

Leca[®]

Light Expanded Clay Aggregate



LECA Building Material Trading LLC



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Leca is initial letters for light expanded clay aggregate. Expanded clay aggregates are porous ceramic products with a uniform pore structure of fine, closed cells and with a densely sintered, firm external skin. It is manufactured in rotary kilns from raw materials containing clay minerals. The raw material is prepared, moulded and then subjected to a firing process at temperatures of between 1100 and 1200 °C, resulting in a significant increase in volume due to expansion. The LECA grains internal cellular structure with thousands of air-filled cavities gives **thermal** and **sound insulation** properties.

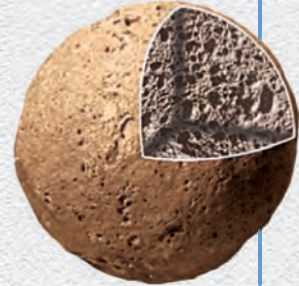
Expanded clays were developed about 1917 in Kansas City, Missouri, which is known as Hyalite, and also available in Europe countries with different names. We are producing LECA since 1979 and exporting to many countries such as, UAE, Saudi Arabia, Bahrain, India, Qatar, Malaysia, Vietnam, Iraq , South Korea, Singapore.



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 ³	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 ± 50 kg/m³



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 whole or part ordinary aggregate and LECA aggregate.

In addition to the weight savings, lightweight concrete has substantially better fire-resistant qualities than normal weight concrete, significantly lower heat transmission, remarkable moisture resistance and more durability. It protects steel reinforcement from the corrosive action, salt water and severe environments.

For architects and engineers, Structural Light Weight Concrete (SLWC) has opened up a wide range of applications and possibility to have tall building frames, long-span roof and bridge structures and thin shell construction.

Lower weight reduces seismic forces, reinforcing and pre-stressing steel, increase 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 will act as an internal source of water for **internal curing** which will help to avoid shrinkage and improve 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 specify lightweight concrete for floors and roof because it is expected to be cost effective and environmentally efficient. While Lightweight concrete has compressive strength comparable to normal weight concrete and screed. It will reduce total dead load up to 30 percent and provides 5 more times 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. LECA use assures all necessary essential factors for comfort, during summers or winters.



Lightweight and Insulating Ready Mix

Leca mortar is a kind of premix light weight concrete which can be used for several applications such as roof insulation, cover steels member to protect against fire and corrosion, and use for block work to decrease more weight per square meter and increase the thermal/sound isolation.

Leca mortar is made by cement, additives and small size of Leca aggregate (0.1 mm to 2 mm) which has dry density 1000-1300 kg/m³ with 8 MPa Compressive strength. Leca white or gray plaster in fine or coarse types are produced which adds all Leca advantages including internal curing and crack prevention to the cement plaster.



Lightweight Precast Elements and Masonry Units

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

LECA Precast Elements and Masonry Units is a 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. The 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 surface material. It has all workability of normal block and doesn't have any limitation of other lightweight blocks.

Light and Rigid: LECA building blocks are supplied in block compressive strength class of 2.0-3.5 MPa as per American and Euro standard with a normal dry density of 600-800 kg/m³.

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 owing 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 superiors other building material. Sound insulation of a one layer leca block wall will range from 46 to 53 db which is appropriate for all kind of building functions.

Fire resistance: LECA building blocks are non-combustible and to be considered as reaction to fire class A1 (no contribution to fire).

Shaping: The best tool for dividing and shaping the LECA building blocks is a carbide-toothed saw. Minor jobs can be accomplished using an axe or masonry hammer. LECA blocks are quickly divided using a standard block cutter.

Surface treatment: The low moisture absorption and large surface pores made LECA blocks suitable for rendering and plastering by both manual and mechanical means. LECA plaster including Leca superiors 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.

Minimal water absorption: The absorption of moisture by LECA building blocks is minimal and as per standards. The block structure with large pores between the LECA, gains forms effective protection against sorption.



Dimensions

The block thickness and corresponding block weight is according to the table.



Size: **40x12x20**
Max. Weight: **9.2 kg**



Size: **49x19x20**
Max. Weight: **11.5 kg**



Size: **49x17.5x20**
Max. Weight: **12 kg**



Size: **40x19x20**
Max. Weight: **9.6 kg**



Size: **49x14.5x20**
Max. Weight: **9.2 kg**



Size: **40x10x20**
Max. Weight: **5.5 kg**



Size: **20x5x10**
Max. Weight: **1.1 kg**



Size: **40x8x20**
Max. Weight: **5.9 kg**



Size: **40x10x20**
Max. Weight: **7.5 kg**



Size: **24x19x20**
Max. Weight: **5.5 kg**



Size: **24x14.5x20**
Max. Weight: **4.5 kg**



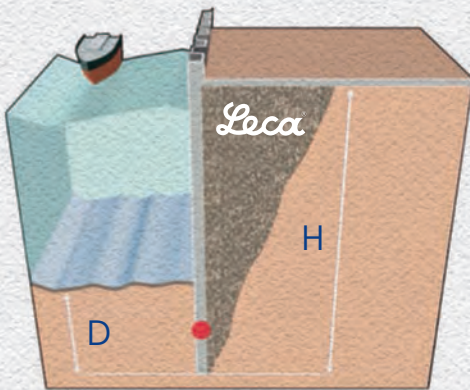
Size: **20x10x20**
Max. Weight: **4 kg**

The Block weight is the average weight including normal humidity content.

