Mosa. Tiles. EPD Wall Tiles

EPD Wall Tiles

Product Description
The products in scope of this document are the Mosa wall tile collections.

Manufacturer
The wall tiles are manufactured in Maastricht, The Netherlands, by Royal Mosa B.V.

Mosa, founded in 1883, is an innovative Dutch tile company that manufactures its entire collection using sustainable production methods. Mosa is perceived as leading in the design of ceramic tiles; Mosa tiles have frequently been awarded international design awards. The company intends to also be a leader in sustainability, and in the pursuit of this goal cooperates with a number of relevant parties, such as German/American knowledge institute EPEA/MBDC, the founders of the Cradle to Cradle philosophy.
Mosa started working according to Cradle to Cradle in 2007, and meanwhile 99% of its tiles are Cradle to Cradle Silver certified. Since early 2011, Mosa is being designated as a Cradle to Cradle chartered organisation, an award reserved for those companies making an exceptional contribution to the implementation of the Cradle to Cradle philosophy in their operations. There are 12 such companies in the world, and of these, Mosa is the only tile manufacturer.

Mosa is active in 30 countries on 4 continents. Our key markets include western Europe, Scandinavia, Middle East and North America.

Mosa manufactures its products in accordance with the ISO 9001 as well as the ISO 14001 environmental care system.
Mosa's products are very suitable for the development of green buildings and buildings aiming at LEED or BREEAM certification. Mosa is member of the US, UK and Dutch Green Building Council as well as the German Sustainable Building Council.

For further information visit www.mosa.nl

Material Declaration
Mosa wall tiles consist of the materials listed below. The average weight is 10,24kg/m^2 excluding packaging.

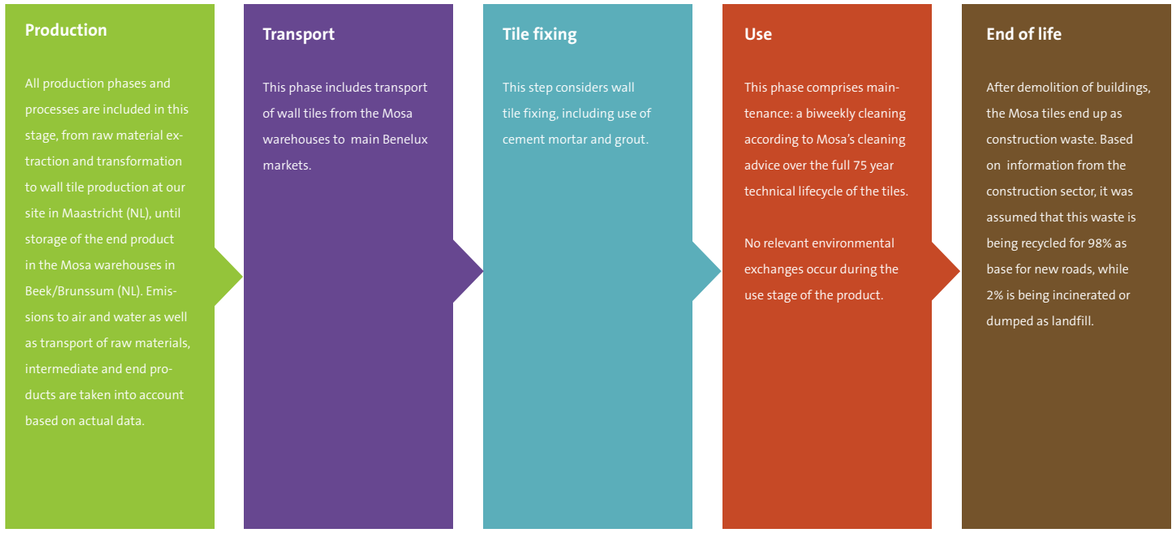
	kg/m²	%
Clay	3,48	34
Kaolin	0,86	8
Silica	1,93	19
Marlstone	1,16	11
Chalk	1,16	11
Feldspar	0,77	8
Scrap	0,42	4
Glaze and pigments	0,53	5

Silica and scrap are to be considered as preconsumer recycled content.

