

BUILD



A MAGAZINE FROM LECA®



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SAVE THE BEES, SAVE ENERGY AND PROTECT AGAINST WATER



As the headline suggests, the content of this edition of the international Leca magazine is quite a mixture. When we are asked what Leca is used for, we are

tempted to answer: almost everything. Some examples and evidence of this can be seen in this magazine.

Poland is an animal loving country, and Leca solutions help the bees to get food and drink, and ensures that fish in aquariums have clean water.

In Denmark, one of Copenhagen's most impressive cultural buildings, Skuespilhuset (The Actors' house), was built almost on the water, assisted by Leca aggregates.

In Finland energy efficient residential buildings are built with isolated Leca blocks, and in Norway they even build passive houses with these blocks. Please also take a look at the architectural gem of a home that has been built with Leca blocks in Portugal.

Water is one of the biggest challenges within construction, and in Sweden they solve moisture problems in swimming pools by building solid Leca walls. In Finland smart solutions have been invented for dry buildings using Leca aggregates.

In Finland you will find examples of road construction on poor quality foundations, a problem which can be solved in a safe and economic way with Leca aggregates. In Norway a public bath had back-filling with Leca pneumatically blown into place on a building site with difficult access.

So even if you cannot see it in everyday life, Leca is around you everywhere. You will find evidence of this throughout this magazine.

Torben Dyrberg
Managing Director
Leca InternationalTis





ART MEETS ENGINEERING

DENMARK *Leca® lightweight aggregate played an important role when the Royal Danish Playhouse was built on the harbour front in Copenhagen.*

Within construction, challenges are often complex, but the solutions are sometimes not. When the Royal Danish Playhouse in Copenhagen was built, one of the main challenges was to manage the water drainage. The cubistic building houses three different stages, back-stage facilities for the actors, restaurants and office space. It was designed by architects Lundgaard & Tranberg, and most of the playhouse is actually located under the water table. Building in such close proximity to water means that the infiltration of water is to a certain extent inevitable. But this did not have to pose a problem.

The solution

The basement floor of the Playhouse consists of two concrete walls. The engineering solution was to drain the water which seeped through the outer wall, leaving the inner wall dry. Leca lightweight aggregate (10-20mm) with its low density and high strength was perfect for the job; being utilised as a drainage solution between the two basement walls. Whilst draining the surplus water, the solution offered by Leca lightweight aggregate provided increased interior comfort and improved cost efficiency due to the high level of thermal insulation - an important asset in most Northern countries.

Easy to work with

Another important aspect of choosing Leca lightweight aggregate for the Royal Danish Playhouse was the flexible way the product was applied. The pellets were pneumatically blown into place (one cubic metre takes about a minute). In other words, the truck could be parked up to 60 metres away and deliver the Leca lightweight aggregate through a hose - easy to do and obviously a time saving way to move the construction process forward for both the client and engineer. Today, both actors and guests are enjoying the modern Playhouse, and Shakespeare, Beckett and Strindberg can be found in a building of the future.

Leca® facts

Construction Client The Royal Danish Theatre / Ministry of Culture

Architect Lundgaard & Tranberg Architects

Leca products Leca® 10-20



BLOWING LECA® WAS THE ONLY SOLUTION

NORWAY – Leca® lightweight aggregate was the best option we had for filling in behind the new swimming pool in Drøbak, says construction manager Ole Jørgen Fjeld from HENT Entreprenør.

The entire project, which will provide Drøbak with an upgraded sports hall and brand new swimming and bathing facilities is due for completion in the summer of 2018. The swimming pool will open in December of this year and admission will be free of charge during the Christmas holidays. The new swimming facility has an area of 6,000 square metres and features diving towers at 1, 3 and 5 metres, as well as a therapy pool and wave pool. The old Frogg Hall has been completely refurbished and now has expanded office space.

– Between the hillside and the

pool it is a bit of squeeze to get in. We wouldn't have been able to use normal materials. Blowing in Leca lightweight aggregate on site was the only way of filling it up, says construction manager Ole Jørgen Fjeld from HENT Entreprenør.

Insulates and drains

In total, almost 2,000 cubic metres behind the new pool is due to be filled with Leca lightweight aggregate. It has not yet been decided whether it will be filled with Leca right to the top, or whether a supporting layer will be laid on the top of the other materials.

– We have had good experiences using Leca in situations like these. In addition to being easy to put in place, it features good drainage and insulating properties that are better than those found in conventional fillers.

Drøbak swimming pool is being rebuilt as a Passivhaus structure, but the insulation effect provided by Leca lightweight aggregate has not been included in the calculations.

– We have not reduced the levels of insulation in the walls, but we anticipate that it will provide additional benefits once the building is in use, says Fjeld.



The new Drøbaksbadet and the refurbished Frogn Hall are located side by the side. (Illustration: White Arkitekter)

It is a squeeze between the mountainside and the newly built Drøbaksbadet swimming pool. – Leca lightweight aggregate was the only product we could use for filling in this situation. It has saved us time and was very easy to put in situ through using a blowing vehicle, says construction manager Ole Jørgen Fjeld.

Construction manager Ole Jørgen Fjeld from HENT Entreprenør.



Project details

Facility Drøbaksbadet / Frogn Hall

Developer Municipality of Frogn

Contractor HENT Entreprenør

Architect White arkitekter

Leca products Leca® lightweight aggregate.



A 350 square metre wall was constructed against existing buildings using Leca Isoblock 25.

Master bricklayer Per Thiesen of Constructa Entreprenør AS had all the Leca required for the car park lifted in prior to the concrete decks being laid.

