

Environmental Product Declaration

Endicott Brick

Clay Masonry Products



Clay brick, clay brick pavers, clay thin brick, and structural clay tile are manufactured masonry units made by forming and firing prepared mixtures of clay, shale, and other materials to a high enough temperature to create amorphous material in a vitreous (glassy) or ceramic bonding phase.

Endicott Clay Products is a company built on a foundation of quality, durability, and a profound respect for the natural resources that make our exceptional products possible. For over a century, we have operated with the understanding that stewardship of the environment is not a trend, but a core responsibility of extracting and utilizing natural materials. Our long-standing commitment is to continuously improve our production processes, ensuring that the legacy of our products is matched by a legacy of sustainability and operational efficiency. We are dedicated to delivering products that not only last for generations but are also produced in a manner that honors our planet.



**Certified
Environmental
Product Declaration**

www.nsf.org

Environmental Product Declaration

Endicott Brick

Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025 and ISO 21930. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. Accuracy of Results: EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	NSF International 789 N. Dixboro Road, Ann Arbor, MI 48105, USA https://www.nsf.org/	
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	NSF/ASTM Clay Masonry Products PCR, NSF Program Operator Rules (2015)	
MANUFACTURER NAME AND ADDRESS	Endicott Endicott Clay Products Company/Endicott Thin Brick & Tile, LLC P.O. Box 17 Fairbury, NE 68352	
DECLARATION NUMBER	EPD11238	
DECLARED PRODUCT & FUNCTIONAL UNIT	Endicott Brick - Clay Masonry Products Functional Unit = 1 square meter of installed clay brick product over 75 year building lifetime (See section 'Functional Unit' for full description per product category)	
REFERENCE PCR AND VERSION NUMBER	NSF/ASTM Clay Masonry Products PCR	
DESCRIPTION OF PRODUCT(S) APPLICATION/USE	Clay masonry products fulfill multiple functions in wall and paving applications, including but not limited to, serving as a cladding, structural wall, or solid base for pedestrian and vehicular traffic.	
PRODUCT RSL DESCRIPTION	150 years	
MARKETS OF APPLICABILITY	North America	
DATE OF ISSUE	3/5/2026	
PERIOD OF VALIDITY	5 years	
EPD TYPE	Facility-Specific Product-Specific	
DATASET VARIABILITY	N/A	
EPD SCOPE	Cradle-to-Grave	
YEAR(S) OF REPORTED PRIMARY DATA	2023	
LCA SOFTWARE & VERSION NUMBER	SimaPro v9.6	
LCI DATABASE(S) & VERSION NUMBER	Ecoinvent v3.11 & USLCI v2.0	
LCIA METHODOLOGY & VERSION NUMBER	TRACI 2.2	
The sub-category PCR review was conducted by:	Jack Geibig - 	
This declaration was independently verified in accordance with ISO 14025: 2006. The NSF/ASTM Clay Masonry Products PCR <input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL		
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Jack Geibig - 	

The EPD Owner has sole ownership, responsibility, and liability for the content of this EPD

Environmental Product Declaration

Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

General Information

Description of Company/Organization

Endicott Clay Products Company was founded in 1920 and for over 100 years has provided products of the highest quality and visual appeal. Known for their unique Ironspot clays, Endicott provides a multitude of colors to fit any project.

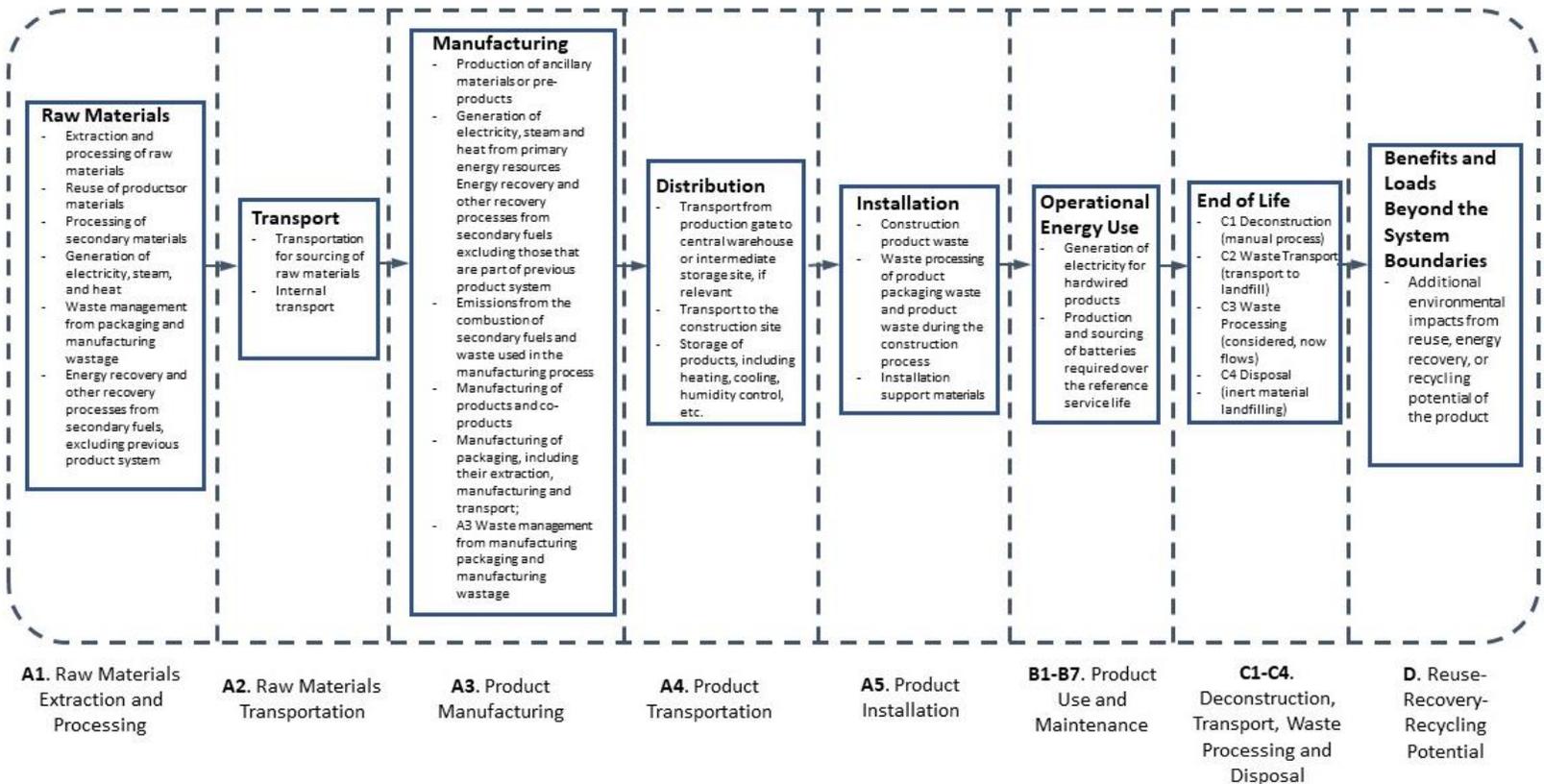
Product Description

Products manufactured by Endicott Clay Products are manufactured to meet the respective specifications noted: □

- * ASTM C216.....Facing Brick
- * ASTM C652.....Hollow Clay Brick
- * ASTM C902.....Pedestrian and Light Traffic Paving Brick
- * ASTM C1088.....Thin Veneer Brick
- * ASTM C1272.....Heavy Vehicular Paving Brick

This EPD represents brick products from the following Endicott facilities: Endicott, Nebraska.

Flow Diagram



Environmental Product Declaration

Endicott Brick

Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Manufacturer Specific EPD

This product-specific EPD was developed based on a Cradle-to-Grave Life Cycle Assessment. The EPD accounts for raw material extraction and processing, transport, product manufacturing, distribution, installation, maintenance, disposal, and potential benefits and loads following the end-of-life disposal. Manufacturing data were gathered directly from company personnel. When company-specific data were not available for a given process input, the BIA Industry Average LCA value was used as a proxy. For any product group EPDs, an impact assessment was completed for each product and the highest impacts were reported as conservative representations of the product group. Product grouping was considered appropriate if the individual product impacts differed by no more than $\pm 10\%$ in any impact category.

Application

Clay masonry products are versatile and ideal for a wide range of applications. These products are commonly used to construct interior and exterior walls in both structural and veneer applications, interior and exterior paving applications, and other assemblies.

Material Composition

The primary product components and/or materials must be indicated as a percentage mass to enable the user of the EPD to understand the composition of the product in delivery status. No regulated hazardous or toxic substances that pose a concern to human health and/or the environment are present in the products described in this study.

