ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

Concrete for Slab Production, Fanadir Marine Project in Al Gouna

Red Sea Ready Mix (Orascom)

EPD HUB, HUB-0167

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Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Red Sea Ready Mix (Orascom)
Address	Head Office: 2005 A Corniche El Nil, Ramlet Boulaq, Nile City Towers, North Tower, 14th Floor – Cairo EGYPT
Contact details	Josepheasa@elgouna.com
Website	http://www.rsc.com.eg/

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	ISO 21930:2017 and ISO 14025
PCR	EPD Hub Core PCR version 1.0, 1 Feb 2022
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate
EPD author	Shirin Fataei - Master Builders Solutions
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	S.V, as an authorized verifier acting for EPD Hub Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	Concrete for Slab Production
Place of production	El Gouna, Egypt
Period for data	2021
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	-

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 cubic meter
Declared unit mass	2337.5 kg
GWP-fossil, A1-A3 (kgCO2e)	265.0
GWP-total, A1-A3 (kgCO2e)	268.0
Secondary material, inputs (%)	0.00306
Secondary material, outputs (%)	0.0
Total energy use, A1-A3 (kWh)	620.0
Total water use, A1-A3 (m^3e)	3.67

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

The RED SEA MIX Company is considered as the newest company in Hurghada, that uses the latest technologies in this field to produce high quality ready-mixed concrete and meet sustainability requirements.

The RED SEA MIX Company (Orascom) was established in December 2007 and the first production took place in June 2008, specializing in the production of ready-mixed concrete.

PRODUCT DESCRIPTION VP-009

Concrete is a composite material consisting of a binding medium (cement paste, hydraulic cement and water, and possibly one or more admixtures) combined with fine aggregates (usually sand) and coarse aggregates (usually gravel) to form a hard, solid mass. The most commonly used hydraulic cement is Portland cement, but other hydraulic cements include blended cements and cementitious materials such as ground granulated blast furnace slag (GGBFS)are also used. Pozzolans, both natural and artificial (e.g., fly ash and silica fume) are often used as supplementary cementitious materials. This specific concrete mix was optimized for sustainability by adding crushed waste aggregate and available supplementary cementitious materials.

Further information can be found at http://www.rsc.com.eg/.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0	-
Minerals	99.55	Egypt
Fossil materials	0.45	Egypt
Bio-based materials	0	-

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 cubic meter
Mass per declared unit	2337.5 kg
Reference service life	50 years

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

First, the dosed aggregates are mixed with cement and other additives (binder) in the dry state. Then, the water is added to the dry in order to obtain a plastically deformable fresh concrete. In the precast concrete plant, the fresh concrete is transported via bucket conveyors and concrete distributors into the prepared formwork and compacted. The components can then be heat-treated for a few hours to improve the hardening process. After approx. 12 to 18 hours, the parts are removed from their formwork and stored in the storage yard for further curing until transport to the construction site.

Ready-mix concrete and precast concrete elements are delivered without the use of packaging material.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. Precast concrete elements are assembled on site by truck-mounted cranes or tower cranes.

Transport to construction site and assembly is not covered in this EPD.

PRODUCT USE AND MAINTENANCE (B1-B7)

Concrete is a versatile building material used in the building industry. It is used in building construction mainly for ceilings, walls, stairs, foundations, columns, and trusses, in underground construction for components in contact with the ground, foundations, floor slabs, bored piles and in civil engineering for example bridges.

