

# EMCON



## Environmental Product Declaration

A cradle-to-gate EPD according to ISO 14025 and ISO 21930

Concrete Masonry Products as  
Manufactured by EMCON LLC



ASTM  
INTERNATIONAL

## About EMCON

EMCON L.L.C. was established by Al Naboodah Laing in 1978 to supply concrete blocks to the construction industry in UAE and was part of the group till June 2000.

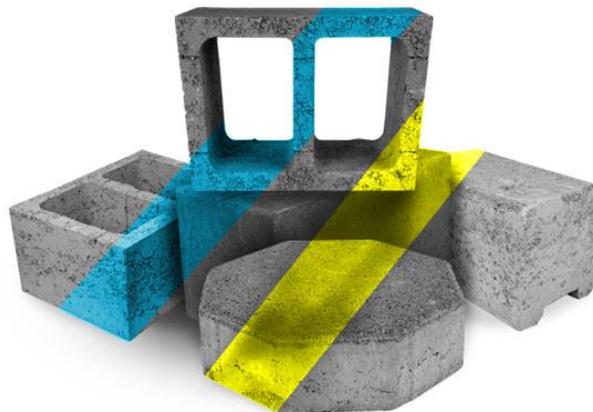
EMCON gradually emerged stronger and bigger, supplying to more than 3000 major projects in UAE and serving more than 700 customers. EMCON has successfully supplied to prestigious projects like Burj Khalifa, Burj Al Arab, Emirates Tower, Airport Expansion and Grand Hyatt to name a few.

EMCON is fully equipped and geared to meet new challenges with its present capacity of producing a variety of concrete blocks and interlocking tiles to serve the construction industry. Situated in Al Quoz Industrial area of Dubai and Hamriya Free Zone (Sharjah), we are equipped with modern plants such as MASA 9001 XL to produce standard and special range of products. Our Deliveries to site are achieved by our fleet of vehicles which are all fitted with mechanical off-loading facility.

EMCON have many specialty products and we are known for our innovative products range such as Concrete Lightweight and Normal weight Masonry Blocks, Thermal Insulated Blocks, Concrete Interlock pavers, Concrete Tiles, Concrete Kerbs...etc.

EMCON blocks and interlocking tiles are manufactured under strict quality-controlled conditions using high quality materials to ensure high class products are delivered to the clients to suit their needs.

EMCON is an ISO 9001 : 2015 & 14001 : 2015 Certified Company and is approved by Dubai Municipality, Dubai Civil Defense, DCA, Dubai Development Board, Ministry of Public Works-DUBAI, Nakheel, Emaar etc. ..



## ASTM International Certified EPD

This is a business-to-business Type III environmental product declaration (EPD) for concrete masonry products as manufactured by EMCON LLC. This declaration has been prepared in accordance with ISO 14025 and ISO 21930, and the ASTM product category rules (PCR) and EPD program operator rules.

The intent of this document is to further the development of environmentally compatible and more sustainable construction products by providing comprehensive environmental information related to potential impacts of concrete masonry products available in the UAE in accordance with international standards.

### Program Operator



**ASTM International**  
Environmental Product Declarations  
100 Barr Harbor Drive,  
West Conshohocken,  
PA 19428-2959  
[www.astm.org](http://www.astm.org)

### Owner of the EPD



**EMCON LLC**  
Post Box # 62942  
Dubai, United Arab Emirates  
[www.emcongcc.com](http://www.emcongcc.com)

### Concrete Consultant



**Grey Matters Consultancy**  
P.O. Box: 283079  
Dubai Investment Park  
Dubai - UAE  
[www.greymatters.ws](http://www.greymatters.ws)

### EPD Information

<b>Product Names</b> Concrete masonry units, concrete pavers, concrete roof tiles	<b>Product Definition</b> Manufactured masonry unit made of concrete in which the binder is a combination of water and cementitious materials
--	--

<b>Declared Unit</b> 1 m <sup>3</sup> concrete masonry product	<b>Declaration Number</b> EPD-110
---	--------------------------------------

**Declaration Type**  
A “cradle-to-gate” EPD - activity stages or information modules covered include production (modules A1 to A3). The declaration is intended for use in Business-to-Business (B-to-B) communication. This EPD of concrete masonry products (UN CPC 3755) is applicable to those manufactured at the EMCON facility.

**Content of the Declaration**  
The declaration follows Section 11, Content of the EPD, ASTM International, Product Category Rules for Preparing an Environmental Product Declaration For Manufactured Concrete and Concrete Masonry Products.