The average composition of the brick products are as follows:

Material	Clay Brick Assemblies
Mined Clay and Shale	98.94%
External Grog	0.00%
Primary Pigments	0.59%
Body additives	0.46%
Sand	0.00%
Total	100%

Properties of Declared Product as Shipped

Clay masonry products are most often packaged and shipped in cubes or by pallet. To protect the load, dividers of paper or wood may be used, and the packaged is secured with plastic straps.

Environmental Product Declaration

Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Methodological Framework

Functional Unit

This EPD defines the functional unit (FU) for clay brick, clay brick pavers, and structural clay tile products as 1 m² of product installed as per Table 2 of the PCR. Depending upon the application, other characteristics of clay masonry products should be considered when making comparisons. Fire rating, thermal properties, and acoustic performance may be important in characterizing the performance of clay masonry assemblies.

The clay masonry products listed below are baseline products. Results for all products can be found utilizing the conversion factor tables found in this EPD. Baseline products are listed in the conversion factor tables on the first line.

Name	Functional Unit Description	Mass of brick product in functional unit	Conversion of FU to 1 kilogram of the product
Clay Brick, Structural Clay Tile	1 m ² of vertically installed clay brick (or structural clay tile) using 0.95 cm (3/8") mortar joints for the estimated life of the building	130.61 kg per m ²	0.0077
Thin Brick	1 m ² of vertically installed thin brick using 0.95 cm (3/8") mortar joints for the estimated life of the building	23.29 kg per m ²	0.0083
Clay Brick Paver	1 m ² of horizontally installed clay brick paver using 3.2 mm (1/8") sand joints for the estimated life of the installed surface.	120.65 kg per m ²	0.0429

System Boundary

This is a Cradle-to-Grave Environmental Product Declaration. The following life cycle phases were considered:

Product Stage			Construction Process Stage		Use Stage							End of Life Stage*				Benefits and Loads Beyond the System Boundaries
Raw material supply	Transport	Manufacturing	Transport from gate to the site	Construction/ installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction /demolition	Transport	Waste processing	Disposal	Reuse-Recovery- Recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Description of the System Boundary Stages Corresponding to the PCR
(X = Included; MND = Module Not Declared)

Reference Service Life

The reference service life of a properly installed brick is 150 years. The building estimated service life is 75 years.

Environmental Product Declaration

Endicott Brick

Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Allocation

Allocation was determined on a per kilogram basis for primary data using the guidance of ISO 21930. Since the majority of energy is used in the firing of brick products, the inputs were allocated evenly over the fired brick weight production. Energy usage did not depend on brick specifications (such as pigment usage or shape) so the allocation over mass is not expected to introduce error. For secondary data, cut-off methodology was used.

Cut-off Criteria

Processes whose total contribution to the final result, with respect to their mass and in relation to all considered impact categories, is less than 1% can be neglected. The sum of the neglected processes may not exceed 5% by mass of the considered impact categories. For that a documented assumption is admissible.

For Hazardous Substances the following requirements apply:

- The Life Cycle Inventory (LCI) of hazardous substances will be included, if the inventory is available.
- If the LCI for a hazardous substance is not available, the substance will appear as an input in the LCI of the product, if its mass represents more than 0.1% of the product composition.
- If the LCI of a hazardous substance is approximated by modeling another substance, documentation will be provided.

This EPD is in compliance with the cut-off criteria. No processes were neglected or excluded. Capital items for the production processes (machine, buildings, etc.) were not taken into consideration.

Data Sources

Primary data were collected for every process in the product system under the control of Endicott. Secondary data from theecoinvent v3.11 and USLCI v2.0 databases were utilized. These data were evaluated and have temporal, geographic, and technical coverage appropriate to the scope of the brick product category.

Data Quality

The data sources used are complete and representative of the study's geographic and technological coverage and are a recent vintage. The data used for primary data are based on direct information sources of the manufacturer. Secondary data sets were used for raw materials extraction and processing, end of life, transportation, and energy production flows. Wherever secondary data is used, the study adopts critically reviewed data for consistency, precision, and reproducibility to limit uncertainty. The processes modeled represent the specific situations in the clay brick assembly life cycle. System boundaries and exclusions are clearly defined, and no other data gaps were identified.

Period Under Review

The period under review is the full calendar year of 2023.

Treatment of Biogenic Carbon

The uptake and release of biogenic carbon throughout the product life cycle follows ISO 21930 Section 7.2.7.

Environmental Product Declaration

Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Comparability and Benchmarking

EPDs are only comparable if they comply with ISO 21930, this sub-category PCR, include all relevant information modules and are based on equivalent scenarios with respect to the construction works context.

Environmental declarations from different programs may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building or construction works level, and therefore EPDs may not be used for comparability purposes when not considering the whole building life cycle. EPD comparability is only possible when all stages of the life cycle have been considered. However, variations and deviations are possible. Example of variations: Different LCA software and background datasets may lead to differences in the results upstream or downstream of the life cycle stages declared.

Units

The LCA results within this EPD are reported in SI units.

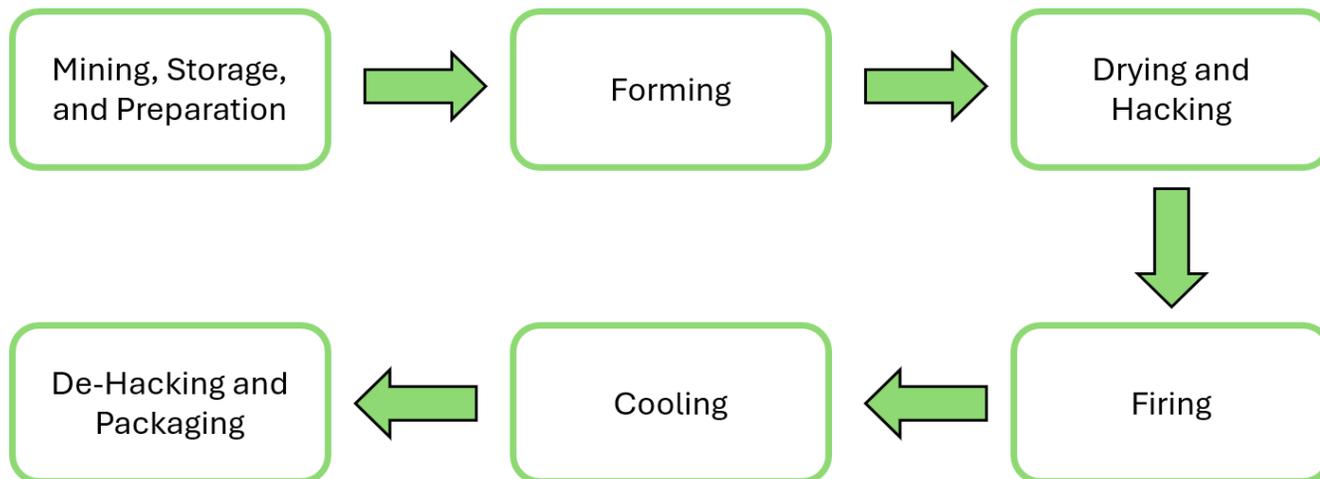
Additional Environmental Information

Background data

For life cycle modeling of the considered products, SimaPro by PRe Sustainability is used. The ecoinvent 3.11 and USLCI 2.0 databases contain consistent and documented datasets which can be found online. To ensure comparability of results in the LCA, the basic data of the SimaPro databases were used for energy, transportation and auxiliary materials.

Manufacturing

The brick manufacturing process follows the following general steps: 1). Mining, storage, and raw material preparation; 2). Forming; 3). Hacking and Drying; 4). Firing; 5). Cooling; 6). De-hacking and Packaging. The firing stage consumes the majority of energy required for brick production and can be powered by a variety of fuel sources. Depending on the facility, mining may occur on-site or the clay material may be transported from off-site.



Environmental Product Declaration

Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Packaging

Packaging is recyclable depending on material type and national statistics. The packaging material consists of cardboard, polypropylene, steel, and wood. Total mass of packaging per functional unit:

Clay Brick, Structural Clay Tile - 0.628 kg per functional unit

Clay Brick Paver - 0.58 kg per functional unit

Thin Brick - 0.112 kg per functional unit

Material	Quantity (% By Weight)
Plastic Straps	71.18%
Steel Straps	0.64%
Paper Dividers	10.51%
Wood Dividers	7.96%
Wood Pallets	9.70%
Total	100%

Transportation

Transport to Building Site (A4)				
Name	Structural Clay Brick	Clay Brick Paver	Thin Brick	Unit
Fuel type	Diesel	Diesel	Diesel	-
Liters of fuel (for freight (combination) truck with a 32t payload)	2.72E-03	2.72E-03	2.72E-03	L / 100km-kg
Vehicle Type	Combination Truck	Combination Truck	Combination Truck	-
Transport distance	407	407	407	km
Capacity utilization (including empty runs)	49.9	49.9	49.9	%
Gross density of products transported	1252.5	1670.0	1670.0	kg/m ³
Weight of products transported (if gross density not reported)	-			kg
Volume of products transported (if gross density not reported)	-			m ³
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	<1			-

Environmental Product Declaration

Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Product Installation

Products installed with mortar: Mortar creates a 3/8 inch (0.95 cm) wide joint between bricks in the square meter functional unit. Mixing energy was excluded from installation, per the PCR. For thin brick products, a 1/8 inch (0.32 cm) layer of bonding mortar is included on the bed side of the square meter.