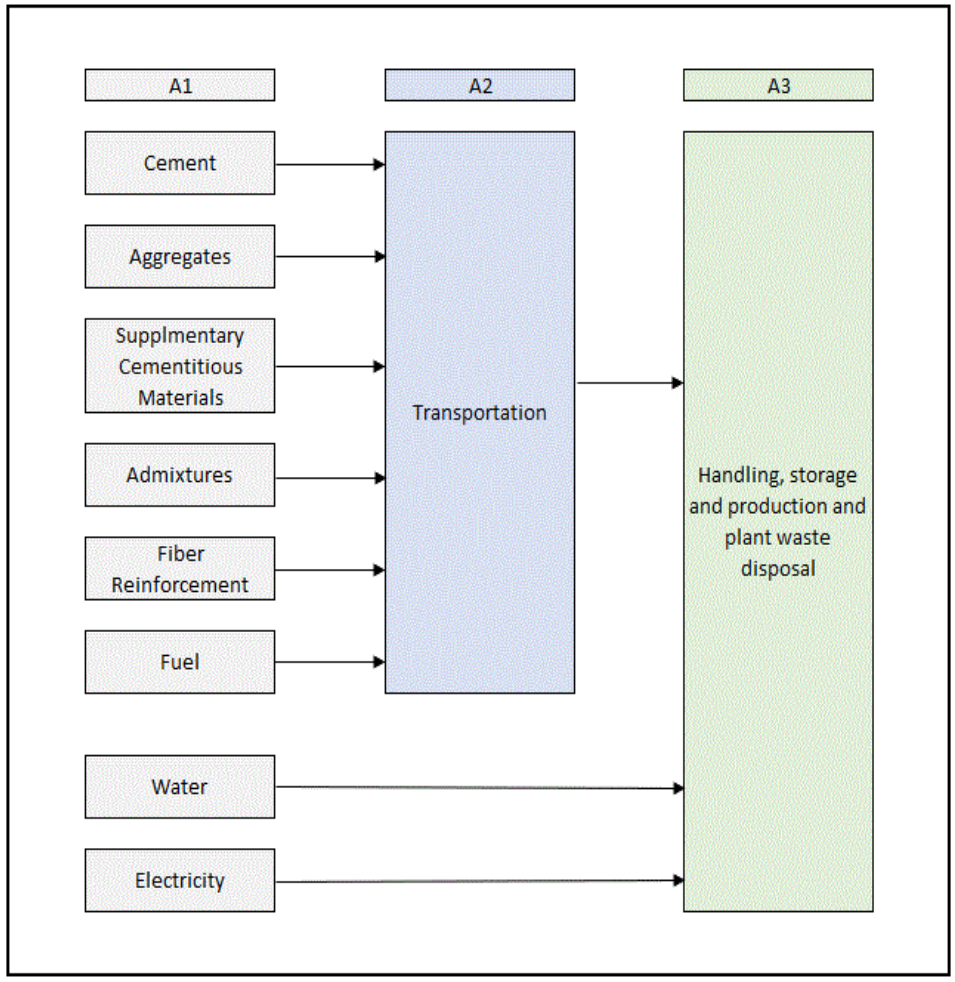
Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

Components made of concrete can be deconstructed. For the recycling of reinforced components, the concrete demolition is separated from the reinforcing steel and processed. For this purpose, the concrete is first crushed, separated into individual grain fractions, and then used in road construction or in small portions as recycled aggregate in the production of fresh concrete.

This EPD does not include end of life studies.

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

No cut-off was applied in the LCA calculation. All raw materials used were taken into consideration. Manufacture of machinery, buildings, and other infrastructure was not included in the LCA.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging materials	No allocation
Ancillary materials	No allocation
Manufacturing energy and waste	No allocation