Per Thiesen of Constructa Entreprenør AS has been responsible for all masonry work as part of the project.

Nøstet Panorama is one of several projects constructed on the quayside in Bergen's Nøstet district. A lot of Leca lightweight aggregate has been used in the buildings, especially in the car park.

ON THE QUAYSIDE

NORWAY *The former port area of Nøstet in Bergen is becoming increasingly residential. Nøstet Panorama is one of several new projects.*

As in many other towns and cities, the quayside in Bergen is being converted into residential and office space. In Bergen, the Nøstet area has been characterised by industrial buildings, and in recent years has been the home of the TV 2 television channel.

Nøstet Panorama has an area of 16,000 sqm and houses 98 apartments ranging from 35 to 150 square metres. On the lower floor there is a large car park.

– A lot of Leca Lettvegg Blocks have been used in the car park stalls and partition walls. It was a challenge to implement this because we had to lift in everything we were going to use before we had access, explains Per Thiesen, Master Bricklayer at Constructa Entreprenør.

A 350 square metre wall covering nine storeys has been built using Leca Isoblock 25 against the existing buildings already in the area.

Render on the base

The bottom three floors of the buildings are clad in a façade solution provided by Weber.

– We chose to use coloured render. The wall withstands more bumps and scratches caused by vehicles, road users or bicycles that are leant against the wall, Thiesen says.

The project began in 2013 and was completed in 2016.

– This was a big masonry job featuring both internal and external walls in addition to a major rendering job at ground level, Thiesen says.

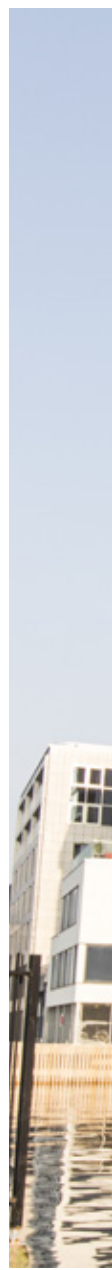
Leca® facts

Developer Nøstet Panorama AS

Contractor Constructa Entreprenør AS

Architect Link Arkitekter

Leca products Leca® Isoblock 25 cm, Leca® Lettvegg Blocks







PASSIVHAUS IN LECA®

NORWAY – We wanted to learn more about Leca® and Passivhaus buildings, says Inger Kristin Ulveseth of Brødrene Ulveseth, explaining why the bricklaying firm opted to construct two detached houses using Isoblock 35.

Leca® facts

Contractor Brødrene Ulveseth AS

Architect ABO Plan & Arkitektur AS

Leca products Leca® Isoblock 35 cm,
Leca® Basic Blocks 15 and 20 cm,
Leca® Lettvegg Blocks, Leca® Elements

The Passivhaus standard sets out strict requirements concerning energy consumption. The goal is for buildings to have particularly low levels of energy use that reduces their environmental impact. Passivhaus buildings have been especially popular in Germany and Scandinavia.

– As a masonry firm, we wanted to create a decent Leca house when building our first Passivhaus. Originally, the plan was to build the house using timber, but we opted to

use Leca for all elements, says Inger Kristin Ulveseth, CEO of Brødrene Ulveseth AS.

Brødrene Ulveseth has a long history of masonry building. Since being established in 1932, the firm has been involved in all kinds of projects. Today, they continue to construct in a diverse variety of building projects, but there is a particular emphasis on industrial buildings and apartment buildings.

Low energy house

The choice was to build the house using Leca Isoblock 35. The blocks almost satisfy the stringent Passivhaus requirements by themselves. With 10 cm cladding and insulation on the inside, the buildings require minimal energy to heat.

– We have used Leca lightweight aggregate in all areas where it was possible. Interior supporting walls are constructed with ordinary Leca blocks, while non-load bearing walls have

Magnus Mjelstad and Inger Kristine Ulveseth from contracting firm Brødrene Ulveseth AS wanted to build a genuine Leca house. – Originally, we planned to build using timber, but Leca was a better solution in this climate, they say.

The two family homes have thick walls built using Leca Isoblock 35 and require very little energy to heat. – You notice that they are good, cosy houses, says Inger Kristine Ulveseth of Brødrene Ulveseth.

The two detached houses are not far apart, but are secluded from each other.

Built using Leca from top to bottom, the two Passivhaus homes are airtight, warm and energy efficient.



been assembled using Leca Lettvegg Blocks. Additionally, Leca Elements have been used for the floor, says Project Manager Magnus Mjelstad. Residents moved in from smaller homes, but have found that the Leca houses require far less energy to keep warm.

Solid materials

An additional benefit of using Leca lightweight aggregate is that the heavy material ensures that the acoustic insulation of the buildings is very good.

– Experience shows that residents can barely hear sounds from outside their home unless they open a door or window. You notice at once when you come inside that they are pleasant homes to be in, says Ulveseth.

Another advantage, given how windy Western Norway can be, is that the buildings are airtight. Even on the windiest days, there are no drafts that penetrate into the houses.

– In a climate where rain and snow doesn't always come from

above - sometimes it comes sideways - it is crucial that the façade and exterior walls can withstand difficult weather conditions. The render on the walls is strong and will deal with everything western Norwegian weather can throw at it for a long time to come, says Magnus Mjelstad and Inger Kristin Ulveseth of Brødrene Ulveseth AS.



Jadwiga and Piotr Szwatek run the Szwatek Family Apiary.

LECA® HELPS TO TAKE CARE OF HONEY BEES

POLAND Honey bees are very important for humans. Without them many plant species would become extinct and crop yields would be much lower. It has recently turned out that Leca® may improve the well-being of these useful flying insects.