Products installed with sand: A 1/8 inch (0.32 cm) wide joint was included between paver bricks. These joints are filled with sand, however, per the PCR, sand for this installation was excluded.

Installation into the building (A5)					
Name		Structural Clay Brick	Clay Brick Paver	Thin Brick	Unit
Auxiliary materials	Mortar	27.31	0.00	8.91	kg
	Water	5.46	0.00	1.78	kg
Water consumption		0.00	0.00	0.00	m ³
Electricity consumption		0.00	0.00	0.00	kWh
Product loss per functional unit		6.53	6.03	1.16	kg
Waste materials at construction site		28.93	26.73	5.16	kg
Output substance (recycle)		0.85	0.78	0.15	kg
Output substance (landfill)		5.68	5.25	1.01	kg
Output substance (incineration)		0.00	0.00	0.00	kg
Packaging waste (recycle)		8.3006	7.6680	1.4799	kg
Packaging waste (landfill)		7.8646	7.2653	1.4022	kg
Packaging waste (incineration)		6.2367	5.7615	1.1120	kg
Biogenic carbon contained in packaging		0.0098	0.0091	0.0017	kg
VOC emissions		-	-	-	kg

*CO₂ emissions to air from disposal of packaging

Environmental Product Declaration

Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Product Use

Once installed, clay masonry products last the life of a building, and they can be salvaged, reclaimed, or recycled for future construction after a building is demolished. The RSL for clay masonry established by this PCR is 150 years, but masonry products can and do last longer. While the impacts presented in this EPD are calculated for an ESL of 75 years, the cradle-to-grave impacts reported would be identical for a building life up to 150 years or more.

Maintenance of Clay Pavers was modeled per the PCR using water from a pressure washer (average 13hp) and a cleaning solution applied to the target area.

Reference Service Life		
Name	Value	Unit
Reference Service Life	150	years
Estimated Building Service Life	75	years
Number of Replacements	0.0	replacements

Maintenance Stage (B2)				
Name	Structural Clay Brick	Clay Brick Paver	Thin Brick	Unit
Maintenance cycle	0.0	37.5	0.0	Number/ RSL
Maintenance cycle	0.0	18.8	0.0	Number/ ESL
Water consumption (from tap, to sewer)	0.0	9.46E-03	0.0	m ³
Electricity consumption	0.0	0.0808	0.0	kWh
Ancillary materials	Cleaning agent	0.0	6.23E-02	kg/m ²
	Water	0.0	2.17E-01	kg/m ²

Disposal

Clay Brick, Clay Brick Pavers, and Structural Clay Tiles are collected separately from mixed construction waste in the demolition stage. Demolition and collection require no additional considerations from normal demolition; therefore, demolition impacts are de minimis. Upon collection, 12% of the product (by mass) is reused in the form of bulk aggregate to offset virgin material in other product life cycles, with the remaining 88% being landfilled.

End of life (C1-C4)				
Name	Structural Clay Brick	Clay Brick Paver	Thin Brick	Unit
Collected separately	130.61	120.65	23.29	kg
Collected as mixed construction waste	0.00	0.00	0.00	kg
Recycling	15.67	14.48	2.79	kg
Landfilling	114.93	106.18	20.49	kg
Incineration with energy recovery	0.00	0.00	0.00	kg

Environmental Product Declaration

Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Re-use Phase

Part of the product can be reused in construction outside of the current system boundary. Currently, there are companies that salvage brick and sell reclaimed brick to be used in new construction or in the repair of existing construction. However, due to limited data available on the number of reclaimed brick units that are reused, a value of 0% is assumed. Per the PCR, a value of 12% of brick are reused as aggregate gravel. The following table provides values on the extent of brick reused.

Re-Use, recovery, And/Or Recycling Potential (D)				
Name	Structural Clay Brick	Clay Brick Paver	Thin Brick	Unit
Scenario of benefits and loads after the system boundary	Brick product collected for reuse is used as construction aggregate. It is assumed to displace gravel on a kilogram per kilogram basis.			-
Aggregate gravel displaced from partial reuse of collected brick product.	15.67	14.48	2.79	kg

Environmental Product Declaration

Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Clay Brick, Structural Clay Tile - Results per Functional Unit Over the Building Lifetime of 75 Years

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks. Results reported below are for the Modular Clay Brick and Structural Clay Tile, the 2-1/4x4x8 INVISI-Lug Paver Clay Brick Paver, and the 2-1/4x8 Split Tile Thin Brick, which serve as the baseline products evaluated. Specification for the baseline products are identified in the Scaling Factor Tables for Clay Brick and Structural Clay Tile, Clay Brick Paver, and Thin Brick.

Results shown below were calculated using TRACI 2.2 Methodology.

TRACI 2.2 Impact Assessment										
Parameter	Parameter	Unit	A1-A3	A4	A5		B2	C2	C4	D
					Brick Impacts	Mortar Impacts				
GWP	Global warming	kg CO ₂ -Eq.	4.38E+01	4.93E+00	2.68E+00	8.25E+00	0.00E+00	1.58E+00	2.45E+00	-7.09E-02
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	3.00E-08	1.87E-10	4.01E-09	3.72E-08	0.00E+00	6.63E-11	4.94E-08	-7.30E-10
AP Air	Acidification potential for air emissions	kg SO ₂ -Eq.	4.24E-01	2.95E-02	2.44E-02	2.62E-02	0.00E+00	2.09E-02	1.36E-02	-4.30E-04
FEP	Freshwater eutrophication potential	kg P-Eq.	8.82E-04	5.57E-06	1.77E-04	8.50E-04	0.00E+00	1.98E-06	1.44E-04	-1.30E-05
MEP	Marine eutrophication potential	kg N-Eq.	1.80E-02	6.71E-03	1.73E-03	4.46E-03	0.00E+00	5.54E-03	3.17E-03	-8.30E-05
SP	Smog formation potential	kg O ₃ -Eq.	2.17E+00	8.06E-01	1.95E-01	5.02E-01	0.00E+00	5.37E-01	3.75E-01	-9.27E-03

*B1, B3, B4, B5, B6, B7, C1, and C3 are included in this study and have values of zero in all impact categories.

The additional results shown below were calculated using the CML 4.1 (2001 - April 2013) Methodology.

Parameter	Parameter	Unit	A1-A3	A4	A5		B2	C2	C4	D
					Brick Impacts	Mortar Impacts				
ADPF	Abiotic depletion potential for fossil resources	MJ	5.82E+02	6.34E+01	3.36E+01	2.17E+01	0.00E+00	2.27E+01	3.25E+00	-3.06E-01

*B1, B3, B4, B5, B6, B7, C1, and C3 are included in this study and have values of zero in all impact categories.

Environmental Product Declaration

Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Statement on EPD results

A) Results in the above tables for modules A1-A3 and A4 reflect the manufacture and transportation to the job site of the clay masonry product only. Beginning with module A5 installation, the remaining columns reflect the impacts of the masonry product within the construction works, and thus consider the presence of mortar, etc.

B) Results in the impact tables reflect the life cycle impacts associated with the baseline product only. Impacts for other products in the EPD can be determined using a conversion factor. To determine the results for another product simply multiply the impacts for the baseline product by the appropriate conversion factor as follows:

- 1) Where applicable, multiply the results from the mortar column (under A5) by the mortar conversion factor.
- 2) Multiply all non-mortar column results by the applicable clay masonry product conversion factor for that product

Results below contain the resource use throughout the life cycle of the product.

