



Ceramic tile elements – possibility of meeting LEED and BREEAM criteria for complex building assessment



LASSELSBERGER, s.r.o.  
in Czech Republic

**3 brands**

**5 manufacturing plants**

**1600 employees**  
**sold in 67 countries**

**across 5 continents**



## TRADITION Czech brand

LASSELSBERGER, s.r.o. is the only producer of RAKO brand ceramic tiles in the Czech Republic, which rank amongst the leading producers in Europe. In 2018, the traditional Czech brand “RAKO” celebrates its 135<sup>th</sup> anniversary.

During this lengthy period, some exquisite designs have been created from RAKO ceramic tiles and have become an inseparable component of Czech cultural heritage. These can be witnessed at the Hotel Imperial or the Municipal House in Prague, Villa Tugendhat in Brno and many other exquisite buildings that are currently admired worldwide.

Today, the success of LASSELSBERGER, s.r.o. is driven by the modern RAKO HOME and RAKO OBJECT ceramic tiles, which

provide a comprehensive portfolio. This is aided by the ability to innovate and to react quickly and flexibly to special customer requests.





## QUALITY environmentally sound product control

Continuous and regular tests of our raw material tests ensure that every single product meets the strictest quality criteria. The high quality of RAKO product conforms to the quality and service control system as per the ISO 9001 international standard. Properties of ceramic tiling meet the requirements of the standard EN 14411:2016. Premium quality is confirmed by certificates from well-renowned testing facilities. Documents can be downloaded at [www.rako.cz](http://www.rako.cz)

The strategy of the company is to produce environmentally friendly products that meet applicable national and international standards

whilst utilizing environmentally friendly control systems. By releasing the environmental product declaration as per ISO 14025, the company has committed to adhering to strict environmental requirements. As a part of environmental protection, LASSELSBERGER, s.r.o. has been performing continuous research and making significant investments into water recycling, environmentally sound waste disposal, improvement of air quality and reduction of concentrations of gases released into the air with the goal of achieving zero pollution. With regards to the applicable regulations, we only use well-selected raw materials in our production and final products are packed using recyclable packaging materials.



## SERVICE open mind towards individual projects

In the world of business, it is essential to not only have quality products but to also provide fantastic customer service. LASSELSBERGER s.r.o. values the relationship with its project engineers, architects and other product users. Therefore expert advice is provided free of charge by our trained team of project specialists. This helps our customers ensure smooth implementation of their individual concepts. Technical consultation begins from the very start of the implementation to the conclusion of the contract.

Services provided include guidance on selecting suitable RAKO tile products and RAKO SYSTEM construction chemical products, calculation of required material amounts, laying design plans and recommendation of professional cleaning agents to both clean and maintain the finished surface.


To contact the project team, visit [www.rako.cz](http://www.rako.cz)





## Environmental systems building assessment

Production of construction materials has a significant environmental impact. Construction products represent an integral part of the overall environmental quality of buildings. There is no unified methodology for environmental specification of buildings. However, there have been efforts to establish international certification models for thorough assessment of buildings in terms of conformity with principles of sustainable buildings.



## Globally acknowledged systems



**LEED is a globally acknowledged certification model with the quickest-growing number of certifications.** It is used to evaluate the building upon its **creation** (New Construction or Core&Shell) or **later during its operation** (Existing Building: Operation and Maintenance EB:OM); it is also possible to certify internal **equipment of space for rent** (Commercial Interiors). The certification is based on evaluation of environmental impact, water and power consumption, used materials, interior quality and utility required for effective work.

LEED is a system with open and progressive development. Since the second half of 2015, it is necessary to raise the bar of requirements in the LEED v4 system. LEED offers a wide spectrum of alternative attainment of individual credits for Europe in scope of European standards and customs. The certification confers the highest-quality evaluation of building power demands via dynamic computer modelling.



**BREEAM CERTIFICATION is a globally established British system.** Outside of Britain, BREEAM is used in the format BREEAM International, which covers three sectors: **administrative buildings, commercial building, industrial and residential buildings**; individual frameworks are set for other cases. The certification is based on evaluation of environmental impact, water and power consumption, used materials, interior quality and utility required for effective work.