## Declaration Comparability Limitation Statement

The following ISO statement indicates the EPD comparability limitations and intent to avoid any market distortions or misinterpretation of EPDs based on the ASTM's PCR: 2014:

- EPDs from different programs (using different PCR) may not be comparable.
- Declarations based on the ASTM PCR are not comparative assertions; that is, no claim of environmental superiority may be inferred or implied.

### Applicable Countries

United Arab Emirates

### Date of Issue

July 26 2019

### Period of Validity

5 years

### EPD Prepared by



**Athena**  
Sustainable Materials  
Institute

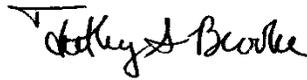
Athena Sustainable Materials Institute  
119 Ross Avenue, Suite 100  
Ottawa, Ontario, K1Y 0N6, Canada

This EPD was independently verified by ASTM in accordance with ISO 14025:

Internal

External

X



Timothy Brooke, ASTM International  
100 Barr Harbor Dr.  
West Conshohocken, PA 19428  
cert@astm.org

## EPD Project Report Information

### EPD Project Report

*A Cradle-to-Gate Life Cycle Assessment of Concrete Masonry and Paver Products Manufactured by EMCON LLC in the Emirate of Dubai, UAE, June 2019.*

The report is available upon request at [cert@astm.org](mailto:cert@astm.org).

### EPD Project Prepared by



**Athena**  
Sustainable Materials  
Institute

Athena Sustainable Materials Institute  
119 Ross Avenue, Suite 100  
Ottawa, Ontario, K1Y 0N6, Canada

This EPD and EPD project report were independently verified by in accordance with ISO 14025 and the reference PCR:

Thomas Gloria, Ph.D. (LCACP ID: 2008-03)  
Industrial Ecology Consultants  
Email: [info@industrial-ecology.com](mailto:info@industrial-ecology.com)

## PCR Information

Reference PCR

ASTM International, Product Category Rules For Preparing an Environmental Product Declaration For Manufactured Concrete and Concrete Masonry Products

Date of Issue

December 2014

PCR review was conducted by:

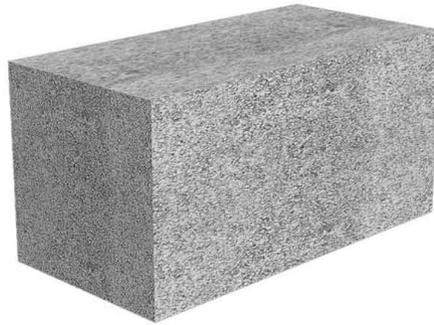
Nicholas Santero, PE International (Chairperson)  
Christine Subasic, Consulting Architectural Engineer  
Juan Tejeda, ORCO Block Company

Contact information available upon request at [cert@astm.org](mailto:cert@astm.org).

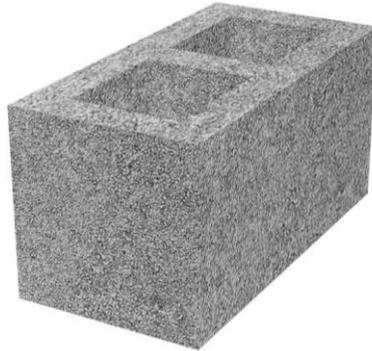
## 1. PRODUCT IDENTIFICATION

This EPD reports environmental information for the three concrete masonry products shown in Figure 1 below, produced by EMCON in Dubai, United Arab Emirates.

**Figure 1: EMCON Concrete Masonry Products**



Solid Blocks



Hollow Blocks



Thermal Blocks

Concrete masonry units (CMUs) are typically used in load-bearing and partition wall construction. The blocks are laid in horizontal rows; successive rows are bound by mortar beds and optionally reinforced with steel reinforcing and/or concrete grout. CMUs are also used in masonry column and beam construction.

## 2. DECLARED UNIT

The declared unit is 1 m<sup>3</sup> of concrete masonry product.

## 3. MATERIAL CONTENT

Table 1 below presents the material content by input material for the three concrete masonry products, as provided by EMCON.

**Table 1: Material Content of Concrete Masonry Products**

Material	Units	Solid Blocks	Hollow Blocks	Thermal Blocks
Water	l	96	72	80
Portland Cement	kg	141	136	177
Crushed Coarse Aggregate	kg	640	489	553
Crushed Fine Aggregate	kg	1,344	750	708
EPS insulation	kg	0	0	8
<b>Total</b>		<b>2,125</b>	<b>1,375</b>	<b>1,445</b>

## 4. SYSTEM BOUNDARY

As per the ASTM PCR, the system boundary is the product stage, which includes the following modules:

- A1 Raw material supply;
- A2 Transport (to the manufacturer); and
- A3 Manufacturing.