Honey bees are very important for humans. Without them many plant species would become extinct and crop yields would be much lower. We may not realise that more than 80% of plants are pollinated by bees. Even Albert Einstein once said that *"If the bee disappeared off the surface of the globe, then man would have only four years of life left,"* says Piotr Szwatek, owner of a family apiary. How can we help these beneficial insects stay in a good condition?

Access to water in spring

After waking up from the winter sleep bees need water but sometimes there is no dew on plants. Moreover, apiaries are often located far away from natural watercourses. Bees that are still weak and numb after their winter hibernation find it very difficult to carry water to their beehives, so it is important to provide

bee water pans in apiaries.

Thirsty bees often come to drink from natural still water reservoirs, but unfortunately many of them drown. Beekeepers try to prevent this in many different ways. They provide their apiaries with water pans filled with straw, moss or tree branches, but all these natural materials go rotten over time and pollute water, therefore, they need frequent replacement.

A simple solution to the problem is to add a thin layer of an eco-friendly material like Leca to the water pan.

Plastic high-volume containers with a sizeable water table filled with Leca and half-buried into the ground or placed near the apiary work very well to solve this issue. A thin, 2-3 cm layer of floating Leca gives bees a spot to land and drink safely.

Piotr Szwatek, who runs the apiary together with his wife Jadwiga,

says that thanks to its dark colour the Leca lightweight aggregate quickly heats up in the sun. – It is particularly important in springtime to give bees access to water as close to the hive as possible and to make sure they do not freeze when the air temperature can still be very low, he adds. Thanks to the surface tension of the water, the surface of the aggregate remains moist all the time. Another advantage of Leca is that as a ceramic material it does not react with water, so the water stays fresh for a longer time. Leca also prevents rapid evaporation of water which means that the water pan can be refilled less often, saving time and water.

Feeding bees in the autumn

When people harvest honey from beehives they deplete the precious resources the bees have gathered to survive difficult times in the autumn,



A bucket with floating Leca ready for filling with a syrup.



Upper side feeder placed inside a beehive.



An open drinker.



Floating aggregate is a solid landing surface for bees.

winter and early spring in a good condition. There must be compensation for this loss. Beekeepers feed bees most often with home-made sugar syrup or commercially available inverted syrups made for example from beetroots or wheat. For this, they place different kinds of feeders into the beehives depending on the feeding system used.

Leca lightweight aggregate can provide additional usefulness through its fundamental properties in saving bees from drowning and helping them to convert the syrup into winter feed. Through using the Leca lightweight aggregate it is easier to make sure the insects will be safely fed. The material is chemically neutral so it does not react with the syrup and helps to keep it fresh for a longer period of time.

Leca® facts

Facility Szwałek Family Apiary

Location Pelplin, Poland

Products Leca® KERAMZYT ogrodniczy L & M



THE GRASS IS GREENER ON OUR SIDE OF THE FENCE

POLAND *An interview with Justyna Kaleta, gardening engineer and owner of the "Justyna" Plant Nursery in Gdańsk, who has been using a Leca® based technology in her business for many years*

When did you come across Leca for the first time?

– More than 30 years ago in my family home. I watched my parents (who were also gardeners) repotting plants and I saw that at the bottom of each pot they would put a handful of brownish pellets. It attracted my attention as in the past, before expanded clay was available on the market, they would use pieces of broken pottery or brick rubble to ensure drainage in the pots.

How can Leca be useful in plant cultivation?

– First of all, the aggregate can be used in almost every gardening situation – in home gardens, window boxes, pot plants grown indoors, on

terraces, balconies and green areas around buildings.

– Leca lightweight aggregate regulates the water management system of plants and mixed with soil allows easier access of air to the roots. A layer of Leca on the surface of the soil in a pot reduces the evaporation of water so the plants can be watered less frequently. It also prevents the loss of precious humus in the substrate and offers an excellent protection against rodents. As you can see, this product has multiple applications.

Do you have any personal favourite applications of this product?

– I recommend it above all for the drainage of plants – a few

centimetres of Leca placed in the planting hole ensures effective water management. During periods of heavy rain, moisture is accumulated in the space between the pellets and on their surface and subsequently, in dry periods, it is returned to the root system of the plants. The same applies to pot plants. Leca absorbs water and prevents the decay of roots in the case of overwatering.

– Leca works like a well-stocked pantry. It absorbs excess water in the substrate and stores the nutrients contained in it in order to return them to plants in periods of drought and nutrient deficit.



The most unusual application of Leca which you have come across in your experience is...

– ... filtration of water in fish bowls. One of our customers regularly bought Leca for his fish bowl and both the fish and the water plants flourished in its presence. I also heard about large size Leca being used for the purpose of cleaning garden ponds. Things that are natural always work well in the world of nature.

After so many years of working with the product, what does Leca mean to you now?

– First of all, it is a ceramic material made of Polish clay. Although its colour is not as red as brick or roof tiles, the very fact that it is made of clay means

that it is a natural ceramic. And if you just look around you can see that clay is a timeless material. Historical buildings or walls built of brick centuries ago have survived many freezing winters and hot summers, despite acid rain and air pollution.

Do your customers also appreciate the properties of the product?

– Absolutely. We have been selling Leca on an ongoing basis for a dozen years or so and every year the number of people who have discovered its advantages has been growing. Just like our sales! Plant lovers appreciate Leca as a reliable, domestic and eco-friendly product. In this case, the grass is greener on our side.

Justyna Kaleta gardening engineer

Interviewed by Leca Technical Adviser.

