Laterlite Expanded Clay is a lightweight aggregate made by expanding special natural clays at high temperature (1200°C). It is supplied either as granules in a range of sizes or as a crushed version, with a peculiar set of characteristics.

**CHARACTERISTICS**

**Lightweight, insulating, strong**
Its porous internal structure means it is lightweight (from approx. 320 kg/m³), thermally insulating (from lambda \( \lambda \) 0.09 W/mK), and sound-absorbent. The ceramic “clinkered” outer shell surrounding the granules makes them very hard and resistant to compression (up to 12 N/mm).

**Non-combustible and fire-resistant**
This is a 100% mineral non-combustible product (Euroclass fire rating – A1) that is fire-resistant and safe, including in the presence of fire. It is commonly used in refractory applications.

**Extremely stable and durable**
It will not rot, cannot be attacked by parasites (fungus, rodents, insects, etc.), is resistant to acids, bases, solvents, and freeze-thaw cycles, is dimensionally stable and non-deformable, and retains its properties unaltered over time; for all practical purposes this material will last forever.

**A natural material for sustainable construction**
The natural raw materials used in Laterlite Expanded Clay, its manufacturing process that respects the environment, and the total absence of harmful emissions (even in the presence of fire), make it ideal for sustainable construction as certified by ANAB-ICEA, the Italian Accreditation Institute.

**Versatility**
Laterlite Expanded Clay is used extensively in construction, both loose on its own or mixed with binders (cement, lime, resins, etc.). It is widely used as a component of concretes, in blocks and precast elements, for agricultural and horticultural applications, and in geotechnical engineering and infrastructure works.

**High drainage capacity**
Because of its granular nature, which consists of a dense network of intergranular voids with high drainage capacity, it can be used to create lightweight drainage layers of high strength.

**CE-marked**
It is manufactured and tested in accordance with international reference standards, and is CE-marked to denote conformity to EN 13055-1, EN 14063-1, and EN 13055-2.
TYPES

GRANULAR
Laterlite Expanded Clay in granular form optimises the relationship between weight, lightness, and insulating ability. The characteristic spherical granules come in a wide range of sizes (denominations 0/2 – 2/3 – 3/8 – 8/20).

CRUSHED
Laterlite Expanded Clay can also be supplied in crushed form, in a range of sizes (denominations 0/2 FRT, 0/4 FRT and 2/4 FRT) suitable for use as a component in some lightweight concrete (e.g. for lightweight blocks and refractory products) and wherever there is a need for a lightweight fine material that has good insulation characteristics.

STRUCTURAL
We use a particular manufacturing process to obtain a special type of expanded clay that has a denser and porous internal nucleus and a thicker, more tenacious ceramic “clinkered” external shell of particularly high compressive strength. Structural Laterlite Expanded Clay is available in a range of sizes (denominations 0/5 – 5/15 – 5/15) for use as a component of lightweight structural concrete mixes and for all applications where particularly good mechanical performance is required.

DRY
All the standard versions of Laterlite Expanded Clay normally contain a varying percentage of humidity but on request, can be supplied dry (humidity approx. 1%). Expanded clay can also be manufactured as the Laterlite Plus variant, which is dry and hydrophobic Laterlite Agri.

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>LATERLITE EXPANDED CLAY</th>
<th>Granular</th>
<th>Crushed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denomination *</td>
<td>0/2</td>
<td>2/3</td>
</tr>
<tr>
<td>Density in kg/m³ [approx.] **</td>
<td>680</td>
<td>480</td>
</tr>
<tr>
<td>Resistance to granule fragmentation N/mm² **</td>
<td>≥ 5,0</td>
<td>≥ 3,0</td>
</tr>
<tr>
<td>Thermal conductivity λ, W/mK</td>
<td>0,12</td>
<td>0,10</td>
</tr>
<tr>
<td>Reaction to fire</td>
<td>Euroclass fire rating – A1 (non-combustible)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>LATERLITE DRY EXPANDED CLAY</th>
<th>Granular</th>
<th>Crushed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denomination *</td>
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<td>2/3</td>
</tr>
<tr>
<td>Density in kg/m³ [approx.] **</td>
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<td>440</td>
</tr>
<tr>
<td>Resistance to granule fragmentation N/mm² **</td>
<td>≥ 5,0</td>
<td>≥ 3,0</td>
</tr>
<tr>
<td>Thermal conductivity λ, W/mK</td>
<td>0,12</td>
<td>0,10</td>
</tr>
<tr>
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<td></td>
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</tbody>
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<table>
<thead>
<tr>
<th>STRUCTURAL</th>
<th>Granular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denomination *</td>
<td>0/5</td>
</tr>
<tr>
<td>Density in kg/m³ [approx.] **</td>
<td>720</td>
</tr>
<tr>
<td>Resistance to granule fragmentation N/mm² **</td>
<td>≥ 12,0</td>
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<tr>
<td>Thermal conductivity λ, W/mK</td>
<td>0,12</td>
</tr>
<tr>
<td>Reaction to fire</td>
<td>Euroclass fire rating – A1 (non-combustible)</td>
</tr>
</tbody>
</table>

Refer to the Technical Data Sheet and the Safety Information Sheet.

* "Denomination" means the commercial denomination of the product. It does not refer to the diameter in mm of the Laterlite Expanded Clay granules.

** The densities and strengths given are indicative averages based on annual production checks at each manufacturing unit and may deviate by ±15% as permitted by European Standard EN 13055-1. On request, Laterlite Technical Support can provide Product Data Sheets that are produced by each manufacturing unit. These give the most detailed and up-to-date information.

