particulate matter*	Disease incidences	1,28E-07
Ionising radiation, human health**	kBq U235 eq.	7,83E-02
Ecotoxicity, freshwater*	CTUe	8,08E+01
Human toxicity, cancer*	CTUh	8,41E-10
Human toxicity, non-cancer*	CTUh	1,36E-07
Land Use*	Pt	2,68E+00

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*
*** This category of impact mainly concerns the possible impact on health human exposure to low-dose ionizing radiation from the nuclear fuel cycle. It does not take into account the consequences of possible nuclear accidents, occupational exposure or the disposal of radioactive waste in underground installations. Potential ionizing radiation from soil, radon and certain construction materials are also not measured by this indicator.*

Resource use indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
PERE	MJ	8,59E-01
PERM	MJ	1,83E-01
PERT	MJ	1,04E+00
PENRE	MJ	2,48E+01
PENRM	MJ	5,83E-01
PENRT	MJ	2,54E+01
SM	kg	1,52E-02

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

RSF	MJ	0,00E+00
NRSF	MJ	0,00E+00
FW	m^3	8,48E-02
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy 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 non-renewable primary energy 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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water	

Waste indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
Hazardous waste disposed	kg	9,74E-11
Non-hazardous waste disposed	kg	4,02E-03
Radioactive waste disposed	kg	2,25E-04

Output flow indicators

Results per functional or declared unit		
Indicator	**Unit**	**A1-A3**
Components for re-use	kg	0,00E+00
Material for recycling	kg	4,09E-02
Materials for energy recovery	kg	0,00E+00
Exported energy, electricity	MJ	0,00E+00
Exported energy, thermal	MJ	0,00E+00

Additional environmental information

Electricity information

PARAMETER	DESCRIPTION
Location	Sermaises-du-Loiret, France
Geographical representativness description	- Nuclear 82,70 % - Hard coal 0,87 % - Natural Gas 7,53 % - Oil 0,44 % - Biomass 1,00 % - Hydro 2,04 % - Wind 3,12 % - Solar 1,85 % - Geothermal 0,02 % - Unspecified fossil origin 0,43 %
Reference year	2021
Type of dataset	Cradle-to-gate
Source	Sphera database The French electricity residual mix is considered according to 2022 AIB data
GWP-GHG	0,05581 CO_2 eqv/kWh according to the indicators of EN15804+A2

Data quality

Inventory data quality is judged by geographical, temporal, and technological representativeness. To cover these requirements and to ensure reliable results, first-hand industry data crossed with LCA background datasets were used. The data was collected from internal records and reporting documents. After evaluating the inventory, according to the defined ranking in the LCA report, the assessment reflects “good” inventory data quality.

Geographic representativity	Technical representativity	Temporal representativity
2,8	**2,9**	**1,9**

References

General Programme Instructions of the International EPD® System. Version 4.0.
PCR 2019:14. Construction Products. Version 1.3.4

1. ISO 14040:2006 Environmental Management-Life Cycle Assessment-Principles and framework.
2. ISO 14044:2006 Environmental Management-Life Cycle Assessment Requirements and guidelines.
3. ISO 14025:2006 Environmental labels and Declarations-Type III Environmental Declarations-Principles and procedures.
4. EN 15804:2019+A2 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
5. EPD International. General Program Instructions (GPI) for the International EPD® System (version 4.0) www.environdec.com.
6. The International EPD System PCR 2019:14 Construction products and Construction services. Version 1.3.4
7. European Chemical Agency, Candidate List of substances of very high concern for Authorization. http://echa.europa.eu/fr/candidate-list-table
8. LCA report named Rapport d'accompagnement v1.4

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