Leca® facts

Facility “Justyna” Plant Nursery

Location Gdańsk, Poland

Products Leca® KERAMZYT ogrodniczy L & M



RENOVATION OF OLD BRICK VAULTS OF STARA ORUNIA

POLAND *Big problems occurred during the renovation of Stara Orunia, such as insufficient load-bearing capacity of old brick structures and low thermal insulation. Both were successfully solved by Leca® lightweight aggregate.*

During the renovation of the historical underground water reservoir called Stara Orunia in Gdańsk, the limited load-bearing capacity of the structure and poor thermal insulation of old brick vaults were among the problems that had to be solved. Both engineering issues were successfully overcome by the replacement of the old heavy vault filling with Leca lightweight aggregate.

Two in one

After removing the soil cover from the water reservoir roof, the brick vaults were repaired, waterproofing was applied and the whole ceiling structure was filled with Leca with a granule size of 10-20 mm. This lightweight ceramic aggregate is five times lighter than the removed soil. Additionally, the thermal efficiency of the new filling is much greater. This way, thanks to the replacement

of the old filling with Leca, two major problems were solved in the renovated facility.

Reliable structure

Renovation of a historical structure of such an importance requires detailed and comprehensive preparation at the design stage. The building design for the project was executed by KMS Design.

– An underground water reservoir must be effectively protected against the adverse impact of numerous external factors. This is particularly true of historical buildings subject to heritage conservation laws under which the existing structure may not be replaced or radically modernized. In our project of renovation of a historical water reservoir, the main goal was to preserve the original vault ceilings, which were of unique historical value. In such cases,

Leca is irreplaceable as the engineering solution as the filling of the ceiling structure because it helps to reduce internal forces in brick arches, whilst maintaining a balance between expansion and lateral pressure. The same effect cannot be achieved with other materials, such as Styrofoam, which does not generate sufficient expansion force to ensure the stability of the reservoir sidewalls, says Maciej Kotecki, the engineer responsible for the design of the water reservoir structure.

– When used as a filling, Leca, being a lightweight insulation material, considerably improved the overall thermal balance of the reservoir and prevented the freezing of the structure. Leca is a material with high frost-resistance and provides durability for many, many years, says Maciej Kotecki.

After the brick vaults were repaired waterproofing was made.

The whole ceiling structure was filled with Leca KERAMZYT 10-20 mm.

The historical underground facility Stara Orunia after renovation.



No trouble on the construction site

The construction work during the project “Renovation and Adaptation for Sightseeing Purposes of the Unused Stara Orunia Water Reservoir”, implemented as part of the Gdańsk Waterway investment programme, was carried out by the Budomex company from Sopot.

– Laying Leca on the brick ceiling was a smooth and easy process. The local Leca Technical Adviser made sure that the material was delivered to the construction site on time. For the contractor, Leca is a very friendly material. You can place it on the ceiling quickly and easily. No material was wasted during the process. The reduced application time and 100% efficiency were qualities which encourage us to use Leca in other projects too, says Ryszard Ankiewicz, chairman of Budomex company.

Stara Orunia Water Reservoir was built in 1869 as the first part of a modern water distribution system in Gdańsk. It was one of the first investments of this kind in Europe. The brick and earth structure had a capacity of over 5,000 m³ and remained operable until 1978.

In recent years, a decision was made to renovate the historical underground facility and make it accessible to visitors as part of the so called Gdańsk Waterway. At present the reservoir is also a natural habitat for bats. Every winter hundreds of bats of nearly all species found in Poland come to Stara Orunia for the hibernation period.

Leca® facts

Project Renovation of Stara Orunia water reservoir

Location Gdańsk, Poland

Design PPROFIL Design Studio

Building design KMS Maciej Kotecki Gdańsk

Contractor BUDOMEX Sopot

Product Leca® KERAMZYT 10-20 mm



From the upstairs living area, one can reach a roof terrace located above a two-car garage and storage premises.

With Leca sandwich blocks it is quick and easy to build a construction ready for rendering and inner wall plastering.



ENERGY-EFFICIENT MODERN HOME

FINLAND *A couple who made a decision to move from an apartment block into their own small house built from Leca® sandwich blocks recommends such a construction for anyone who desires a house that is designed for the needs of their family.*

Text: Sampsa Heilä and Vesa Airio
Photos: Visual Tailors

A uniquely designed stone house set amidst natural peace and quiet, yet only fifteen minutes drive from downtown Tampere: this is the new home of Henri and Aija Lipsanen, which the couple moved into in the summer of 2016.

– We wanted a modern, graceful stone house, which is durable and easy to maintain. We looked at many different stone house solutions, and we ended up with the Leca sandwich block house. Its polyurethane insu-

lated Leca blocks also offer excellent energy efficiency. One important factor was, of course, the fact that the solution was also competitively priced, says Henri Lipsanen.

– One benefit of moving into the new house is that we no longer have to listen to the noises of our neighbours and can enjoy our own peace and quiet. Due to the thick Leca sandwich blocks, noise and heat remain exactly where they should be, says Henri Lipsanen.



The Lipsanen family wanted the living room, dining room and kitchen to form a single common open space, two storeys high.

The architect Kaarlo Rohola, explains his appreciation of the uniform material feeling of the rendered stone house, which extends from the surface of the rendered throughout the bearing structure.

High open space and a large roof terrace

Fire protection is also one of the advantages of a stone house.

– The wooden house of a family we know unfortunately burned down. A stone house also retains its value well, in the event that we decide to move on.