BREEAM is fully applicable for the European environment thanks to the link to European standards and referential standards specified for all European states, including the Czech Republic. It is more formal and more administratively demanding in contrast to the LEED certification. In terms of content, LEED and BREEAM are comparable for new buildings; for existing buildings, the system is completely different.





## LASSELSBERGER, s.r.o. Ceramic tiles

### Possibility of Meeting LEED and BREEAM Criteria for Complex Building Assessment

#### LEED 2009

##### MRc2 – Construction Waste Management

The intent of the credit is to minimize construction waste, more specifically its recycling. The required percentage to recycle is 50% for 1 point, 75% for 2 points and 95% to acquire an extra construction waste point.

The amount of recycled waste is calculated for the entire construction on the principle of volume or weight.

##### **Documents:**

**Product technical sheets** describe product packaging methods (the products are packed in paper packages, shipped on EUR pallets and packed using translucent foil). The organization is involved in the return system and the system of EKO-KOM package waste utilization.

The product is **recyclable** as an inert material; the packages are 100 % recyclable in terms of credit.

**1–2 points can be claimed**

##### MRc4 – Recycled Content

The intent of the credit is **usage of products containing recyclable raw materials** or parts. In order to get 1 point, it is necessary to demonstrate the post-consumption recyclable waste amount plus 0.5 pre-consumption recyclable waste amount, to a total of 10%; 2 points require 20% and one additional point requires 30% of a project's material costs. Recyclable content is defined as per ISO 14021. **Post-consumption** recyclable waste is defined as waste produced by households or other consumers as final product users and deemed unusable after this usage. **Pre-consumption** recyclable waste is defined as waste by-produced during production. This excludes waste reused in the same production process (e.g. shattered glass used to make another product batch).

Calculation of recycled content in products is defined on the basis of mass. Product value contribution is defined on the basis of costs.

**Cannot be applied**





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### LEED 2009

#### MRc5 – Regional Materials

The intent of the credit is **to minimize environmental load during transportation related to the construction**. In order to get 1 or 2 points, it is necessary to demonstrate that 10% (or 20% respectively - defined on the basis of total material costs) was mined and processed within 800 km from the construction site. In case only a part of the product meets these conditions, only that part is included (based on mass share).

#### Documents:

##### **Documented for a specific building and product.**

In case of construction within the Czech Republic, the regional material origin share is considered to be 97.5%.

**1–2 points may be claimed in connection with other materials.**

#### IEQc4.3 – Low-Emitting Materials—Flooring Systems

The intent of the credit is **to limit the pollution within the interior of the building**. The credit yields one point if all flooring materials, including ballasts and adhesives, meet the

limits for volatile organic compound content (VOC). Mineral based products do not contain organic finishes or adhesives and therefore do not need to be tested.

#### Documents:

**Ceramic tile elements** meet the criteria without any testing.

**1 point can be claimed**

#### SSc7.1 – Heat Island Effect – Non-roof

The goal of the credit is **to prevent the thermal island effect above the installation**; this effect is created during summer time by the sunlight impacting dark surfaces and transitioning into heat. Viable strategies include **selecting light colours for reinforced surfaces outside of the building**. The requirement is that the SRI (Solar Reflectance Index) be higher than 29. SRI must be declared by a test protocol. The value is defined according to Cool Roof Rating Council Standard (CRRC-1) and ASTM E 1980.

**Cannot be applied**



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## Possibility of Meeting LEED and BREEAM Criteria for Complex Building Assessment

### LEED V4 – NC, CS

#### MRc1 – Building life-cycle impact reduction

The applicable part is Option 4 – Whole-building life-cycle assessment, which **requires specification of impact of the whole building life-cycle assessment on the environment for at least. 60 years.**

**The evaluation aspects include:** greenhouse gas by-production, ozone layer compromising, acidification, eutrophication, creation of tropospheric ozone, usage of non-renewable energy sources. The goal is to demonstrate at least 10% improvement relative to the reference building.