Figure 2 shows the production stage system boundary for concrete masonry products.

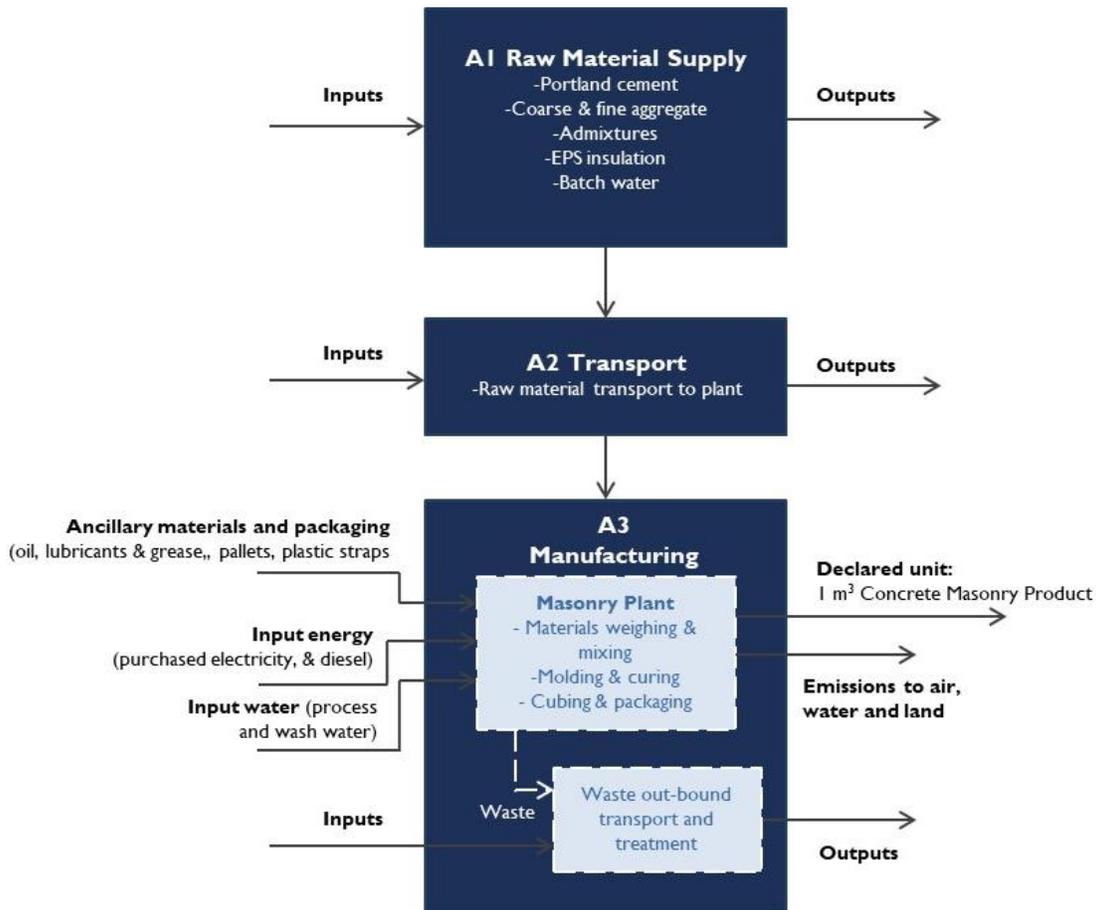


Figure 2: Product Stage (module A1 to A3) System Boundary

## 5. LIFE CYCLE ASSESSMENT

This section summarizes the results of the life cycle impact assessment (LCIA) based on the cradle-to-gate life cycle inventory inputs and outputs analysis. The results are calculated on the basis of 1 m<sup>3</sup> concrete masonry product (Table 2 through 4.**Error! Reference source not found.**). The production results are delineated by information modules A1 through A3.

As per the ASTM PCR, Section 8, US EPA Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI, version 2.1) impact categories are used for the mandatory category indicators to be included in this EPD. These are relative expressions only and do not predict category impact end-points, the exceeding of thresholds, safety margins or risks. Total primary and sub-set energy consumption was compiled using a cumulative energy demand model. Material resource consumption and generated waste reflect cumulative life cycle inventory flow information.