Resource Use										
Parameter	Parameter	Unit	A1-A3	A4	A5		B2	C2	C4	D
					Brick Impacts	Mortar Impacts				
RPR _E	Renewable primary energy as energy carrier	MJ	3.30E+00	0.00E+00	1.90E-01	6.74E+00	0.00E+00	0.00E+00	4.87E-01	-7.18E-02
RPR _M	Renewable primary energy resources as material utilization	MJ	4.1E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRPR _E	Nonrenewable primary energy as energy carrier	MJ	5.85E+02	6.34E+01	3.38E+01	2.42E+01	0.00E+00	2.27E+01	3.75E+00	-3.85E-01
NRPR _M	Nonrenewable primary energy as material utilization	MJ	9.04E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SM	Use of secondary material	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	Use of renewable secondary fuels	MJ	5.49E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	Use of nonrenewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE	Energy recovered from disposed waste	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	Use of net fresh water	m ³	4.60E-02	0.00E+00	3.15E-03	4.44E-02	0.00E+00	0.00E+00	2.10E-02	-2.38E-02

*B1, B3, B4, B5, B6, B7, C1, and C3 are included in this study and have values of zero in all impact categories.

Environmental Product Declaration

Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories										
Parameter	Parameter	Unit	A1-A3	A4	A5		B2	C2	C4	D
					Brick Impacts	Mortar Impacts				
HWD	Hazardous waste disposed	kg	1.26E-04	0.00E+00	2.04E-05	2.18E-04	0.00E+00	0.00E+00	2.77E-04	-4.61E-06
NHWD	Non-hazardous waste disposed	kg	6.45E-01	0.00E+00	5.84E+00	9.57E-01	0.00E+00	0.00E+00	1.15E+02	-8.15E-03
HLRW	High-level radioactive waste	kg or m ³	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ILLRW	Intermediate- and low-level radioactive waste	kg or m ³	5.70E-05	0.00E+00	3.22E-06	3.75E-05	0.00E+00	0.00E+00	7.15E-06	-1.19E-06
CRU	Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	Materials for recycling	kg	0.00E+00	0.00E+00	9.15E+00	0.00E+00	0.00E+00	0.00E+00	1.57E+01	0.00E+00
MER	Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	Recovered energy exported from system	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

*B1, B3, B4, B5, B6, B7, C1, and C3 are included in this study and have values of zero in all impact categories.

Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use										
Parameter	Parameter	Unit	A1-A3	A4	A5		B2	C2	C4	D
					Brick Impacts	Mortar Impacts				
BCRP	Biogenic Carbon Removal from Product	kg CO ₂	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCEP	Biogenic Carbon Emissions from Product	kg CO ₂	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCRK	Biogenic Carbon Removal from Packaging	kg CO ₂	4.14E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO ₂	0.00E+00	0.00E+00	4.14E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO ₂	2.24E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CCE	Calcination Carbon Emissions	kg CO ₂	5.95E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CCR	Carbonation Carbon Removal	kg CO ₂	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO ₂	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

*B1, B3, B4, B5, B6, B7, C1, and C3 are included in this study and have values of zero in all impact categories.

Environmental Product Declaration

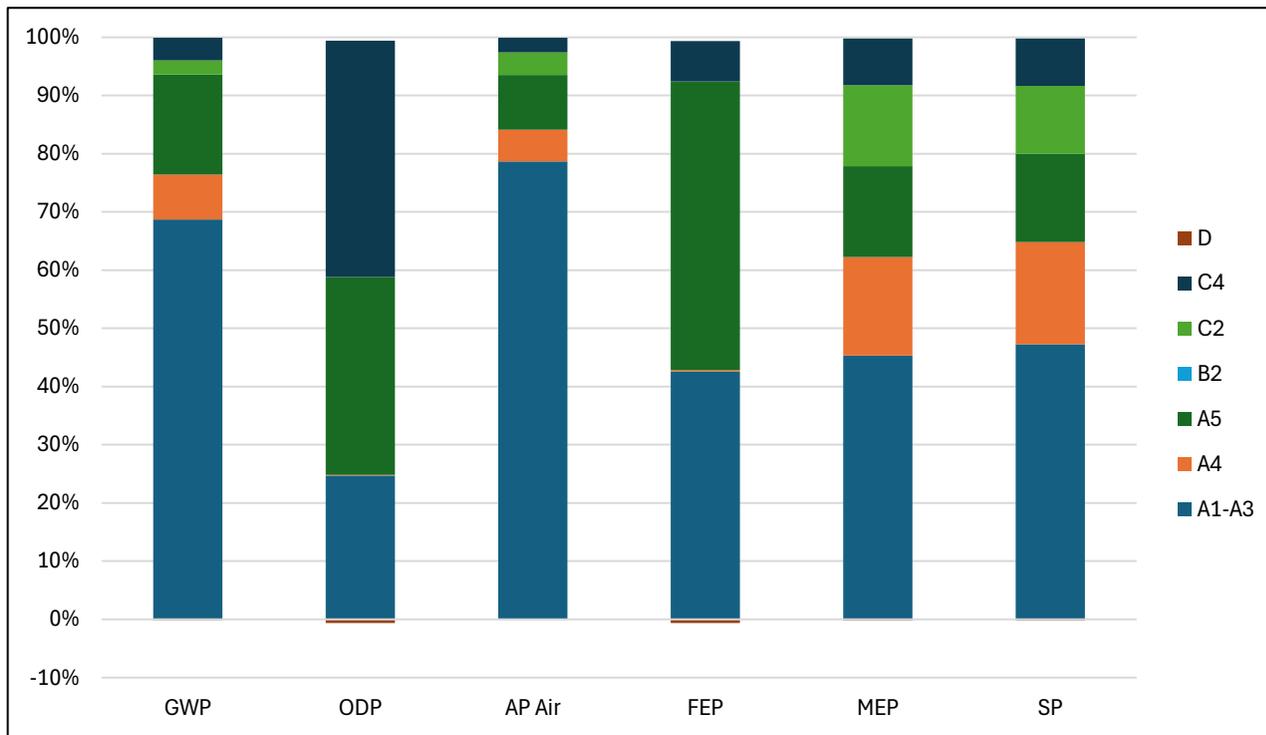
Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Clay Brick, Structural Clay Tile - LCA Interpretation

The production life cycle stage (A1-A3) dominates the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity and natural gas use in the manufacturing of the product. Downstream stages are effected by the weight of the product, except for the mortar used in installation.



Environmental Product Declaration

Endicott Brick

Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Clay Brick, Structural Clay Tile - Conversion Factors for Results

The following table can be used to scale the impacts given above to any of the products listed below by using the appropriate factors. To calculate an impact for a given product, multiply the impact by that products conversion factor. For impacts in the 'A5 - Mortar Impacts' column, use the 'Mortar Conversion Factor' below. Otherwise, use the 'Brick Conversion Factor' column.

For example: To determine the A1-A3 TRACI GWP impact for 'Norman', multiply the above impact (4.38E+01) by the Brick Conversion Factor (0.974) for a result of 4.27E+01.

To determine impact over the entire lifecycle, multiply the impact for each stage by the correct conversion factor and summate.

Unit Size Designation	ASTM Specification	Dimensions (inch) (W x H x L)	Dimensions (cm) (W x H x L)	Void Space (%)	Mass of Masonry unit (kg/unit)	No. of Units/m ² (0.95 cm joint)	Brick Conversion Factor	Mortar Mass (kg/m ²)	Mortar Conversion Factor
Modular (Baseline)	C216	3.625 x 2.25 x 7.625	9.2 x 5.7 x 19.4	25.0%	1.77	73.81	1.000	32.77	---
Norman	C216	3.625 x 2.25 x 11.625	9.2 x 5.7 x 29.5	25.0%	2.59	49.21	0.974	30.37	0.927
Utility	C216	3.625 x 3.625 x 11.625	9.2 x 9.2 x 29.5	25.0%	4.13	32.29	1.021	21.85	0.667
Kingsize	C216	3 x 2.625 x 9.625	7.6 x 6.7 x 24.4	25.0%	2.13	51.67	0.844	23.38	0.714
Slim King	C216	2.625 x 2.625 x 9.625	6.7 x 6.7 x 24.4	25.0%	2.00	51.67	0.790	20.46	0.624
3" Utility	C216	3 x 3.625 x 11.625	7.6 x 9.2 x 29.5	25.0%	3.45	32.29	0.853	18.09	0.552
Norwegian (Eng Norm)	C216	3.625 x 2.813 x 11.625	9.2 x 7.1 x 29.5	25.0%	3.18	40.52	0.985	26.00	0.793
Closure	C216	3.625 x 3.625 x 7.625	9.2 x 9.2 x 19.4	25.0%	2.81	48.44	1.043	24.39	0.744
Roman	C216	3.625 x 1.625 x 11.625	9.2 x 4.1 x 29.5	25.0%	2.00	64.58	0.987	38.11	1.163
Triple Brick	C216	3.625 x 7.625 x 7.625	9.2 x 19.4 x 19.4	25.0%	5.90	24.22	1.094	16.39	0.500
Meridian	C216	3.625 x 3.625 x 15.625	9.2 x 9.2 x 39.7	25.0%	5.90	24.22	1.094	20.59	0.628
2-1/4" Meridian	C216	3.625 x 2.25 x 15.625	9.2 x 5.7 x 39.7	25.0%	3.27	36.90	0.923	29.17	0.890
6" Thru-the-Wall	C652	5.625 x 3.625 x 11.625	14.3 x 9.2 x 29.5	35.0%	5.90	32.29	1.458	33.91	1.035
8" Thru-the-Wall	C652	7.625 x 3.625 x 11.625	19.4 x 9.2 x 29.5	34.5%	7.71	32.29	1.907	45.97	1.403
Engineer Modular (Jumbo)	C216	3.625 x 2.813 x 7.625	9.2 x 7.1 x 19.4	25.0%	2.27	60.78	1.056	28.47	0.869
Engineer Kingsize	C216	3 x 2.813 x 9.625	7.6 x 7.1 x 24.4	25.0%	2.72	48.63	1.014	22.33	0.682
Other	C216	3.625 x 2.594 x 9.625	9.2 x 6.6 x 24.4	25.0%	2.56	52.21	1.025	28.48	0.869

Environmental Product Declaration

Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

The following photo shows a depiction of a Clay Brick.