The Lipsanen family wanted the living room, dining room and kitchen to form a single common open space, two storeys high.

From the upstairs living area, one can reach a roof terrace located above a two-car garage and storage premises. The terrace is frequently used during the summer season.

– The waterproofing of such a roof terrace in a stone house is much easier and less risky to implement than with a wooden house.

Clear architecture and living comfort

The chief designer of the house is architectural firm Kaarlo Rohola Ltd.

According to Kaarlo Rohola, the design task was particularly pleasing because he himself greatly appreciated the clear and modern architecture desired by the clients.

The architect explains his appreciation of the uniform material feeling of the rendered stone house, which extends from the surface of the plaster throughout the bearing structure.

– Well, a stone house is clearly distinguished, for example, by its floor structures, which are almost free of vibrations when someone moves around upstairs. The massive stone structure stores heat effectively and equalizes the internal temperature fluctuations. The temperature remains at a pleasant level, even if the outside gets colder or warms up quickly. It brings more comfort to living, says Kaarlo Rohola.



Leca® facts

Client Henri and Aija Lipsanen

Main Contractor Suomen Koti Rakennuttajat SKR Ltd

Architect Architectural firm Kaarlo Rohola Ltd

Leca products Leca® sandwich blocks, Leca® EasyLex partition walls



LECA® DELIVERIES TO WEATHER SHELTER

FINLAND In the renovation of Nurmijärvi municipal office building, Leca® aggregate is raised onto the roof of the location in a lifting box, which is attached to a long hose. In this case, required weather shelter doesn't need to be kept open as much and, thus, the work is easier.

The extensive renovation of Nurmijärvi municipal office building was launched in November. In the renovation, the roof was to be completely rebuilt under a weather shelter.

– Moisture safety is increased by the fact that the renovation of the roof is made entirely as dry-work. As the installation platform for the water insulation, Leca roofing tiles are used, instead of casting a normal 5 cm thick concrete slab on top of the Leca aggregate, says project manager Jorma Anttila from Ruuffi Oy. Ruuffi is the roof contractor for the renovation.

Leca roofing tiles are lightweight but strong and they have good heat insulation properties, as opposed to concrete.

The hose facilitates distribution of the Leca aggregate

The location is the first site for Ruuffi in which Leca aggregate is delivered to the roof with the Leca developed “hose skip” in which a ten meter hose is installed to the lifting box.

– When the skip is raised high up on to the roof, the distribution of Leca aggregate is conveniently taken care of through a hose to various

locations, so that the weather shelter does not have to be opened up as much, says Jorma Anttila.

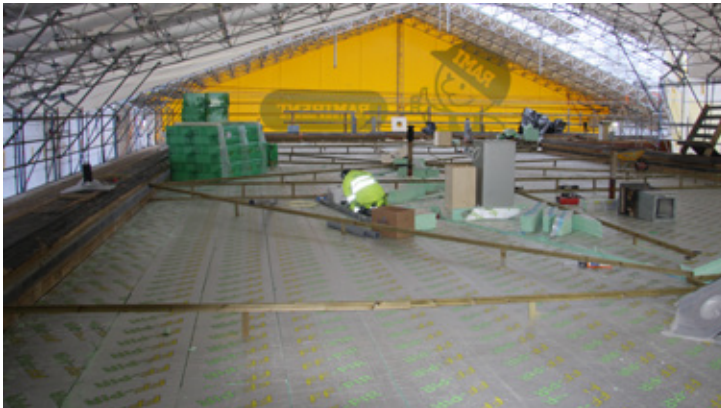
In connection with the dismantling of the old roof structure, light aggregate was removed from the roof with a vacuum truck, and it was reused around the building for external frost protection.

Leca is the most economic and most secure against moisture

The responsibility for the renovation of the municipal office building is held by engineering office Kimmo Kaitila Oy. According to the managing



As the installation platform for the water insulation, lightweight aggregate concrete roofing tiles are used, instead of casting a normal 5 cm thick concrete slab on top of the Leca aggregate,” says project manager Jorma Anttila from Ruuffi Oy.



“The hybrid roof combines efficient thermal insulation and the good ventilation of the light aggregate. The good ventilation and moisture resistance properties of Leca aggregate, as well as its ability to dry itself, are clear advantages in the moisture management of the construction”, says Jari Salminen

Leca aggregate is raised onto the roof of in a lifting box, which is attached to a long hose. In this case, required weather protection doesn't need to be kept open as much and, thus, the work is easier.

Leca aggregate is raised onto the roof of the location in a lifting box, which is attached to a long hose.



director of the company, Jari Salminen, in order to meet current thermal insulation requirements, a hybrid roof formed from Leca aggregate was decided upon, as the total thickness of the roof is only slightly more than half a meter and there was no wish to change the height of the eaves.

– The hybrid roof combines efficient thermal insulation and the good ventilation of the light aggregate. When we considered the roof ventilation, we stated that it is the most cost effective and safest way to implement with Leca aggregate, as it

had been done in the past. The good ventilation and moisture resistance properties of Leca aggregate, as well as its ability to dry itself, are clear advantages in the moisture management of the construction, says Jari Salminen.

In addition, the inclinations leading to the roof drains are very simple and the most cost-effective to carry out.

Text: Sampsa Heilä
Photos: Leca Finland

Leca®

Client Nurmijärvi municipal office building

Main contractor MM-Yritysrakentaja Oy

Roofing contractor Ruuffi Oy

Architectural design Architects office Aarne von Boehm Oy

Structural design Engineers office Kimmo Kaitila Oy

Leca products used Leca® Aggregate



ECONOMIC LIGHT WEIGHT FILLINGS WITH LECA®

FINLAND *Lightweight fillings made from Leca® aggregate turned out to be the most economical and safest method for reducing settlements, as well as the safest when constructing school roads on clay soils.*

Text & photos: Sampsa Heilä

Thanks to the new access roads and light traffic lanes, the school road to Parkkoja School in Pornainen will be safer when the school year starts again in August.