#### **Documents:**

The product evaluation aspects **are available in EPD for the declared unit of 1 m<sup>2</sup> at the reference durability of 50 years** (this is an advantage in comparison to other materials).

**Can yield a maximum of 3 points in connection with other materials.**

#### MRc2 – Building product disclosure and optimization - environmental product declarations

Option 1: Use at least **20 different products from at least 5 suppliers**; the products are to meet one of the following criteria: Product-specific LCA, EPD as per ISO 14025, 14040, 14044 and EN15804 or ISO 21930 in the scope of “cradle to gate”, **product-specific EPD, type III** (for the specific product from the specific manufacturer, this demonstration has full point value).

#### **Documents:**

The manufacturer has **product-specific type III EPD** created and verified for the declared unit of 1m<sup>2</sup> at reference **durability of 50 years related to product groups** – see [www.rako.cz](http://www.rako.cz).

**1 point can be claimed**



## LASSELSBERGER, s.r.o. Ceramic tiles

### Possibility of Meeting LEED and BREEAM Criteria for Complex Building Assessment

#### LEED V4 – NC, CS

##### MRc3 – Building product disclosure and optimization - sourcing of raw materials

The credit is focused at –demonstration of environmentally friendly manufacturing procedures. Option 1 (1 point): For at least 20 permanently installed products from at least five suppliers, it is necessary to present a report containing the following aspects: Localization of resources, commitment to long-term environmentally responsible usage of the countryside, commitment to reducing negative impact of mining and processing, commitment to respecting applicable standards and programmes related to voluntary respecting of the specified criteria.

Products which have the report issued for them by their own supplier or manufacturer are factored in at 1/2.

##### **Documents:**

The company does not have Corporate Sustainability Reports (CSR) issued by a third party. Raw materials are mined by LB Minerals. Environmental goals are monitored as a part of the Environmental profile of the company and included in the annual reports.

Can yield a maximum of 1/2 point in connection with other materials.

##### MRc4 – Building product disclosure and optimization – material ingredients

Option 1 (1 point): Usage of at least 20 permanently installed products supplied by at least 5 different suppliers who use **chemical composition verification programmes** to a detail of 0.1% (according to CASRN).

Option 2 (1 point): Usage of products with optimized composition worth 25% of the project cost. Alternately, products not containing **REACH-conforming** substances or listed on REACH Authorization or Candidate List can be factored in at 100%.

Option 3 (1 point): Usage of products conforming with the supplier chain optimization – supplied by manufacturers with verified supplier chain information – worth 25% of the total project cost. **Documentation of exact product composition is expected, as well as implementation of EMS processes** (EMS certification).

##### **Documents:**

Safety sheets are available for all components. The product **does not contain** substances as per Candidate List of Substances of Very High Concern for authorisation. There is a manufacturer's declaration as per REACH for each product line – **Regulation (EC) No 1907/2006 of the European Parliament and of the Council**. Chemical product composition as per CASRN is not specified. EMS is not introduced and certified.

1 point can be claimed (Option 2).





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### Possibility of Meeting LEED and BREEAM Criteria for Complex Building Assessment

#### LEED V4 – NC, CS

##### MRc5 – Construction and demolition waste management

The intent of the credit is **to minimize construction waste**, more specifically its recycling. In order to get 1 point, it is necessary to sort and recycle 50%; 75% is required for 2 points (Option 1). Produce less waste than 12.2 kg per 1 m<sup>2</sup> of the building's floor area (Option 2).

##### Documents:

**Product technical sheets** describe product packaging methods (the products are packed in paper packages, shipped on EUR pallets and packed using translucent foil). The organization is involved in the return system and the system of EKO-KOM package waste utilization.

The product is **recyclable** as an inert material; the packages are 100% recyclable in terms of credit.

**1–2 points can be claimed**

##### EQc2 – Low-emitting materials

The intent of the credit is **to limit the pollution within the interior of the building**. The credit yields one point if all flooring materials, including ballasts and adhesives, meet the limits for volatile organic compound content (VOC).

Mineral based products do not contain organic finishes or adhesives and therefore do not need to be tested.