Clay Brick Paver - Results per Functional Unit Over the Building Lifetime of 75 Years

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

Results shown below were calculated using TRACI 2.2 Methodology.

TRACI 2.2 Impact Assessment									
Parameter	Parameter	Unit	A1-A3	A4	A5	B2	C2	C4	D
GWP	Global warming	kg CO ₂ -Eq.	4.05E+01	4.56E+00	2.48E+00	1.63E+00	1.46E+00	2.26E+00	-6.55E-02
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	2.77E-08	1.72E-10	3.71E-09	1.54E-07	6.13E-11	4.56E-08	-6.74E-10
AP Air	Acidification potential for air emissions	kg SO ₂ -Eq.	3.92E-01	2.72E-02	2.26E-02	1.07E-02	1.93E-02	1.26E-02	-3.98E-04
FEP	Freshwater eutrophication potential	kg P-Eq.	8.15E-04	5.14E-06	1.63E-04	2.94E-04	1.83E-06	1.33E-04	-1.20E-05
MEP	Marine eutrophication potential	kg N-Eq.	1.66E-02	6.20E-03	1.60E-03	1.89E-03	5.12E-03	2.93E-03	-7.67E-05
SP	Smog formation potential	kg O ₃ -Eq.	2.01E+00	7.45E-01	1.80E-01	2.36E-01	4.96E-01	3.46E-01	-8.56E-03

*B1, B3, B4, B5, B6, B7, C1, and C3 are included in this study and have values of zero in all impact categories.

The additional results shown below were calculated using the CML 4.1 (2001 - April 2013) Methodology.

Parameter	Parameter	Unit	A1-A3	A4	A5	B2	C2	C4	D
ADPF	Abiotic depletion potential for fossil resources	MJ	5.37E+02	5.86E+01	3.10E+01	1.31E+01	2.10E+01	3.00E+00	-2.82E-01

*B1, B3, B4, B5, B6, B7, C1, and C3 are included in this study and have values of zero in all impact categories.

Environmental Product Declaration

Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Results below contain the resource use throughout the life cycle of the product.

Resource Use									
Parameter	Parameter	Unit	A1-A3	A4	A5	B2	C2	C4	D
RPR _E	Renewable primary energy as energy carrier	MJ	3.04E+00	0.00E+00	1.75E-01	1.51E+00	0.00E+00	4.50E-01	-6.63E-02
RPR _M	Renewable primary energy resources as material utilization	MJ	3.76E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRPR _E	Nonrenewable primary energy as energy carrier	MJ	5.41E+02	5.86E+01	3.12E+01	1.46E+01	2.10E+01	3.46E+00	-3.55E-01
NRPR _M	Nonrenewable primary energy as material utilization	MJ	8.35E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SM	Use of secondary material	kg	0.00E+00						
RSF	Use of renewable secondary fuels	MJ	5.07E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	Use of nonrenewable secondary fuels	MJ	0.00E+00						
RE	Energy recovered from disposed waste	MJ	0.00E+00						
FW	Use of net fresh water	m ³	4.25E-02	0.00E+00	2.91E-03	1.83E-01	0.00E+00	1.94E-02	-2.20E-02

*B1, B3, B4, B5, B6, B7, C1, and C3 are included in this study and have values of zero in all impact categories.

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories									
Parameter	Parameter	Unit	A1-A3	A4	A5	B2	C2	C4	D
HWD	Hazardous waste disposed	kg	1.16E-04	0.00E+00	1.88E-05	4.47E-04	0.00E+00	2.56E-04	-4.26E-06
NHWD	Non-hazardous waste disposed	kg	5.96E-01	0.00E+00	5.39E+00	9.77E-02	0.00E+00	1.06E+02	-7.53E-03
HLRW	High-level radioactive waste	kg or m ³	0.00E+00						
ILLRW	Intermediate- and low-level radioactive waste	kg or m ³	5.26E-05	0.00E+00	2.97E-06	2.33E-05	0.00E+00	6.60E-06	-1.10E-06
CRU	Components for re-use	kg	0.00E+00						
MR	Materials for recycling	kg	0.00E+00	0.00E+00	8.45E+00	0.00E+00	0.00E+00	1.45E+01	0.00E+00
MER	Materials for energy recovery	kg	0.00E+00						
EE	Recovered energy exported from system	MJ	0.00E+00						

*B1, B3, B4, B5, B6, B7, C1, and C3 are included in this study and have values of zero in all impact categories.

Environmental Product Declaration

Endicott Brick

Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

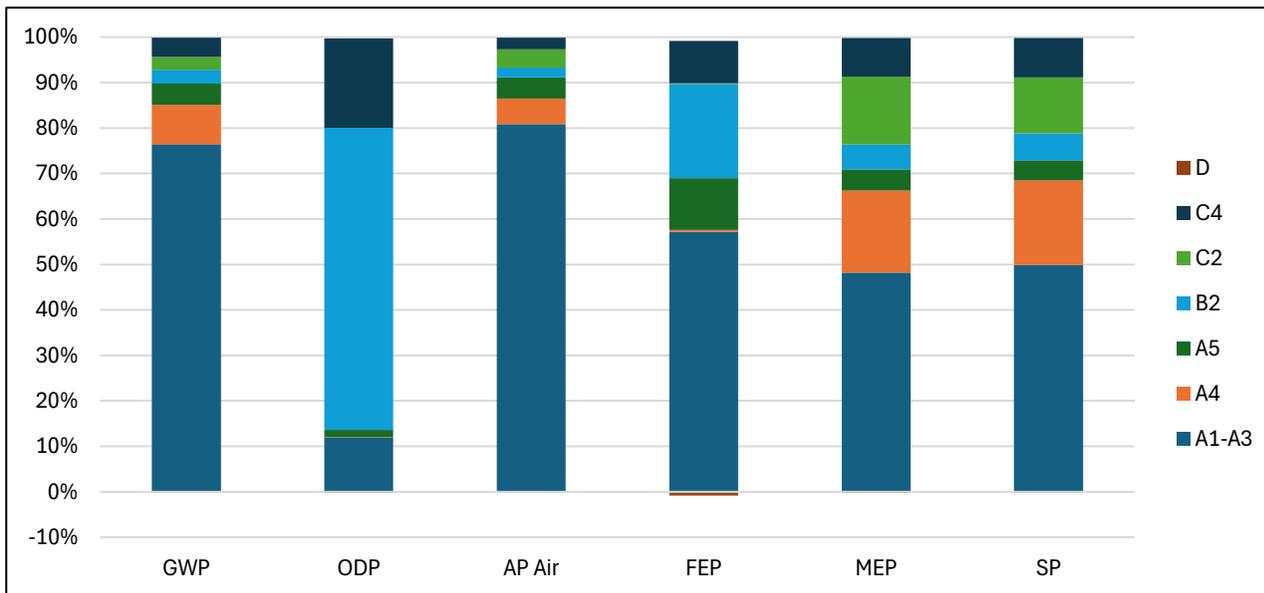
Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the

Resource Use									
Parameter	Parameter	Unit	A1-A3	A4	A5	B2	C2	C4	D
BCRP	Biogenic Carbon Removal from Product	kg CO ₂	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0E+00	0.0E+00	0.0E+00
BCEP	Biogenic Carbon Emissions from Product	kg CO ₂	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.0E+00	0.0E+00	0.0E+00
BCRK	Biogenic Carbon Removal from Packaging	kg CO ₂	3.83E-01	0.0E+00	0.0E+00	0.00E+00	0.0E+00	0.0E+00	0.0E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO ₂	0.0E+00	0.0E+00	3.8E-01	0.00E+00	0.0E+00	0.0E+00	0.0E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO ₂	2.07E-04	0.0E+00	0.0E+00	0.00E+00	0.0E+00	0.0E+00	0.0E+00
CCE	Calcination Carbon Emissions	kg CO ₂	5.5E+00	0.0E+00	0.0E+00	0.00E+00	0.0E+00	0.0E+00	0.0E+00
CCR	Carbonation Carbon Removal	kg CO ₂	0.00E+00	0.0E+00	0.0E+00	0.00E+00	0.0E+00	0.0E+00	0.0E+00
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO ₂	0.00E+00	0.0E+00	0.0E+00	0.00E+00	0.0E+00	0.0E+00	0.0E+00

*B1, B3, B4, B5, B6, B7, C1, and C3 are included in this study and have values of zero in all impact categories.