– The soil at the construction location is, to a large extent, soft clay, the layer thickness of which ranges from five to ten metres. When the location must be filled in to a level higher than the current one, the greater loads are sensitive to the creation of settlement and stability problems. Therefore, a decision was made to use light weight fillings made from Leca aggregate, in order that the burdens experienced by the soil can be reduced and, consequently, the settlement and stability controlled, says project manager, M.Sc. Tuomas Kärki from Sipti Infra Ltd.

The company has participated as a chief designer in geoengineering projects, as a subcontractor for FCG Suunnittelu ja tekniikka Ltd.

Multi-functional light filling material

– In choosing the method of load compensation, the costs and overall economic considerations tend to dictate the final decision, which in this case was a light filling made from Leca aggregate. In addition to the building of roads and streets on unstable weak soil, we have also used it for the foundations of pipelines and the light filling of construction sites for houses, for example, along the walls of buildings, where settlements are expected. In this case, Leca aggregate also serves as frost insulation, says Tuomas Kärki.

The general contractor for the project, launched in October, is Ralf Ajalin Ltd.

– Approximately 15,000 cubic metres of clay was removed and new soil materials of a slightly greater volume are to be brought to the work site. In addition, over 2000 cubic metres of Leca aggregate are to be

used for the light filling at the location of the pipelines and other places, where the clay is soft. Settlements grow unduly large, if only heavy aggregate is used for construction on top of the soil, says site manager Stig Wikström from Ralf Ajalin Ltd.

Endures heavy loads in compacted form

Leca aggregate layer is three metres at its thickest. In road construction, due to the high loads, Leca aggregate is compacted in 30 cm layers, and sufficient compaction is ensured with measurements.

– Co-operation with this school of more than 200 students, located next to the construction site, has gone very well. It is a great thing that the municipality wants to make a safer school road for the children, says Stig Wikström.

Leca® aggregate layer is three metres at its thickest



Compaction of Leca was quick and easy to do with a track base excavator.

Even on a thick layer of Leca, working with the excavator was easy and efficient.

Leca® facts

Client Municipality of Pornainen

Main Contractor Ralf Ajalin Ltd

Chief designer FCG Suunnittelu ja tekniikka Ltd

Geoplanning/ relief structures Sipti Infra Ltd

Leca products Leca® Aggregate



RECYCLED ATMOSPHERE

FINLAND *In Lahti, Leca® aggregate was used in a library's interior landscaping. Leca aggregate was removed during roof renovations of a commercial building in Helsinki, and then used, after further processing, as roof soil for green roofs.*

Text: Sampsa Heilä & Päivi Tötterman
Photos: Arja Rantasalo & Leca Finland

Creating the atmosphere with interior landscaping

The interior landscaping of Lahti main library was renewed as part of the full renovation of the library. The old planting tanks were emptied of stones and new plants were planted to emphasize the spirit and atmosphere of this prestigious library.

Arja Rantasalo from interior landscaping company Canto Verde was responsible for the planning and building of the new landscape. In the planning phase it was important to consider the client's wishes, the overall space, the planting tanks and the different ways to leverage these key wishes. The shallow sections of the planting tanks, approximately 25 cm deep, made it possible to use hydroponics instead of traditional soil planting. In hydro planting a combination of Leca aggregate and water will be the substrate for the plants.

Cellular and lightweight aggregate creates an easy, water retaining and clean substrate for different kinds of plants.

In total, 7 cubic metres of Leca aggregate was delivered for the library's interior landscaping. This amount was enough for the planting and also for possible future maintenance.

From roof to recycle

Leca aggregate was removed during roof renovations of a commercial building in Helsinki, and then used, after further processing, as roof soil for green roofs.

Leca aggregate, produced through the burning of natural clay, is a fully recyclable material.

– In roof renovations, the old roof is dismantled and a layer of Leca aggregate, on average 400 mm thick and acting as heat insulation,

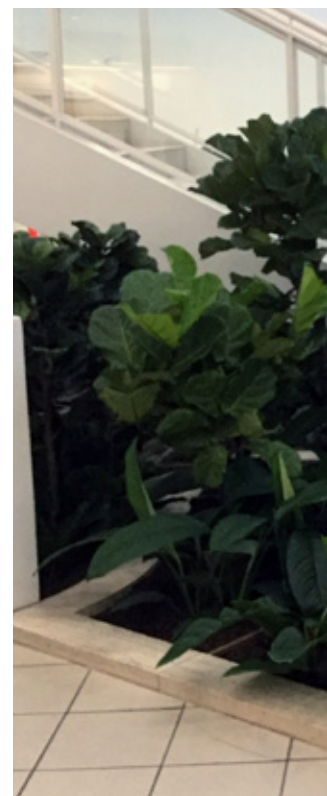
is removed and delivered as a raw material for use in roof soil. A vapour barrier is installed onto hollow-core slabs, as well as Leca aggregate and 250 mm mineral wool. Leca aggregate ensures adequate ventilation of the roof and it is simple to construct inclinations leading to roof drains, says Lasse Ruuskanen from Eristysmestarit Ltd, supervisor for the renovation of a commercial building located in Herttoniemi, Helsinki.

