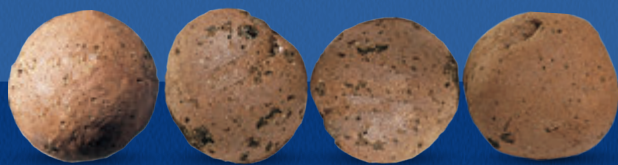




*Leca*<sup>®</sup>

Light Expanded Clay Aggregate







# Leca<sup>®</sup>

Light Expanded Clay Aggregate

The letters LECA stand for Light Expanded Clay Aggregate. Expanded clay aggregates are porous ceramic products with uniform pore structure of fine, closed cells and with densely sintered, firm external skin. It is manufactured in rotary kilns from raw material containing clay minerals. The raw material is prepared, moulded and then subjected to a firing process at temperature between 1100 and 1200 °C, is expanded which results significant increasing in volume. LECA pebbles internal cellular structure with thousands of air-filled cavities gives **thermal** and **sound insulation** properties.

Expanded clay was developed in 1917 in Kansas City, Missouri, as Hydite, and it was also produced in European countries with different names. We are producing LECA since 1979 and exporting to many countries such as, Australia, Bahrain, India, Iraq, Kuwait, Malaysia, Qatar, Saudi Arabia, Singapore, South Africa, South Korea, UAE, Vietnam, etc ... .

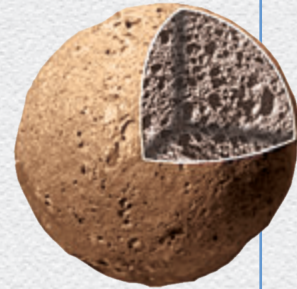




## Leca Main Advantages

LECA aggregate advantages which make every Leca Product a unique building material.

- LIGHTNESS
- THERMAL INSULATION
- SOUND INSULATION
- FIRE RESISTANCE
- NON-DECOMPOSABILITY
- LIMITED WATER ABSORPTION



## Leca Wide Applicability

	Average Density* kg/m <sup>3</sup>	Leca Gradation mm
Leca Light Weight Concrete, Light Weight Block, Prefabricated Panels & Slabs. Light Filler, Leca Mortar and Water Purification System. Agriculture & Aquaculture.	510	0-4
Light Weight Concrete, Light Weight Block, Prefabricated Panels & Aquaculture, Ornamentation.	320	4-10
Light Weight Filler Concrete, Sewage System. Landscaping, Agriculture & Aquaculture, Drainage.	250	10-25
Floor & Roof Sloping, Light Weight Filler, Road Construction.	270	0-25

\*Average density allowable tolerance is  $\pm 50$  kg/m<sup>3</sup>



Leca 0.1-4 mm



Leca 4-10 mm



Leca 10-25 mm





## Light Weight Concrete (LWC)

Structural or non-structural lightweight concrete can be defined as a concrete with closed or open structure contains both ordinary aggregate and LECA aggregate. In addition to the weight saving, lightweight concrete has substantially better fire-resistant qualities, lower heat transmission, remarkable moisture resistance and more durability than normal weight concrete. It protects steel reinforcement from the corrosive reaction, salt water and severe environmental conditions.

Structural Light Weight Concrete (SLWC ) has offered a wide range of applications and possibility design tall building frames, long-span roofs and bridge structures and thin shell construction.

Lower weight helps in reduction of (seismic forces, reinforcing and pre-stressing steel) while increasing live load capacity for **Bridges** and **Marine Structures**. Moreover, with Low permeability, it is highly **Durable** to freezing and thawing and chloride ions. Owing to LECA long term water absorption, LECA acts as an internal source of water for **internal Curing (IC)** which helps to avoid shrinkage and improves long term strength.



▲ Exterior of 40,000-seat Wellington Stadium NZ nearing completion, 4000 precast lightweight components accommodated rapid construction

▲ Hibernia Offshore Platform Canada



## Screed, Flooring and Roofing

Designers apply lightweight concrete for floors and roofs because in order to be cost efficient and environmentally friendly. While Lightweight concrete has compressive strength same as normal weight concrete. It will reduce total dead load up to 30 percent and provides 5 times more thermal insulation.