Environmental Product Declaration

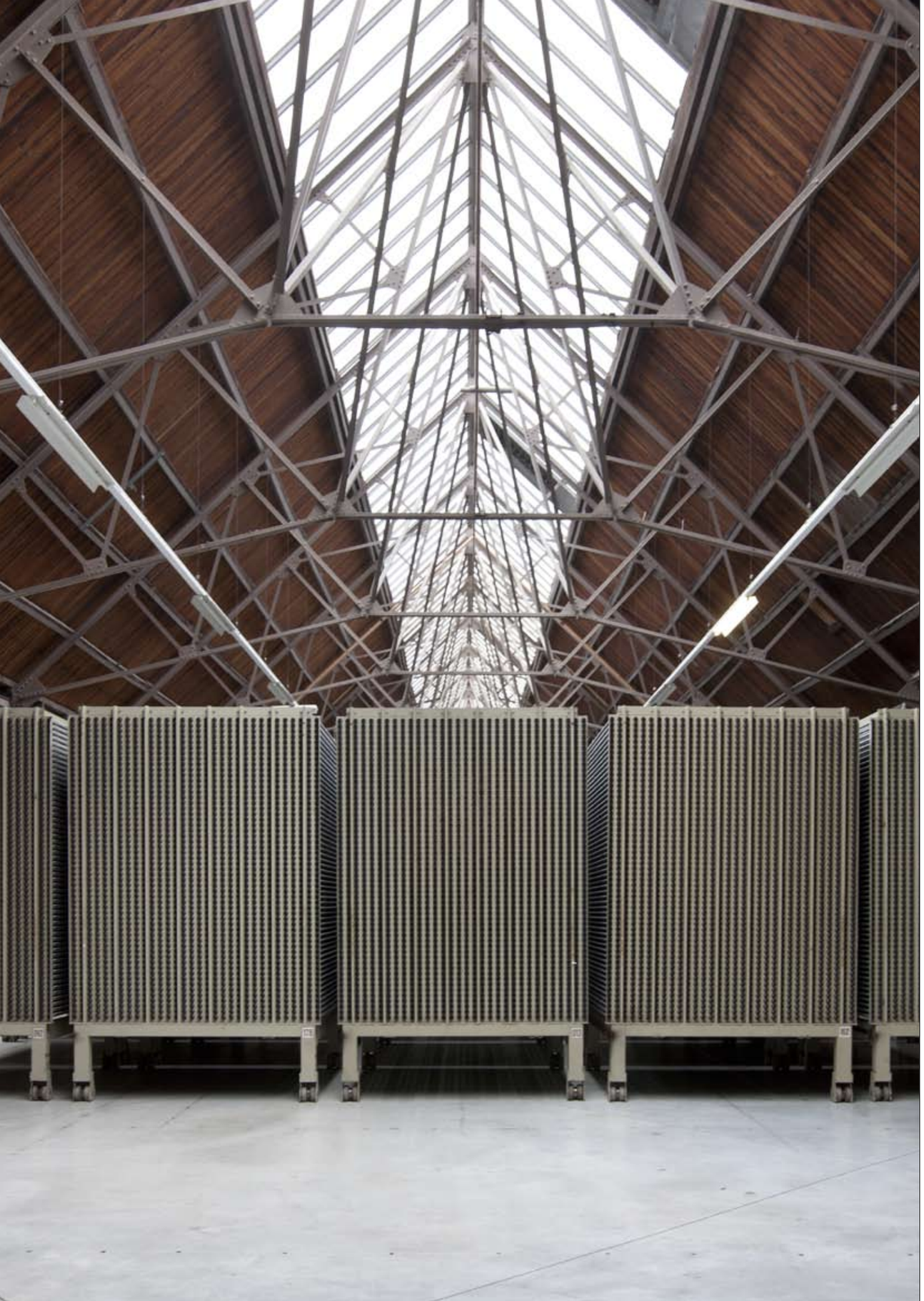
The environmental impact of the wall tiles throughout their entire life cycle, from raw materials extraction, transport, production, use to end-of-life, is analysed in this Life Cycle Assesment (LCA), which was compiled during 2010. Reference year for the input data is 2008. Where possible, input data which was collected for the C2C certification was used instead of general assumptions. The functional unit chosen for this LCA is *per m² wall surface*. This means 1m^2 fixed wall tile with a lifespan of 75 years.