Leca aggregate is removed from the roof and transported away by Anpe Ltd.

Lightweight and helps the water supply of plants

Leca aggregate removed from a roof is delivered to Ralf Ajalin Ltd's Pihamaa service and soil station in Vantaa.

– Leca aggregate is crushed and it is used as an important part of the





Arja Rantasalo makes sure that the tanks are water proofed before adding Leca aggregate and water.



The interior landscaping of the library's main hall was done using hydroponics by utilising Leca aggregate and water.

Leca aggregate, produced through the burning of natural clay, is a fully recyclable material.

“The share of recycling is growing all the time. Of recycled Leca aggregate, about 80 percent is used in geo application and 20 percent for other uses.” says Hannu Pesola, ANPE Ltd’s managing director.



manufacturing process of roof soil. Compared to normal soil, roof soil as a product has been processed for longer and is a more valuable specialty product, says Olli Mannerjoki, from Ralf Ajalin Ltd, responsible for Pihamaa-service products.

– Crushed Leca aggregate

allows the soil to be much lighter, so that roof structures are not placed under excess loads. The main purposes of Leca aggregate in roof soil are to make the soil light, and to improve the movement of water in the growth base, which facilitates access to water for plants.

Leca® facts

Client Eristysmestarit Oy

Main contractor Anpe Ltd & Ralf Ajalin Ltd

Leca products Leca® aggregate



HOUSES OF THE BOUÇA*

PORTUGAL *The need to transform into opportunity the setbacks imposed by the economic crisis throughout the construction process*

Two houses were built for two couples (brothers) in a “bouça” - one was designed for the daily life of one couple, the other for reunions of the extended family on festive occasions. Both are organized around several covered and uncovered courtyards that establish transitions between the interior and exterior of the house. The overall units are constructed using a concrete structure and lightweight masonry (Bloco Térmico®) exterior, overlaid with acoustic

correction boards in lightweight concrete (Mursom®). For the patios, different materials were used - wood, brick, tile, metal plate and lightweight concrete - responding to the various needs and functions as well as exploring diverse sensory experiences - light, tactile, and, especially, sonorous and olfactory.

The two units that make up the houses extend across a single floor, creating a very compact impression with few openings. This aspect is

emphasized by the texture of the outer covering, which contrasts with the verticality of the pre-existing trees, whose location influenced the siting of the units and in part inspired the existence of some of the patios. The plan of each of the houses was specifically defined according to the sense of each family’s experiential representation, goals and needs.

The period of construction of the houses was marked in Portugal by the beginning of the economic

*Bouça: delimited terrain where the forest develops, space of transition between cultivated fields and the forest.



The texture of the outer covering contrasts with the verticality of the pre-existing trees.

The houses extend across a single floor, creating a very compact impression - with few openings visible.

This project ran for the Mie Van Der Rohe Prize in 2015

and financial crisis, an aspect that indelibly marked the whole process, in terms of both the organization of the project, and the choices and possibilities for the design.

In the execution phase of the project, which is now necessarily open, all those involved - designers, architects and clients - have contributed with a common objective, to maintain the feasibility of the work. The adjustment of the project and its construction to the available conditions and means of production was understood by us as an opportunity to exploit the knowledge and quality of the workforce we had. By way of

example, the exposed brick and the concrete slabs were produced entirely on site; mortars were made up from several types of local / regional raw materials, in order to adjust the consistency, aspect and color. In some ways we consider that with this work, the circumstances of the crisis gave us an opportunity to highlight one of the aspects still relevant today in construction in Portugal - the quality and inventive capacity of its workforce!

In the available 2,622m² of land area, it was possible to build the two houses with 277 m² and 366 m² of covered area, guaranteeing a cost of €550 per square metre.



MIES ARCH
European Union Prize 2015
nominated work

This project was entered for the Mie Van Der Rohe Prize in 2015.

The project creates a central element, around which the social spaces are generated.

Leca® facts

Project Bouça das Cardosas Houses

Location Paredes de Coura, Portugal)

Authors Filipa Guerreiro and Tiago Correia, architects

Leca products Bloco Térmico®, Mursom®



WALLS IN PUBLIC BATHS

SWEDEN *Leca® Blocks provide solutions for walls in public baths. The climate requires the walls to meet high functionality standards for moisture and mechanical resistance.*

In public baths, the demands for moisture resistance are high. With Leca Blocks the result was durable interior walls and decorative masonry that contributed to a lovely bathing experience for guests. A meandering wall separates the big pool from the children's water park. Lined up at the poolside is a school class, waiting for the signal to jump into the water.

Popular activity centre

The adventure baths are a popular new activity centre in the region. Joyous laughter echoes around the open premises when Krister Nyman, marketing manager for Leca Blocks, is showing visitors around. The curved wall is an example of the use of Leca

Block 95 in the construction. Even the approximately 10-metre high interior wall, which extends past the second-floor gym and up to the roof, has been built with Leca Block 125 by masons from Johns Bygg & Fasad. The company is a certified partner and the masons are trained in the systems of Weber Saint Gobain.

– For us, the builder Peab, and the customer Vara Municipality, trained and certified masons guarantee good construction. It is important that we know that the walls have full functionality in such a large project as this, says Krister Nyman.

Moisture resistance is crucial

In a bathhouse, the demands on

moisture resistance are high. Therefore Leca Blocks were selected as a material for the interior walls.

– For wet-room walls Leca Block 125 are the perfect solution. They are robust, with good resistance against fire and moisture. In the long term, the materials are low-maintenance and provide a comfortable room temperature, says Krister Nyman.