Leca makes a smart package of lightweight elements, thinner section, better fire rate, insulating roof, improved seismic structural response, less reinforcing and lower foundation cost.



## Lightweight and Insulating Grout

LECA mortar is type of premix of light weight concrete which can be used for roof insulation, cover steel member to protect against fire and corrosion, and also for block work to decrease more weight per square meter and increase the thermal and sound insulation.

LECA mortar is made of cement, additives and small size of Leca aggregate (0.1 mm to 4 mm) which has dry density 1000-1300 kg/m<sup>3</sup> with 8 MPa Compressive strength.

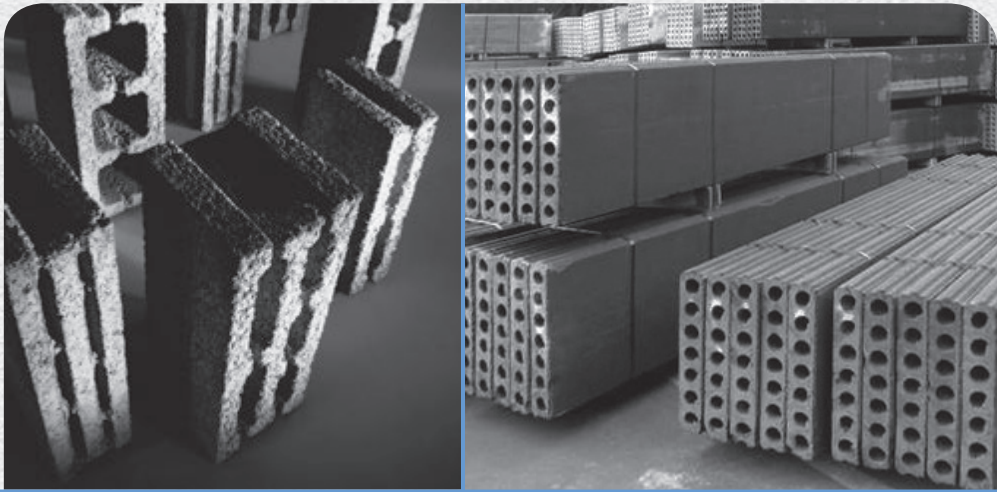




## Lightweight Precast Elements and Masonry Units

LECA is the raw material for many prefabricated components. Leca blocks, prefabricated panels, Lightweight brick, Artificial Stones, Floor Tiles, Wall Tiles and pavement are all well-known products which have advantage of lightweight, moisture resistance, fire resistant, sound insulation and thermal insulation.

LECA precast elements and Masonry Units are construction accelerator, time, labor and material saving. LECA building blocks are solid or hollow blocks of lightweight aggregate concrete. The base product is LECA.



### LECA building blocks Properties

LECA building blocks are produced by mixing LECA with cement, sand and water.

Blocks are cast in normal block making machines that compact and vibrate the concrete in one single operation.

LECA block is ideal for all types of exterior and interior walls, and suitable for any physical operation such as cutting, nailing, transfixing or screwing, also ridge extending to make proper route for wire, pipe and other installing components without any cracking on the material surface. It has all workability of normal block and doesn't have any limitation of other lightweight blocks.



**Light and Rigid:** LECA building blocks have compressive strength of 2.0-3.5 MPa as per American and European standards with a normal dry density of 600-800 kg/m<sup>3</sup>.

**Thermal insulation:** LECA aggregate insulates with low thermal conductivity (approximate 0.09 W/m.k) could be used in many products (such as Block, grout...) to increase thermal resistance of products. Leca does not deteriorate at time, so it is perfect basic material to be used in the creation of permanent thermal insulation elements. Despite of other lightweight and insulating materials with up to 80 percent water absorption, LECA water absorption is limited to 18 percent of its weight which means that its thermal conductivity will not increase due to moisture content. The accumulation of heat in inner-leaf walls and partitions made of LECA building blocks make a major contribution to the creation of a pleasant indoor climate by neutralizing temperature fluctuations by sunshine or ventilation.

**Sound Insulation:** With advanced acoustic specifications, Leca sound insulation goes beyond other building materials. Sound insulation of a one layer leca block wall will ranges from 46 to 53 db which is appropriate for all kind of building functions.