Life Cycle Inventory Analysis
The life cycle inventory covers the life cycle stages as shown below.



Distribution of the environmental impacts for the relevant life cycle stages

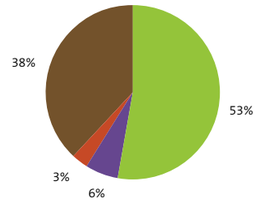
Impact category	Unit	Production Mosa wall tile	Transport	Tile fixing	Use and maintenance	End of life	Total
Global warming (GWP100)	kg CO2 eq	5,627	0,637	0,362	0,011	4,105	10,742
Ozone layer depletion (ODP)	kg CFC-11 eq	4,600E-07	8,460E-08	8,700E-09	5,802E-10	3,296E-07	8,835E-07
Photochemical oxidation	kg C2H4 eq	5,840E-04	3,678E-04	8,358E-05	5,165E-06	6,357E-04	1,676E-03
Acidification	kg SO2 eq	4,134E-03	2,279E-03	4,555E-04	4,394E-05	3,766E-03	1,068E-02
Eutrophication	kg PO4 eq	8,498E-04	5,013E-04	7,370E-05	2,745E-06	1,148E-03	2,576E-03
Non renewable, fossil	MJ eq	93,258	9,172	1,562	0,210	62,822	167,024



Environmental aspects of Mosa wall tiles during their life cycle

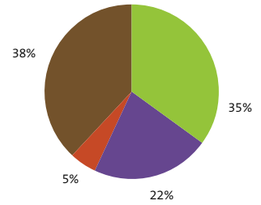
Global warming

Is an index for the rising of the global temperature due to the release of greenhouse gases in the atmosphere



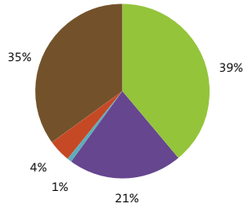
Photochemical smog

Is a type of air pollution affecting human health and the environment, caused by a reaction of nitrogen oxides and VOC's (volatile organic components) under the influence of heat and sunlight.



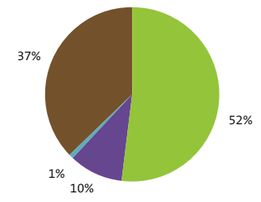
Acidification

Is the damage to trees and life in waters as well as accelerated degradation of materials (e.g. metals, limestone and concrete) due to emissions of acids



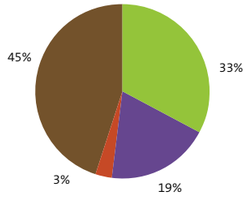
Ozone layer depletion

Is the decline of the ozone layer causing damage to plants, animals and human health (increased skin cancer risk), resulting from higher concentrations of harmful UV radiation due to emission of halocarbon refrigerants like CFC and freon.



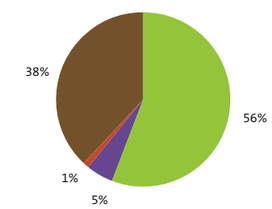
Eutrophication

Is the loss of plant and fish life in water due to oxygen deficiency following algae growth which is stimulated by high nutrient concentrations resulting from the release of nitrogen and fertilizers



Primary energy use

Use of non-renewable fossil energy embodied in natural resources that has not yet undergone any antropogenic transformation



Life Cycle Assesment
The graphs represent the contribution of the Mosa wall tile life cycle stages to environmental impact categories

- Production
- Transport
- Use
- Tile fixing
- End of life

Additional Environmental information

Cradle to Cradle®
Cradle to Cradle is an innovative, positive and integral framework for system design. Cradle to Cradle aims at redefining products, processes and systems in such a way that they provide financial, environmental and social benefits. Inspired by nature's cycle of life, in which nutrients at the end of their life cycle become nutrients again, Cradle to Cradle applies the principle of *waste equals food*; or, in other words, products being eco-effective rather than just efficient. The second principle, *use current solar income*, promotes the use of renewable energy. And finally, *celebrate diversity* calls for creativity and variety during product and system development.
The Cradle to Cradle program is developed by the German knowledge centre EPEA (www.epea.com), lead by Prof. Michael Braungart, in conjunction with the American agency MBDC headed by William McDonough. In the Cradle to Cradle program products are evaluated according to five criteria: composition of raw materials, recycling potential, energy use, water management and social fairness.