##### Documents:

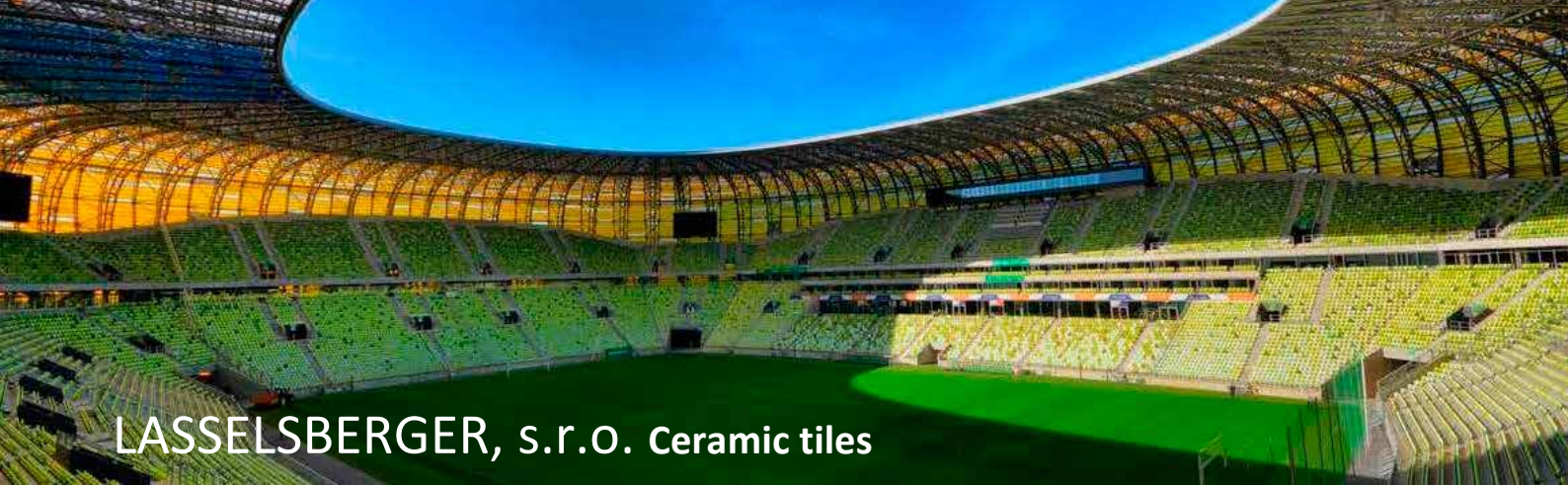
**Ceramic tile elements** meet the criteria without any testing.

**1 point can be claimed**

##### SSc5 – Heat Island Reduction

The goal of the credit is **to prevent the thermal island effect above the installation**; this effect is created during summer time by the sunlight impacting dark surfaces and transitioning into heat. Viable strategies include **selecting light colours for reinforced surfaces outside of the building**. The requirement is that the SRI (Solar Reflectance Index) be higher than 29. SRI must be declared by a test protocol. The value is defined according to Cool Roof Rating Council Standard (CRRC-1) and ASTM E 1980.

**Cannot be applied**



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## Possibility of Meeting LEED and BREEAM Criteria for Complex Building Assessment

### BREEAM

#### MAN 02: Life cycle cost and service life planning

This credit requires construction of the **LCC analysis** for at least 40 and optimally a 60-year life-cycle of the building, including construction, operation and maintenance according to ISO 15686. LCC analysis for individual structural groups of the building (envelope, technical equipment, final surfaces, external spaces). It is necessary to demonstrate that the selected **solution reduces total life-cycle costs** of the building. Maximum of 3 points

#### Documents:

EPD – specification **material data on installation and maintenance for a 50-year life-cycle**. Can be supplemented by price calculation for 1 m<sup>2</sup> and 50 years. Advantage compared to products with shorter lifespan or high maintenance.