Clay Brick Paver - LCA Interpretation

The production life cycle stage (A1-A3) dominates the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity and natural gas use in the manufacturing of the product. Downstream stages are effected by the weight of the product, except for the washing required in the use stage.



Environmental Product Declaration

Endicott Brick

Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Clay Brick Paver - Scaling Factors for Results

The following table can be used to scale the impacts given above to any of the products listed below by using the appropriate factors. To calculate an impact for a given product, multiply the impact by that product's 'Brick Conversion Factor'.

For example: To determine the A1-A3 TRACI GWP impact for '2-1/4x4x8 R/L Paver', multiply the above impact (4.05E+01) by the Brick Conversion Factor (1.000) for a result of 4.05E+01.

To determine impact over the entire lifecycle, multiply the impact for each stage by the correct conversion factor and summate.

Paver Designation	ASTM Specification	Dimensions (inch) (W x H x L)	Dimensions (cm) (W x H x L)	Void Space (%)	Mass of Paver (kg/unit)	No. of Units/m ² (0.32 cm joint)	Paver Conversion Factor
2-1/4x4x8 INVISI-Lug Paver (Baseline)	C902	4 x 2.25 x 8	10.2 x 5.7 x 20.3	0.0%	2.61	46.25	---
2-1/4x4x8 R/L Paver	C902	4 x 2.25 x 8	10.2 x 5.7 x 20.3	0.0%	2.61	46.25	1.000
2-1/4x4x8 Permeable	C902	4 x 2.25 x 8	10.2 x 5.7 x 20.3	10.0%	2.61	46.25	1.000
2-1/4x3-5/8x11-5/8 Paver	C902	3.625 x 2.25 x 11.625	9.2 x 5.7 x 29.5	0.0%	3.40	35.18	0.992
2-1/4x4x12 INVISI-Lug	C902	4 x 2.25 x 12	10.2 x 5.7 x 30.5	0.0%	3.92	30.99	1.008
2-1/4x4x12 R/L Paver	C902	4 x 2.25 x 12	10.2 x 5.7 x 30.5	0.0%	3.92	30.99	1.008
2-1/4x8x8 INVISI-Lug	C902	8 x 2.25 x 8	20.3 x 5.7 x 20.3	0.0%	5.56	23.48	1.082
2-1/4x8x8 R/L Paver	C902	8 x 2.25 x 8	20.3 x 5.7 x 20.3	0.0%	5.56	23.48	1.082
2-1/4x8x8 Paver	C902	8 x 2.25 x 8	20.3 x 5.7 x 20.3	0.0%	5.56	23.48	1.082
2-5/8x4x8 INVISI-Lug Paver	C1272	4 x 2.625 x 8	10.2 x 6.7 x 20.3	0.0%	3.04	46.25	1.165
2-5/8x4x8 R/L	C1272	4 x 2.875 x 8	10.2 x 7.3 x 20.3	0.0%	3.27	46.25	1.252
2-5/8x4x8 Permeable	C1272	4 x 2.875 x 8	10.2 x 7.3 x 20.3	10.0%	3.27	46.25	1.252
2-1/4x3-5/8x7-5/8 ADA Paver	C902	3.625 x 2.45 x 7.625	9.2 x 6.2 x 19.4	0.0%	2.27	53.33	1.003
2-1/4x4x8 ADA Paver	C902	4 x 2.45 x 8	10.2 x 6.2 x 20.3	0.0%	2.61	46.25	1.000
Paver Tread 8"	C902	3.625 x 2.25 x 7.625	9.2 x 5.7 x 19.4	0.0%	2.27	53.33	1.003
Paver Tread 12"	C902	3.625 x 2.25 x 11.625	9.2 x 5.7 x 29.5	0.0%	3.31	35.18	0.966
1-1/4x3-5/8x7-5/8 Paver	C902	3.625 x 1.25 x 7.625	9.2 x 3.2 x 19.4	0.0%	1.27	53.33	0.562
1-1/4x4x8 Paver	C902	4 x 1.25 x 8	10.2 x 3.2 x 20.3	0.0%	1.27	46.25	0.487
2-1/4x3-5/8x7-5/8 Paver	C902	3.625 x 2.25 x 7.625	9.2 x 5.7 x 19.4	0.0%	2.27	53.33	1.003

Environmental Product Declaration

Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

The following photo shows a depiction of a Clay Brick Paver.



Thin Brick - Results per Functional Unit Over the Building Lifetime of 75 Years

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

Results shown below were calculated using TRACI 2.2 Methodology.

TRACI 2.2 Impact Assessment										
Parameter	Parameter	Unit	A1-A3	A4	A5		B2	C2	C4	D
					Brick Impacts	Mortar Impacts				
GWP	Global warming	kg CO ₂ -Eq.	7.81E+00	8.79E-01	4.78E-01	2.69E+00	0.00E+00	2.82E-01	4.36E-01	-1.26E-02
ODP	Depletion potential of the stratospheric ozone layer	kg CFC-11 Eq.	5.35E-09	3.33E-11	7.16E-10	1.21E-08	0.00E+00	1.18E-11	8.80E-09	-1.30E-10
AP Air	Acidification potential for air emissions	kg SO ₂ -Eq.	7.56E-02	5.25E-03	4.35E-03	8.54E-03	0.00E+00	3.73E-03	2.42E-03	-7.67E-05
FEP	Freshwater eutrophication potential	kg P-Eq.	1.57E-04	9.93E-07	3.15E-05	2.77E-04	0.00E+00	3.53E-07	2.57E-05	-2.33E-06
MEP	Marine eutrophication potential	kg N-Eq.	3.20E-03	1.20E-03	3.09E-04	1.46E-03	0.00E+00	9.87E-04	5.66E-04	-1.48E-05
SP	Smog formation potential	kg O ₃ -Eq.	3.87E-01	1.44E-01	3.48E-02	1.64E-01	0.00E+00	9.57E-02	6.68E-02	-1.65E-03

*B1, B3, B4, B5, B6, B7, C1, and C3 are included in this study and have values of zero in all impact categories.

The additional results shown below were calculated using the CML 4.1 (2001 - April 2013) Methodology.

Parameter	Parameter	Unit	A1-A3	A4	A5		B2	C2	C4	D
					Brick Impacts	Mortar Impacts				
ADPF	Abiotic depletion potential for fossil resources	MJ	1.04E+02	1.13E+01	5.98E+00	7.07E+00	0.00E+00	4.05E+00	5.79E-01	-5.45E-02

*B1, B3, B4, B5, B6, B7, C1, and C3 are included in this study and have values of zero in all impact categories.

Environmental Product Declaration

Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Results below contain the resource use throughout the life cycle of the product.

Resource Use										
Parameter	Parameter	Unit	A1-A3	A4	A5		B2	C2	C4	D
					Brick Impacts	Mortar Impacts				
RPR _E	Renewable primary energy as energy carrier	MJ	5.88E-01	0.00E+00	3.38E-02	2.20E+00	0.00E+00	0.00E+00	8.68E-02	-1.28E-02
RPR _M	Renewable primary energy resources as material utilization	MJ	7.25E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRPR _E	Nonrenewable primary energy as energy carrier	MJ	1.04E+02	1.13E+01	6.02E+00	7.88E+00	0.00E+00	4.05E+00	6.68E-01	-6.86E-02
NRPR _M	Nonrenewable primary energy as material utilization	MJ	1.61E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SM	Use of secondary material	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	Use of renewable secondary fuels	MJ	9.79E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	Use of nonrenewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RE	Energy recovered from disposed waste	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	Use of net fresh water	m ³	8.20E-03	0.00E+00	5.62E-04	1.45E-02	0.00E+00	0.00E+00	3.75E-03	-4.25E-03

*B1, B3, B4, B5, B6, B7, C1, and C3 are included in this study and have values of zero in all impact categories.