**Table 2: LCA results – Solid Blocks, per m<sup>3</sup>**

Environmental Indicator	Unit	A1 Raw Material Supply	A2 Transport	A3 Manufacturing	Total
<b>TRACI 2.1 impact categories</b>					
Global warming potential	kg CO <sub>2</sub> eq.	154.10	44.26	5.57	203.93
Acidification potential	kg SO <sub>2</sub> eq.	0.48	0.28	0.02	0.78
Eutrophication potential	kg N eq.	0.19	0.03	0.00	0.22
Smog creation potential	kg O <sub>3</sub> eq.	7.31	7.37	0.31	14.99
Ozone depletion potential	kg CFC-11 eq.	1.43E-05	1.08E-05	1.51E-06	2.66E-05
<b>Total primary energy consumption</b>					
Non-renewable fossil	MJ (HHV)	1304.28	686.92	104.31	2095.51
Non-renewable nuclear	MJ (HHV)	68.65	36.15	5.49	110.29
Renewable (non-biomass)	MJ (HHV)	4.30	4.26	0.38	8.94
Renewable (biomass)	MJ (HHV)	5.25	5.21	0.47	10.93
<b>Material resources consumption</b>					
Non-renewable material resources	kg	2291.75	50.93	0.20	2342.88
Renewable material resources	kg	1.21	0.17	0.01	1.38
Net fresh water	l	1209.12	0.00	177.54	1386.66
<b>Waste generated</b>					
Non-hazardous waste generated	kg	0.02	0.00	19.34	19.36
Hazardous waste generated	kg	0.00	0.00	0.00	0.00

**Table 3: LCA results – Hollow Blocks, per m<sup>3</sup>**

Environmental Indicator	Unit	A1 Raw Material Supply	A2 Transport	A3 Manufacturing	Total
<b>TRACI 2.1 impact categories</b>					
Global warming potential	kg CO <sub>2</sub> eq.	141.09	27.97	3.60	172.66
Acidification potential	kg SO <sub>2</sub> eq.	0.43	0.17	0.01	0.62
Eutrophication potential	kg N eq.	0.18	0.02	0.00	0.20
Smog creation potential	kg O <sub>3</sub> eq.	6.39	4.66	0.20	11.25
Ozone depletion potential	kg CFC-11 eq.	1.22E-05	6.85E-06	9.75E-07	2.00E-05
<b>Total primary energy consumption</b>					
Non-renewable fossil	MJ (HHV)	1129.89	434.01	67.49	1631.39
Non-renewable nuclear	MJ (HHV)	59.47	22.84	3.55	85.86
Renewable (non-biomass)	MJ (HHV)	3.79	2.69	0.25	6.73
Renewable (biomass)	MJ (HHV)	4.63	3.29	0.30	8.23
<b>Material resources consumption</b>					
Non-renewable material resources	kg	1499.94	32.18	0.13	1532.25
Renewable material resources	kg	1.12	0.10	0.00	1.23
Net fresh water	l	1116.46	0.00	114.88	1231.34
<b>Waste generated</b>					
Non-hazardous waste generated	kg	0.02	0.00	12.51	12.53
Hazardous waste generated	kg	0.00	0.00	0.00	0.00

**Table 4: LCA results – Thermal Blocks, per m<sup>3</sup>**

Environmental Indicator	Unit	A1 Raw Material Supply	A2 Transport	A3 Manu- facturing	Total
<b>TRACI 2.1 impact categories</b>					
Global warming potential	kg CO <sub>2</sub> eq.	208.03	28.72	2.52	239.27
Acidification potential	kg SO <sub>2</sub> eq.	0.64	0.18	0.01	0.83
Eutrophication potential	kg N eq.	0.24	0.02	0.00	0.26
Smog creation potential	kg O <sub>3</sub> eq.	9.20	4.78	0.14	14.13
Ozone depletion potential	kg CFC-11 eq.	1.52E-05	7.04E-06	6.82E-07	2.29E-05
<b>Total primary energy consumption</b>					
Non-renewable fossil	MJ (HHV)	2079.43	445.68	47.25	2572.36
Non-renewable nuclear	MJ (HHV)	109.44	23.46	2.49	135.39
Renewable (non-biomass)	MJ (HHV)	6.10	2.77	0.17	9.04
Renewable (biomass)	MJ (HHV)	7.45	3.38	0.21	11.05
<b>Material resources consumption</b>					
Non-renewable material resources	kg	1581.24	33.04	0.09	1614.37
Renewable material resources	kg	1.44	0.11	0.00	1.55
Net fresh water	l	1420.64	0.00	80.41	1501.06
<b>Waste generated</b>					
Non-hazardous waste generated	kg	0.02	0.00	8.76	8.78
Hazardous waste generated	kg	0.00	0.00	0.00	0.00