**Can yield a maximum of 3 points, based on EPD data (chapter 2).**

#### MAT 01: Life cycle impacts

This credit can be worth up to 6 points, depending on the score attained in the LCA building analysis. The project is subjected to the LCA analysis in order to assess the environmental impact of the life-cycle of the individual components of the building. **EPD type III** – usage

having at least 5 certified products designed during the project phase and installed during the design phase is rewarded by 1 point

#### Documents:

EPD

**Can yield a minimum of 1 point**

#### MAT 03: Responsible sourcing of materials

1-point criteria: **Plan for responsible purchase of material and products**. Must be composed till the end of the conceptual building design phase and distributed among all of the process participants, sub-suppliers etc. The goal is to have certified products preferred in the process.

1–3-point criteria: Awarded for a **number of “responsibly sourced” materials and products** in certain categories (products for which the key process and supplier chain key process are **covered by EMS**.) (For ceramic parts, it is clay mining and the production itself).

**Cannot be applied**



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## Possibility of Meeting LEED and BREEAM Criteria for Complex Building Assessment

### BREEAM

#### WST 01: Construction waste management

1 point: **Specify goals for waste production** in m<sup>3</sup> or tonnes per 100 m<sup>2</sup>. Introduce waste minimization process. Monitor waste by-production. Appoint a responsible person.

1 point: **Significant waste reduction** Material sorting (at construction sites or elsewhere) by groups licensed by the supplier for recycling. Creating a report on definitive allocation of all waste.

#### **Documents:**

**Product technical sheets** describe product packaging methods (the products are packed in paper packages, shipped on EUR pallets and packed using translucent foil). The organization is involved in the return system and the system of EKO-KOM package waste utilization.

The product is **recyclable** as an inert material; the packages are 100% recyclable in terms of credit.

1–2 points can be claimed



# EPD Environmental product declaration (EPD)



## as per ISO 14 025 and EN 15 804

The strategy of LASSELSBERGER is to produce environmentally friendly products that meet applicable national and international standards and utilize environmentally friendly control systems.

By releasing the environmental product declaration (EPD) as per ISO 14 025 and EN 15 804, LASSELSBERGER has committed to adhering to the environmental requirements.

### Declaration of the manufacturer regarding environmental parameters derived from the LCA (life-cycle assessment):

Product system and system boundaries – see table 1

Table 1

Information on the limits of the product system – information modules (X = included, MNR = the module is not relevant)																
Production phase			Building phase		Usage phase							End of the life cycle phase				Additional information beyond the life cycle
Delivery of mineral materials	Transport	Production	Transport to the building site	Process of building/installation	Usage	Maintenance	Repair	Replacement	Reconstruction	Operational energy consumption	Operating water consumption	Demolition/deconstruction	Transport	Waste processing	Removal	Yields and costs beyond the system boundary. Potential re-usage, utilisation, recycling
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MNR	X	MNR	MNR	MNR	MNR	MNR	MNR	X	X	X	X



# EPD Environmental product declaration (EPD)

## as per ISO 14 025 and EN 15 804

Parameters describing environmental impacts

Environmental impact information is specified in the tables below, for product groups BIa, BIb and BIIL.

Table 2 – BIa

LCA result – Parameters describing environmental impacts (FU = 1 m <sup>2</sup> of the product)									
Parameter	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Global warming potential (GWP)	kg CO <sub>2</sub> eq.	8,18	2.19	0.766	1.65	0.564	4, 58E-2	4, 11E-2	-0,0539
Ozone layer depletion potential (ODP)	kg CFC 11 eq.	2, 34E-6	1, 51E-7	2, 21E-8	1, 52E-7	3, 76E-8	2, 98E-9	1, 23E-8	-6, 05E-9
Soil and water acidification potential (AP)	kg SO <sub>2</sub> eq.	0,0384	8, 04E-3	2, 15E-3	1, 06E-2	2, 19E-3	3, 20E-4	2, 44E-4	-3, 20E-4
Eutrophication potential (EP)	kg (PO <sub>4</sub> ) <sub>3</sub> - eq.	0,0254	1, 69E-3	3, 88E-4	2, 12E-3	5, 28E-4	7, 44E-5	5, 98E-5	-1, 14E-4
Ground-level ozone potential (POCP)	kg Ethene eq.	2, 08E-3	3, 27E-4	7, 46E-5	4, 69E-4	8, 15E-5	8, 30E-6	8, 98E-6	-1, 38E-5
Raw-material decrease potential (ADP-elements) for non-fossil sources	kg Sb eq.	8, 61E-6	5, 35E-6	7, 77E-7	1, 10E-5	1, 71E-6	1,39E-	8 0	3, 81E-9
Raw-material decrease potential (ADP-fossil fuels) for fossil sources	MU, calorific value	75,8	32.3	4.04	46.4	8.18	0.638	3, 79E-4	0,0756