Results below contain the output flows and wastes throughout the life cycle of the product.

Output Flows and Waste Categories										
Parameter	Parameter	Unit	A1-A3	A4	A5		B2	C2	C4	D
					Brick Impacts	Mortar Impacts				
HWD	Hazardous waste disposed	kg	2.25E-05	0.00E+00	3.63E-06	7.12E-05	0.00E+00	0.00E+00	4.94E-05	-8.22E-07
NHWD	Non-hazardous waste disposed	kg	1.15E-01	0.00E+00	1.04E+00	3.12E-01	0.00E+00	0.00E+00	2.05E+01	-1.45E-03
HLRW	High-level radioactive waste	kg or m ³	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ILLRW	Intermediate- and low-level radioactive waste	kg or m ³	1.02E-05	0.00E+00	5.73E-07	1.22E-05	0.00E+00	0.00E+00	1.27E-06	-2.13E-07
CRU	Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	Materials for recycling	kg	0.00E+00	0.00E+00	1.63E+00	0.00E+00	0.00E+00	0.00E+00	2.79E+00	0.00E+00
MER	Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	Recovered energy exported from system	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

*B1, B3, B4, B5, B6, B7, C1, and C3 are included in this study and have values of zero in all impact categories.

Environmental Product Declaration

Endicott Brick

Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

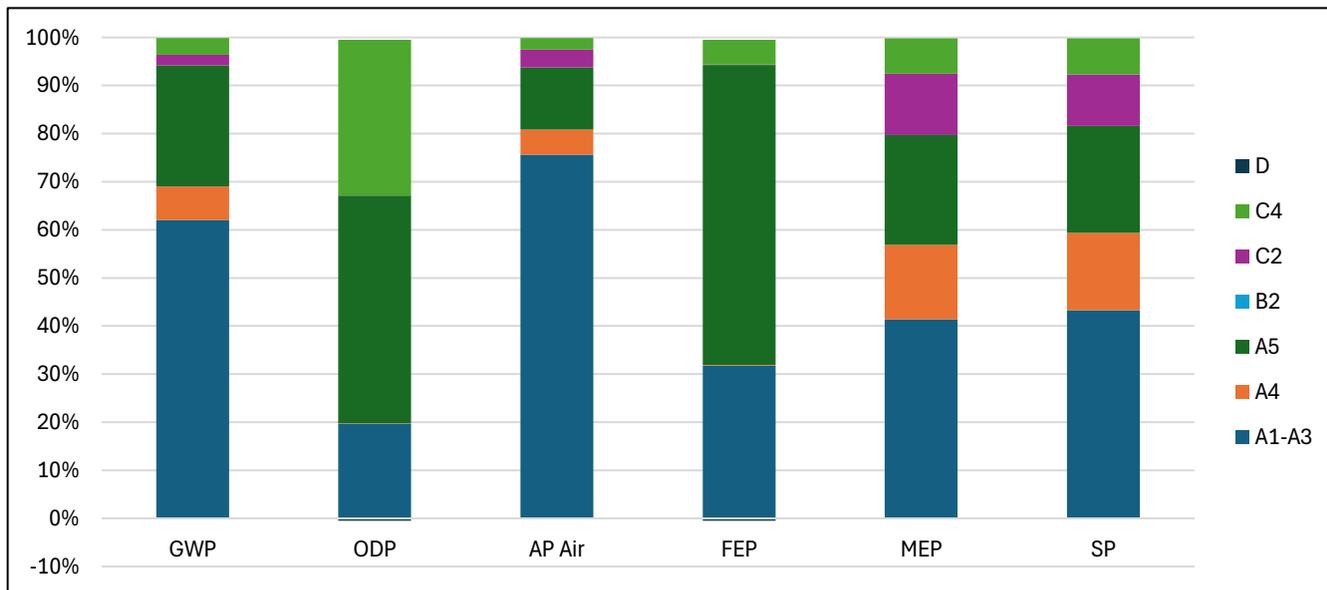
Results below contain direct greenhouse gas emissions and removals throughout the life cycle of the product.

Resource Use										
Parameter	Parameter	Unit	A1-A3	A4	A5		B2	C2	C4	D
					Brick Impacts	Mortar Impacts				
BCRP	Biogenic Carbon Removal from Product	kg CO ₂	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCEP	Biogenic Carbon Emissions from Product	kg CO ₂	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCRK	Biogenic Carbon Removal from Packaging	kg CO ₂	7.39E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCEK	Biogenic Carbon Emissions from Packaging	kg CO ₂	0.00E+00	0.00E+00	7.39E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BCEW	Biogenic Carbon Emissions from Combustion of Waste from Renewable Sources Used in Production Process	kg CO ₂	3.99E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CCE	Calcination Carbon Emissions	kg CO ₂	1.06E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CCR	Carbonation Carbon Removal	kg CO ₂	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CWNR	Carbon Emissions from Combustion of Waste from Non-renewable Sources Used in Production Process	kg CO ₂	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

*B1, B3, B4, B5, B6, B7, C1, and C3 are included in this study and have values of zero in all impact categories.

Thin Brick - LCA Interpretation

The production life cycle stage (A1-A3) dominates the impacts across all impact categories. This is due to the upstream production of materials used in the product, along with electricity and natural gas use in the manufacturing of the product. Downstream stages are effected by the weight of the product, except for the mortar used in installation.



Environmental Product Declaration

Endicott Brick

Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Thin Brick - Scaling Factors for Results

The following table can be used to scale the impacts given above to any of the products listed below by using the appropriate factors. To calculate an impact for a given product, multiply the impact by that products conversion factor. For impacts in the 'A5 - Mortar Impacts' column, use the 'Mortar Conversion Factor' below. Otherwise, use the 'Brick Conversion Factor' column.

For example: To determine the A1-A3 TRACI GWP impact for '2-1/4x8 Split Tile', multiply the above impact (7.81E+00) by the Brick Conversion Factor (1.000) for a result of 7.81E+00.

To determine impact over the entire lifecycle, multiply the impact for each stage by the correct conversion factor and summate.

Unit Size Designation	ASTM Specification	Dimensions (inch) (W x H x L)	Dimensions (cm) (W x H x L)	Mass of Thin Brick (kg/unit)	No. of Units/m ² (0.95 cm joint)	Thin Brick Conversion Factor	Mortar Mass (kg/m ²)	Mortar Conversion Factor
2-1/4x8 Split Tile (Baseline)	C1088	0.5 x 2.25 x 7.625	1.3 x 5.7 x 19.4	0.32	73.81	1.000	10.693	---
2-1/4x8 Split Tile	C1088	0.5 x 2.25 x 7.625	1.3 x 5.7 x 19.4	0.32	73.81	1.000	10.693	1.000
5/8"x2-1/4x7-5/8	C1088	0.625 x 2.25 x 7.625	1.6 x 5.7 x 19.4	0.37	73.81	1.184	11.823	1.106
1"x2-1/4x7-5/8	C1088	1 x 2.25 x 7.625	2.5 x 5.7 x 19.4	0.68	73.81	2.157	15.213	1.423
4x8 Split Tile	C1088	0.5 x 3.625 x 7.625	1.3 x 9.2 x 19.4	0.53	48.44	1.103	9.538	0.892
5/8"x3-5/8x7-5/8	C1088	0.625 x 3.625 x 7.625	1.6 x 9.2 x 19.4	0.60	48.44	1.258	10.379	0.971
1"x3-5/8x7-5/8	C1088	1 x 3.625 x 7.625	2.5 x 9.2 x 19.4	0.95	48.44	1.982	12.902	1.207
1/2x2-5/8x9-5/8	C1088	0.5 x 2.625 x 9.625	1.3 x 6.7 x 24.4	0.45	51.67	1.007	10.070	0.942
5/8"x2-5/8x9-5/8	C1088	0.625 x 2.625 x 9.625	1.6 x 6.7 x 24.4	0.58	51.67	1.279	11.045	1.033
1"x2-5/8x9-5/8	C1088	1 x 2.625 x 9.625	2.5 x 6.7 x 24.4	0.93	51.67	2.055	13.967	1.306
2-1/4 x 12 Split Tile	C1088	0.5 x 2.25 x 11.625	1.3 x 5.7 x 29.5	0.46	49.21	0.965	10.363	0.969
5/8"x2-1/4x11-5/8	C1088	0.625 x 2.25 x 11.625	1.6 x 5.7 x 29.5	0.56	49.21	1.175	11.410	1.067
1"x2-1/4x11-5/8	C1088	1 x 2.25 x 11.625	2.5 x 5.7 x 29.5	0.89	49.21	1.888	14.552	1.361
4x12 Split Tile	C1088	0.5 x 3.625 x 11.625	1.3 x 9.2 x 29.5	0.72	32.29	0.996	9.188	0.859
5/8"x3-5/8x11-5/8	C1088	0.625 x 3.625 x 11.625	1.6 x 9.2 x 29.5	0.92	32.29	1.279	9.941	0.930
1"x3-5/8x11-5/8	C1088	1 x 3.625 x 11.625	2.5 x 9.2 x 29.5	1.36	32.29	1.888	12.202	1.141
1-5/8x12	C1088	0.5 x 1.625 x 11.625	1.3 x 4.1 x 29.5	0.35	64.58	0.982	11.431	1.069
5/8" 1-5/8" x12 KB TB	C1088	0.625 x 1.625 x 11.625	1.6 x 4.1 x 29.5	0.41	64.58	1.145	12.745	1.192
1"x 1-5/8x12 TB	C1088	1 x 1.625 x 11.625	2.5 x 4.1 x 29.5	0.69	64.58	1.909	16.688	1.561
8x8 Split Tile	C1088	0.5 x 7.625 x 7.625	1.3 x 19.4 x 19.4	1.08	24.22	1.120	8.434	0.789
1"x 2-1/4x16 Thin Brk	C1088	1 x 2.25 x 15.625	2.5 x 5.7 x 39.7	1.36	36.90	2.157	14.221	1.330
1"x4x16 KB Thin Brk	C1088	1 x 3.625 x 15.625	2.5 x 9.2 x 39.7	1.93	24.22	2.005	11.853	1.108