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	-

This EPD is product and factory specific and does not contain average calculations.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent and One Click LCA databases were used as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	2,36E2	1,16E1	5,64E0	2,53E2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Ozone depletion Pot.	kg CFC_{-11}e	7,05E-6	2,11E-6	7,67E-6	1,68E-5	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Acidification	kg SO_2e	5,26E-1	3,5E-2	6,1E-2	6,22E-1	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Eutrophication	kg PO_4^3e	1,66E-1	7,91E-3	7,59E-3	1,82E-1	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
POCP (“smog”)	kg C_2H_4e	2,26E-2	1,5E-3	2,47E-3	2,66E-2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADP-elements	kg Sbe	2,3E-2	1,97E-4	2,67E-5	2,32E-2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADP-fossil	MJ	1,63E3	1,79E2	5,97E2	2,4E3	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	2,5E2	1,17E1	5,88E0	2,68E2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWP – fossil	kg CO_2e	2,48E2	1,17E1	5,86E0	2,65E2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWP – biogenic	kg CO_2e	2,25E0	6,54E-3	1,35E-2	2,27E0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
GWP – LULUC	kg CO_2e	1,09E-1	3,65E-3	1,87E-3	1,15E-1	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Ozone depletion pot.	kg CFC_{-11}e	8,59E-6	2,65E-6	9,69E-6	2,09E-5	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Acidification potential	mol H^+e	7,13E-1	4,98E-2	7,16E-2	8,34E-1	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EP-freshwater[2)]	kg Pe	3,37E-3	1,11E-4	7,53E-5	3,55E-3	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EP-marine	kg Ne	2,01E-1	1,48E-2	9,17E-3	2,25E-1	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EP-terrestrial	mol Ne	2,25E0	1,63E-1	9,99E-2	2,51E0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
POCP (“smog”)[3)]	kg NMVOCe	5,82E-1	5,21E-2	4,07E-2	6,75E-1	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADP-minerals & metals[4)]	kg Sbe	2,3E-2	1,97E-4	2,67E-5	2,32E-2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADP-fossil resources	MJ	1,63E3	1,79E2	5,97E2	2,4E3	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Water use[5)]	m^3e depr.	1,08E2	7,58E-1	3,45E-1	1,09E2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	6,04E-6	1,04E-6	3,6E-7	7,44E-6	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Ionizing radiation[6]	kBq U235e	4,43E0	7,54E-1	2,62E0	7,8E0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Ecotoxicity (freshwater)	CTUe	2,72E3	1,47E2	3,05E2	3,17E3	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Human toxicity, cancer	CTUh	5,39E-8	3,52E-9	2,5E-9	5,99E-8	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Human tox. non-cancer	CTUh	1,9E-6	1,63E-7	7,7E-8	2,14E-6	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
SQP[7]	-	7,48E2	2,67E2	9,66E0	1,02E3	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8]	MJ	9,7E1	1,92E0	1,43E0	1E2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Renew. PER as material	MJ	4,9E0	0E0	0E0	4,9E0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Total use of renew. PER	MJ	1,02E2	1,92E0	1,43E0	1,05E2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-re. PER as energy	MJ	1,36E3	1,79E2	5,97E2	2,13E3	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-re. PER as material	MJ	2,71E2	0E0	0E0	2,71E2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Total use of non-re. PER	MJ	1,63E3	1,79E2	5,97E2	2,4E3	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Secondary materials	kg	4,06E-2	0E0	3,09E-2	7,15E-2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Use of net fresh water	m^3	3,51E0	3,74E-2	1,27E-1	3,67E0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	5,08E0	2,16E-1	1,47E-1	5,44E0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Non-hazardous waste	kg	1,65E2	1,96E1	2,46E0	1,88E2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Radioactive waste	kg	8,32E-3	1,2E-3	4,33E-3	1,38E-2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Materials for recycling	kg	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Materials for energy rec	kg	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Exported energy	MJ	0E0	0E0	0E0	0E0	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

ENVIRONMENTAL IMPACTS – TRACI 2.1. / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	2,36E2	1,16E1	5,66E0	2,54E2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Ozone Depletion	kg CFC_{-11}e	9,36E-6	2,81E-6	1,02E-5	2,24E-5	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Acidification	kg SO_2e	6,21E-1	4,36E-2	5,8E-2	7,23E-1	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Eutrophication	kg Ne	6,02E-2	6,05E-3	1,47E-2	8,1E-2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
POCP (“smog”)	kg O_3e	1,2E1	9,36E-1	5,73E-1	1,35E1	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADP-fossil	MJ	1,5E2	2,53E1	9,04E1	2,66E2	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Silvia Vilčeková, as an authorized verifier acting for EPD Hub Limited
28.10.2022

VERIFIED ISO 14025