**Fire resistance:** LECA building blocks are non-combustible building material and classified as reaction to fire Euro class A1 (no contribution to fire).

**Re-Shaping:** The best tool for dividing and reshaping the LECA building blocks is a carbide-toothed saw. Minor jobs can be accomplished using an axe or masonry hammer.

**Surface treatment:** The low moisture absorption and large surface pores made LECA blocks suitable for rendering and plastering with both manual and mechanical methods. LECA plaster has great advantages in outer and inner walls.

**Inorganic:** LECA building blocks are inorganic and not susceptible to attack by dry-rot, wet-rot or insects.

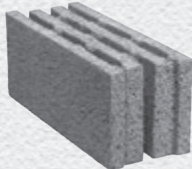
**Minimum water absorption:** The moisture absorption of LECA blocks is minimum as per lightweight block standards. As the block structure consists of large pores which result in an effective protection against water capillary.



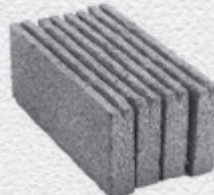




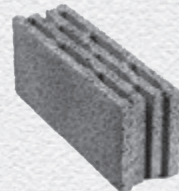
Size: 49x17.5x20  
Max. Weight: 12 kg  
Sound Resistance: 50 db



Size: 49x19x20  
Max. Weight: 12.8 kg  
Sound Resistance: 53db



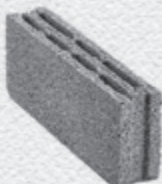
Size: 49x25x20  
Max. Weight: 17 kg  
Sound Resistance: 54db



Size: 49x14.5x20  
Max. Weight: 11.2 kg  
Sound Resistance: 51db



Size: 49x19x20  
Max. Weight: 12 kg  
Sound Resistance: 47 db



Size: 49x10x20  
Max. Weight: 7.5 kg  
Sound Resistance: 47 db



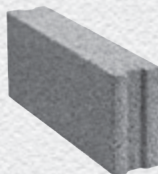
Size: 49x14.5x20  
Max. Weight: 10.7 kg  
Sound Resistance: 49 db



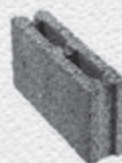
Size: 49x12x20  
Max. Weight: 9.2 kg  
Sound Resistance: 49 db



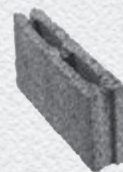
Size: 49x8x20  
Max. Weight: 7.2 kg



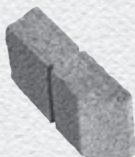
Size: 49x10x20  
Max. Weight: 9.5 kg  
Strength: 45kg/cm<sup>2</sup>



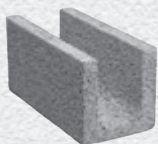
Size: 40x10x20  
Max. Weight: 5.5 kg  
Sound Resistance: 46 db



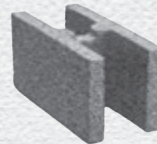
Size: 40x7x20  
Max. Weight: 3.7 kg  
Sound Resistance: 46 db



Size: 40x10x20  
Max. Weight: 8 kg



Size: 40x19x20  
Max. Weight: 7.1 kg  
Strength: 20kg/cm<sup>2</sup>



Size: 40x19x20  
Max. Weight: 8 kg  
Strength: 20kg/cm<sup>2</sup>



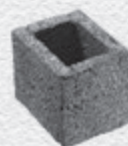
Size: 49x14.5x20  
Max. Weight: 9.5 kg  
Sound Resistance: 46 db