Geotechnical and Filling Application

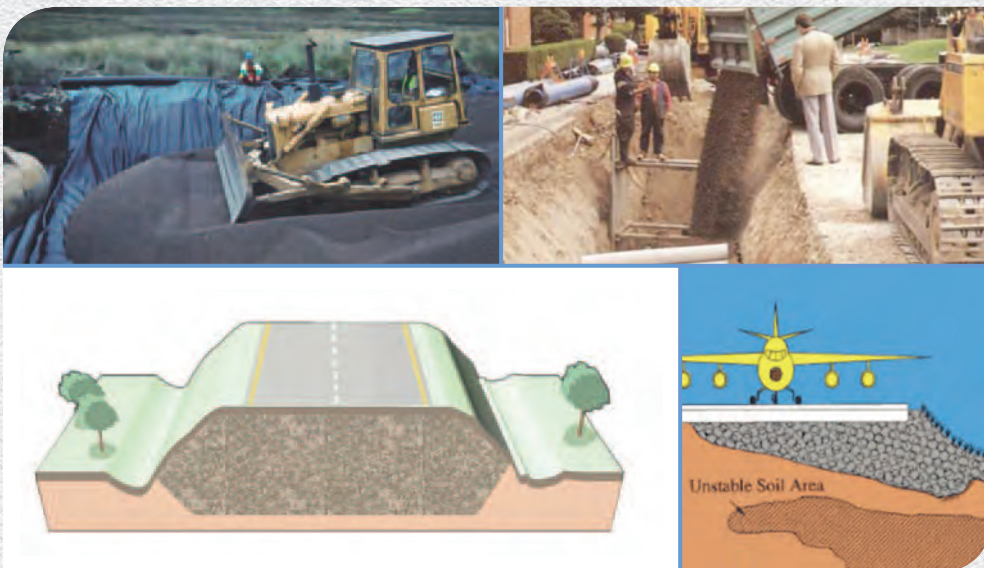
Lightweight aggregate (Leca itself or LWC) reduces approximately half weight of common filling, this advantage coupled with its predictable high internal friction angle LECA aggregate will reduce lateral forces to avoid potential sliding, overturning, slip, tilting or bearing failures.

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 control water level and drainage of surface water.



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.

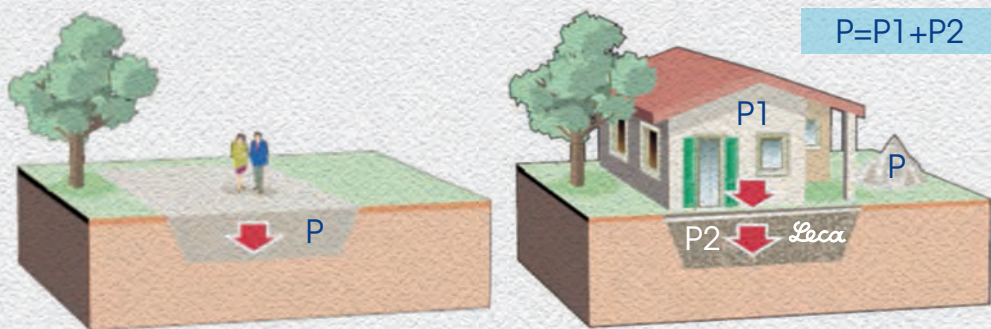
LECA is lightweight filling material which can solve many problems simultaneously, providing simple solutions to civil engineering challenges.



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

LECA plays a valuable role in today's horticulture, Green Roof and landscape design. For innovative, cost-effective, long-term solutions to modern horticulture and landscape design challenges, design professionals have turned to LECA. 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, fast growing, unique feeding air/oxygen to the plant's roots, lowering dead load the structural elements, increasing green space. Absorptive and porous characteristics provide critical soil aeration necessary for plant growth and survival.



Agriculture, Landscape and Garden

LECA's porous micro-surface texture and interior porous structure resist clogging and provides superior aeration that promotes growth of delicate, fine root systems. LECA is produced by high temperatures which it makes LECA sterile and environmentally inert. Chemically is neutral and not harmful, non-toxic, highly absorptive ceramic granule, dimensionally stable and will not degrade or compress like other amending products.

LECA does not need to be re-applied year after year. LECA is combined with peat, sand and other amendments to form root zone soil mixes for golf courses, athletic fields, gardens and related turf surfaces. It is also applied as topdressing over established turf.

Leca is used as a drainage layer in gardens on flat coverings (underground garages or hanging gardens, flower boxes). Leca are used in the soil substrate layer and in the drainage layer to create hanging gardens with or without water reservoirs for extensive or intensive substrates or hydrated substrates.





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