- **Pure raw materials**

Mosa tiles do not release any harmful compounds during their useful life and do not damage nature in case of accidental dumping. The main constituents of Mosa tiles are clay and sand, natural raw materials that are present in abundance in nature. Mosa C2C tiles are free of hazardous compounds such as lead, mercury or cadmium – the result of years of R&D in which all the tile ingredients – including our suppliers' raw material chain- were analysed and classified to ppm (parts per million) level. Very strict leaching tests carried out by independent laboratories were part of this program. The EPEA criteria governing the absence of hazardous compounds are much more stringent than the prevailing environmental legislation.

- **6 to 25% Recycling**

Mosa tiles contain solely natural raw materials and can be recycled. The tiles currently contain a percentage of *pre-consume*r recycled material originating from production waste and residual materials from the stone industry: wall tiles contain between 16 and 25 percent of recycled materials, depending on the type of tile, and floor tiles contain between 21 and 45 percent. Mosa is currently carrying out pilot trials with the waste collection sector to review the feasibility of a tile return system. These trials are limited to the return of used Mosa tiles that are suitable for reuse by virtue of a purity sufficient for eco-effective processing.

- **Closed process water cycle**

Mosa uses water during various production phases. Reusing water is an essential element of appropriate use of this scarce and expensive resource. The process water is purified in an in-house water treatment plant and the residual sludge is recycled in the tile production process. Since 2010 the cooling water cycle is closed, resulting in a 60% reduction of the total ground water volume to be pumped up.

- **48% reduction of CO2 emissions**

Continuous improvement of the production facilities, in combination with the switch to green electricity, generated by hydropower stations, has resulted in a 48% reduction of CO2 emissions per tonne finished product over the last ten years. During the same period the emission of fine dust particles was reduced by 91% to virtually none. The next step is to find more renewable energy sources for the longer term. From mid 2011, the residual heat from the furnaces will be reused in the production process and for heating of the buildings.

- **Local-for-local**

Mosa's ongoing efforts in improving the working environment in its plants have resulted in our working environments being rated as one of the best in the European ceramic tile industry. Mosa implements the local-for-local principle whenever possible. Production close to key markets in North West Europe results in 30 to 40% lower CO2 emissions per m2 tile surface. Furthermore, nearly all raw materials are sourced from controlled quarries in Holland, Germany and France, within a 500 kilometre radius from Maastricht. Mosa requires sustainable exploitation of quarries from material suppliers, plus an environment recovery plan after the exploitation period ends.

Mosa Tiles have been certified Silver by MBDC/EPEA, for their material content, recyclability and manufacturing characteristics.

Packaging and Transport
All our packaging materials are suitable for recycling. Paper and carton is produced from unbleached, recycled paper which can be reused. For transportation within Europe, 'Europallets' which are part of a pallet recycling system are used. All goods supplied to the USA are packed on heat treated pallets. Moreover, only trucks equipped with soot filters are allowed on the Mosa premises.

Green Buildings, LEED and BREEAM
Mosa tiles are very durable, chemically inert and have a technical lifetime of hundreds of years without losing their aesthetical appearance. They do not produce fumes or gases and are VOC free. Tiles contribute positively to the indoor climate and energy performance of a building and enhance effectivity of low temperature heating systems. Mosa products can help win projects sustainable building labels such as LEED and BREEAM. For up to date information on credit opportunities please refer to the Mosa website: www.mosa.nl/sustainability.

Compilation and verification process
The LCA and EPD are conducted with Tebodin according to the ISO 14040-ISO 14044 standards for LCA. The LCA is verified externally by IVAM University of Amsterdam, The Netherlands. The characterisation data used are from the EPD (2008) method, version 1.03, published in the document *Introduction, intended uses and key programme elements for the Environmental Product Declarations, EPD*, dated 29-02-2008.

References
ISO 14025: Environmental labels and declarations - Type III environmental declarations.

Liability
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