Size: 20x5x10  
Max. Weight: 1.1 kg



Size: 20x10x20  
Max. Weight: 4 kg



Size: 24x19x20  
Max. Weight: 5.7 kg



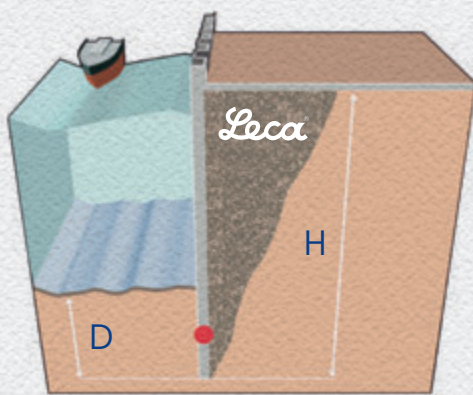
Size: 24x14.5x20  
Max. Weight: 4.7 kg



## Geotechnical and Filling Application

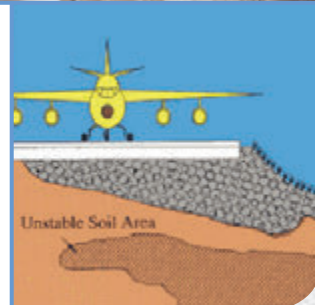
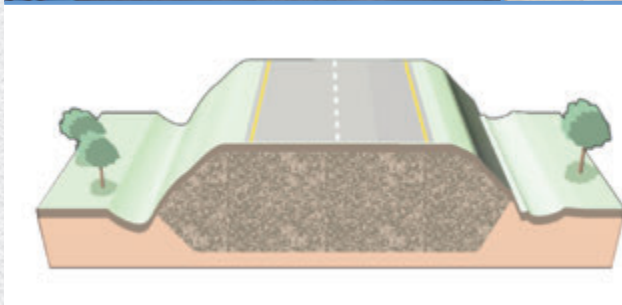
Lightweight aggregate reduces approximately half weight of common filling, this advantage coupled with its predictable high internal friction angle LECA aggregate will reduce lateral forces to avoid potential sliding, overturning, slip, tilting or bearing failures.

Moreover it will optimise structural dimensions, control settlement on road tunnel or filling on top of slabs, stabilization of sides or filling underground cavities and finally controls water level and drainage of water surface.



It has been effectively used to solve numerous geotechnical engineering problems and to convert unstable soft soil into usable land. Lightweight fill also provides permanent non-degradable insulation around pipe lines, and other thermally sensitive elements.

LECA is lightweight filling material for filling in foundations, retaining walls, road embankments, query extensions and insulation layer.

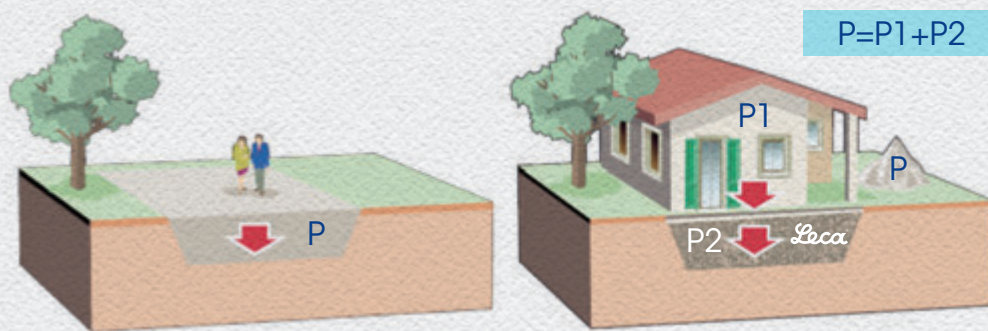




## Geotechnical and Filling Application

### Main Advantages:

- **Stability:** reduced risk of landslide and deformation
- **Reduced settlement:** less damage to road structures, rail beds, pipelines and other structures
- **Reduced earth pressure:** in structural backfill against foundations, retaining walls and bridge abutments
- **Drainage:** on sports grounds, fields, slopes and roads
- **Insulation and drainage:** protection for pipeline



## Green Roof & Horticulture

Expanded Clay LECA plays a valuable role in today's horticulture, Green Roof and landscape design.

From innovative, cost-effective, long-term solutions to modern horticulture and landscape design challenges, professional designs have turned to lightweight LECA products. Whether it is creating an ideal planting media for a rooftop garden, designing a soil for an athletic field or improving an existing soil to sustain a plant design, LECA is the logical solution.

Environmentally friendly LECA aggregate in green roof design helps address important issues such as managing storm water runoff, improving water quality, reducing trucking requirements, minimizing the impact on soil structures, reducing urban heat, conserving energy, helps to fast growing, feeding air/oxygen to the plant's roots, decreasing dead load the structural elements, increasing green space. Absorptive Porous characteristics provide critical soil aeration necessary for plant growth and survival.





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