Water splashes against the walls when the kids are dive bombing into the pool. The air is warm and moist. At the end of the sinuous wall candles are burning in a large chandelier. One long side wall consists of a window that fills the room with morning light.



Krister Nyman, marketing manager in Leca

The curved wall is an example of the use of Leca Block 95 in the construction.

Locker rooms, showers and the inner wall of the corridor towards the exit have been built with Leca.



A block for creativity

Pål Warolin CEO of Johns Bygg & Fasad talks about the masonry work while we stroll past the three children's pools decorated with sculptures of a giraffe, dolphin and a frog.

– We designed the masonry to imitate natural stone, both the curved wall and also the interior walls of the bathhouse and changing rooms, says Pål Warolin and continues: – You can build with masonry at all possible angles with Leca Block. We can cut them and create most shapes you could want. In other words, the architects can be more creative and think about more than just right angles when they chose Leca. – Leca is quick to build with. Since the blocks

come in different sizes depending on where they are meant to be used, the product is easy to work with, says Pål Warolin. According to him, the great advantage that it is easy to work with the product and easy to train staff to use it. – Traditional masonry is more difficult. Masonry with Leca is quick to learn and the system minimizes the risk of errors.

Even the locker rooms, showers and the inner wall of the corridor towards the exit have been built with Leca. The result, bathers notice, is a welcoming atmosphere in a bathhouse that offers splashing wet experiences for both young and old.



Leca® facts

Object Vara Äventyrsbad

Town Vara

Building year 2014 (construction carried out January 2013 - September 2014)

Builder Vara Kommun

Main Contractor Peab

Supervisor Urban Sjöström

Sub Contractor Johns Bygg & Fasad
AB Architect: ABAKO arkitektkontor AB

Designer R&H Byggt teknik

Leca Products Leca® Block 95,
Leca® Block 125

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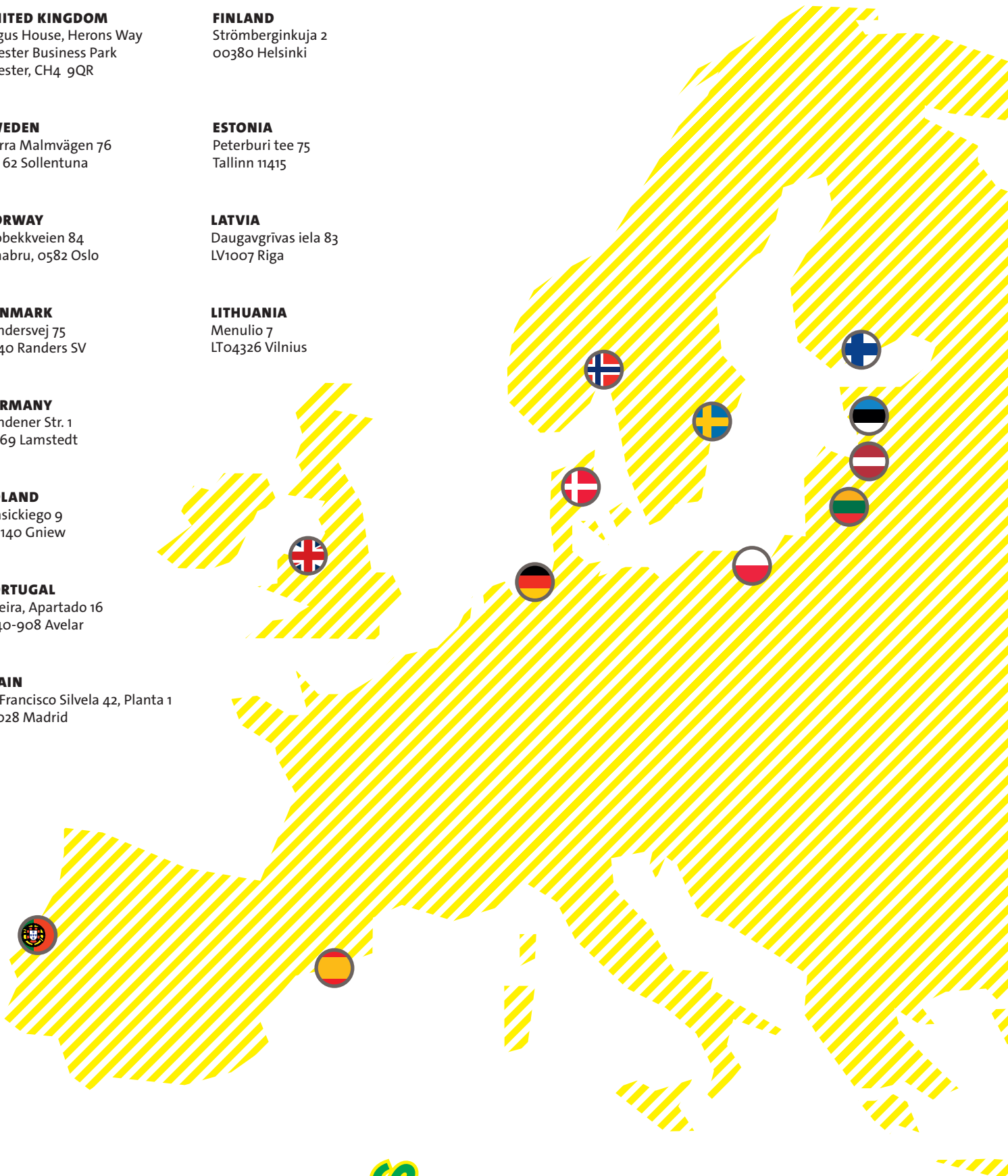
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