Environmental Product Declaration

Endicott Brick

Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Unit Size Designation	ASTM Specification	Dimensions (inch) (W x H x L)	Dimensions (cm) (W x H x L)	Mass of Thin Brick (kg/unit)	No. of Units/m ² (0.95 cm joint)	Thin Brick Conversion Factor	Mortar Mass (kg/m ²)	Mortar Conversion Factor
BC 2-1/4 48 Brick Corner	C1088	0.5 x 2.25 x 11.25	1.3 x 5.7 x 28.6	0.50	50.79	1.089	10.384	0.971
BC2-5/8 310	C1088	0.5 x 2.625 x 12.625	1.3 x 6.7 x 32.1	0.66	39.74	1.123	9.883	0.924
BC 448 Brick Corner	C1088	0.5 x 3.625 x 11.25	1.3 x 9.2 x 28.6	0.82	33.33	1.169	9.210	0.861
BC 1-5/8 48 TK3	C1088	0.5 x 1.625 x 11.25	1.3 x 4.1 x 28.6	0.36	66.67	1.039	11.451	1.071
BC 848	C1088	0.5 x 7.625 x 11.25	1.3 x 19.4 x 28.6	1.72	16.67	1.234	8.090	0.757
5/8" BC 2-1/4 48	C1088	0.625 x 2.25 x 12.25	1.6 x 5.7 x 31.1	0.64	46.77	1.276	11.369	1.063
5/8" BC 2-5/8 310	C1088	0.625 x 2.625 x 12.625	1.6 x 6.7 x 32.1	0.82	39.74	1.394	10.811	1.011
5/8" BC 448	C1088	0.625 x 3.625 x 11.25	1.6 x 9.2 x 28.6	1.04	33.33	1.494	9.970	0.932
5/8" BC 1-5/8 48	C1088	0.625 x 1.625 x 11.25	1.6 x 4.1 x 28.6	0.45	66.67	1.299	12.770	1.194
1" BC2-1/4 48	C1088	1 x 2.25 x 11.25	2.5 x 5.7 x 28.6	0.79	50.79	1.732	14.594	1.365
1" BC 2-5/8 310	C1088	1 x 2.625 x 12.625	2.5 x 6.7 x 32.1	1.02	39.74	1.742	13.594	1.271
1" BC 448	C1088	1 x 3.625 x 11.25	2.5 x 9.2 x 28.6	1.36	33.33	1.948	12.247	1.145
1" BC 1-5/8 48	C1088	1 x 1.625 x 11.25	2.5 x 4.1 x 28.6	0.59	66.67	1.689	16.728	1.564

The following photo shows a depiction of a Thin Brick.



Statement on EPD results

A) Results in the above tables for modules A1-A3 and A4 reflect the manufacture and transportation to the job site of the clay masonry product only. Beginning with module A5 installation, the remaining columns reflect the impacts of the masonry product within the construction works, and thus consider the presence of mortar, etc.

B) Results in the impact tables reflect the life cycle impacts associated with the baseline product only. Impacts for other products in the EPD can be determined using a conversion factor. To determine the results for another product simply multiply the impacts for the baseline product by the appropriate conversion factor as follows:

- 1) Where applicable, multiply the results from the mortar column (under A5) by the mortar conversion factor.
- 2) Multiply all non-mortar column results by the applicable clay masonry product conversion factor for that product

Environmental Product Declaration

Endicott Brick

Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Additional Environmental Information

Environmental and Health During Manufacturing

At Endicott Clay Products, safeguarding the environment and implementing programs that promote health and safety are core values. Endicott takes a proactive approach, using information gathered from leading indicators to identify, assess, and mitigate health, safety, and environmental hazards. Following established OSHA, MSHA, DWEE, and EPA guidelines, Endicott Clay Products Company continually monitors its safety programs to promote the health and safety of our employees, contractors, visitors, and environment

Environmental and Health During Installation

Resources for health and safety of workers during the installation of clay masonry products:

Clay Masonry Units:

<https://www.osha.gov/silica-crystalline>

<https://www.cdc.gov/niosh/silica>

Mortar:

<https://www.cement.org/advocacy/occupational-health-and-safety/>

Extraordinary Effects

Fire

Brick is a noncombustible material, emitting zero volatile organic compounds (VOCs). For rated fire resistance of brick walls, reference International Building Code Table 721.1 (2). Refer to Technical Note 16 - Fire Resistance of Brick available at <https://www.gobrick.com/resources/technical-notes> for additional information.

Water

There are no negative impacts from the product due to its contact with water.

Mechanical Destruction

Resources for health and safety of workers during the mechanical destruction of clay masonry products:

Clay Masonry Units:

<https://www.osha.gov/silica-crystalline>

<https://www.cdc.gov/niosh/silica>

Delayed Emissions

Global warming potential is calculated using the TRACI 2.2 impact assessment methodology. Delayed emissions are not considered.

Environmental Activities and Certifications

For Endicott product sustainability information, see Technical Note 48 Sustainability and Brick available at

<https://www.endicott.com/TechnicalNotes>

Further Information

For additional information related to Sustainability, please contact our office at (402) 729-3315 or endicott@endicott.com.

Environmental Product Declaration

Endicott Brick
Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

References

- PCR Part B NSF/ASTM Clay Masonry Products PCR
- SimaPro 9.4 PRe Sustainability. SimaPro Life Cycle Assessment version 9 (software).
- ISO 14025 ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.
- ISO 14040 ISO 14040:2009-11, Environmental management — Life cycle assessment — Principles and framework.
- ISO 14044 ISO 14044:2006-10, Environmental management — Life cycle assessment — Requirements and guidelines.
- ISO 21930 ISO 21930:2017, Sustainability in buildings and civil engineering works - Core rules for environmental product
- NSF GPI NSF Program Operator Rules (2015)
- Characterization Method IPCC. 2014. Climate Change 2013. The Physical Science Basis. Cambridge University Press. (<http://www.ipcc.ch/report/ar5/wg1/>).
- Characterization Method Hauschild M.Z., & Wenzel H. Environmental Assessment of Products. Springer, US, Vol. 2, 1998.
- Characterization Method Jenkin M.E., & Hayman G.D. Photochemical ozone creation potentials for oxygenated volatile organic compounds: sensitivity to variations in kinetic and mechanistic parameters. Atmospheric Environment. 1999, 33 (8) pp. 1275-1293.
- Characterization Method WMO. 1999. Scientific Assessment of Ozone Depletion: 1998, World Meteorological Organization Global Ozone Research and Monitoring Project - Report No. 44, WMO, Geneva.
- Characterization Method Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers- version 1.2, January 2017.

Environmental Product Declaration

Endicott Brick

Clay Masonry Products



According to the following
ISO Standards: 14025,
14027, 14040, 14044,
21930:2017

Contact Information

Study Commissioner



For additional information related to Sustainability, please contact our office at (402) 729-3315 or endicott@endicott.com.

Endicott Clay Products Company/Endicott Thin Brick & Tile, LLC
P.O. Box 17
Fairbury, NE 68352

LCA Practitioner



Sustainable Solutions Corporation
155 Railroad Plaza, Suite 203
Royersford, PA 19468 USA
(+1) 610 569-1047
info@sustainablesolutionscorporation.com
www.sustainablesolutionscorporation.com