Table 3 – BIb

LCA result – Parameters describing environmental impacts									
Parameter	Unit	A1-A3	A4	A5	B2	C2	C3	C4	D
Global warming potential (GWP)	kg CO <sub>2</sub> eq.	13,4	1.99	0.632	1.65	0.473	0.038	3, 45E-2	-4, 53E-2
Ozone layer depletion potential (ODP)	kg CFC 11 eq.	3, 67E-6	1, 38E-7	1, 79E-8	1, 52E-7	3, 15E-8	2, 50E-9	1, 03E-8	-5, 08E-9
Soil and water acidification potential (AP)	kg SO <sub>2</sub> eq.	6, 89E-2	6, 46E-3	1, 76E-3	1, 06E-2	1, 83E-3	2, 69E-4	2, 05E-4	-2, 69E-4
Eutrophication potential (EP)	kg (PO <sub>4</sub> ) <sub>3</sub> - eq.	3, 16E-2	1, 47E-3	3, 07E-4	2, 12E-3	4, 43E-4	6, 24E-5	5, 02E-5	-9, 58E-5
Ground-level ozone potential (POCP)	kg Ethene eq.	3, 35E-3	2, 71E-4	6, 00E-5	4, 69E-4	6, 84E-5	6, 97E-6	7, 54E-6	-1, 16E-5
Raw-material decrease potential (ADP-elements) for non-fossil sources	kg Sb eq.	2, 67E-5	4, 97E-6	6, 84E-7	1, 10E-5	1, 43E-6	1, 17E-8	0	2, 36E-9
Raw-material decrease potential (ADP-fossil fuels) for fossil sources	MJ, thermal power	136	29.4	3.45	46.4	6.86	0.535	3, 18E-4	0,0634



# EPD Environmental product declaration (EPD)

as per ISO 14 025 and EN 15 804



Table 4 – BIII

LCA result – Parameters describing environmental impacts									
Parameter	Unit	A1–A3	A4	A5	B2	C2	C3	C4	D
Global warming potential (GWP)	kg CO2 eq.	8,40	1.52	0.756	0.127	0.370	3,00E-2	2,69E-2	-3,54E-2
Ozone layer depletion potential (ODP)	kg CFC 11 eq.	1,94E-6	1,05E-7	2,16E-8	1,17E-8	2,46E-8	1,95E-9	8,07E-9	-3,97E-9
Soil and water acidification potential (AP)	kg SO2 eq.	4,51E-2	5,22E-3	2,12E-3	8,19E-4	1,43E-3	2,10E-4	1,6E-4	-2,10E-4
Eutrophication potential (EP)	kg (PO4)3- eq.	2,12E-2	1,15E-3	3,73E-4	1,63E-4	3,46E-4	4,88E-5	3,92E-5	-7,48E-5
Ground-level ozone potential (POCP)	kg Ethene eq.	2,16E-3	2,16E-3	7,30E-5	3,60E-5	5,35E-5	5,44E-6	5,89E-6	-9,06E-6
Raw-material decrease potential (ADP-elements) for non-fossil sources	kg Sb eq.	1,80E-5	3,77E-6	8,08E-7	8,46E-7	1,12E-6	9,14E-9	0	1,84E-9
Raw-material decrease potential (ADP-fossil fuels) for fossil sources	MJ, thermal power	91,8	22.5	4.15	3.57	5.36	0.418	2,49E-4	4,95E-2

All of the information supplementing the building assessment as per LEED and BREEAM are available from the quality manager of LASSELSBERGER s.r.o.

For detailed information, visit [www.rako.cz](http://www.rako.cz)