For specific applications that use denominations 0/2, 2/3 of Laterlite Expanded Clay and denomination 0/4 of Laterlite Plus in components that are intended to remain visible, particular measures have to be taken (contact Laterlite Technical Support).
Support
The bearing layer must be clean, solid, stable, free of cracks, discontinuities or loose parts. Any services previously laid on the bearing layer must be adequately protected and distanced. If the product is to be spread on the ground, a separating layer (e.g. geotextile) must first be laid.

APPLICATION METHODS

1 - Loose application
In order to exploit to the full the insulating and lightness characteristics of Laterlite Expanded Clay, the material should be laid loose and simply levelled to the thickness desired. If the top surface is not to be walkable it can be left as it is. If it is to be accessible or walkable or if a sur-face finish, such as an impermeable layer or paving, is to be applied, it must be covered with a layer of another material (a screed, a floor slab, various types of panel, or plant growth soil), incorporating separation layers if required. N.B. the space to be filled with Laterlite Expanded Clay must be adequately contained at the sides.

2 - Surface bonding with cement slurry
The topmost granules of a layer of loose Laterlite Expanded Clay can be fixed with a cement slurry to make the surface easy to walk on for completing the job (by adding a top slab, a screed, etc.). The cement slurry (a mixture of cement and water) should be spread over the surface of the loose Laterlite Expanded Clay after it has been levelled.
By varying the proportions of water and cement (w/c), the slurry can be made more or less fluid and will penetrate to a greater or lesser depth into the layer of expanded clay. The suggested approximate w/c ratio is 0.8 (equivalent to 1 no. 25 kg bag of cement + 20 litres of water).

3 - Binding with cement
No fines concrete ( pervious concrete, open-pore structure)
Laterlite Expanded Clay binds easily with cement to give a light-weight insulating permeable concrete with better mechanical strength as compared to the loose product.

Typical formulation per m$^3$:
• 1 m$^3$ (20 bags) of granular expanded clay 2-3, 3-8 or 8-20;
• 150 kg of type 32.5 cement;
• 80-90 litres of clean water (or less if the material is already wet).

How to prepare cement bound Laterlite Expanded Clay in a concrete mixer (No fines concrete, open-pore structure)

1° Pre-humidify the granules by pouring into the mixer:
- 3 bags of Laterlite Expanded Clay (150 litres);
- 10 litres of water.

2° Then pour into the mixer:
- 1 bag of cement (25 kg);
- 5 more litres of water.

3° Mix for 3 minutes.

Preparatory stage
1 bag - 25 kg + 10 litres + 5 litres

After mixing
Other binders
Other types of binder, such as hydraulic lime and resins, can also be used with Laterlite Expanded Clay. In some situations it may be necessary to use the hydrophobic version of Laterlite Plus. For further information, consult Technical Support.

LAYING WATERPROOFING AND PAVING: LEVELLING/Cover SCREEDS
If paving or waterproofing is to be laid on top of loose Laterlite Expanded Clay whose surface has been consolidated with slurry or that has been bound with cement, a top screed is required to level the surface and distribute the loading. This screed can be made using one of the Latermix range of pre-mixed screeds, or a traditional sand/cement mix. It can vary in thickness from 3 cm if it is to take an impermeable membrane to 5 cm if a residential type of floor finish is to be applied.

CONSIGNMENT

BAGS
Granular Laterlite Expanded Clay is consigned in easy-to-handle 50-litre polythene bags (20 bags/m³), on non-returnable wooden pallets each holding the following quantities:
- 30 bags (1.5 m³) of the 0/2 denomination.
- 60 bags (3.0 m³) of the 2/3 denomination.
- 75 bags (3.75 m³) of the 3/8 and 8/20 denominations.
By request, the 3/8 and 8/20 denominations of Laterlite Expanded Clay can be consigned on pallets each holding 35 or 65 bags.

BIG BAGS
By request, all types of Laterlite Expanded Clay can be consigned in big bags of capacity approx. 1 – 1.5 – 2 – 2.75 – 2.2 – 3 m³.

LOOSE
All types of Laterlite Expanded Clay can be consigned loose:
- in tipper trailer trucks (bulk cereal side or rear tipping type) of capacity up to 65 m³ depending on the denomination and type, or in “walking floor” trailer trucks of capacity up to 80 m³.
- in silo trailer trucks of capacity up to 60 m³ fitted with pumping gear of power sufficient to move the material for a distance of up to 30m vertically or 80m horizontally.
- in containers for sea transport
- by ship for large quantities of product in bulk.
By request, different denominations can be delivered in a mix of sizes.
**Flat and sloping roofs**

When used on a roof Laterlite Expanded Clay ensures that the necessary degree of insulation combined with high thermal inertia - the two indispensable requirements for comfortable winter and summer habitation - will be met. Because it is a lightweight material it can be laid to a considerable thickness without excessively loading the structure.

In its loose form, after it has been consolidated on its top surface, or has been bound with cement, it can be used as an insulation layer that can incorporate falls for rainwater run-off, or as ballast on top of a waterproof layer. If it is to take an impermeable membrane, a screed will be required (see p. 7). It can also be applied on roof pitches if is consolidated with cement.

**As a base layer for a floor finish**

Because of the low specific weight of Laterlite Expanded Clay it can be laid to considerable thicknesses, and can incorporate services (electrical, water), whilst keeping the structural loading low.

The porous nature of the expanded clay granules gives excellent thermal installation and improves acoustic insulation.

For laying the floor finish, a lightweight insulating top screed is required, either using one of the mixes in the Latermix range or a traditional sand/cement mix.

**Lightweight insulating backfill, including for refractory purposes**

New construction often requires a backfill material that is stable, durable, lightweight, and non-combustible. It is even more frequently required for structural purposes in the refurbishment of old buildings, for instance as a lightweight fill on top of old structural vaults and different types of floors and decks, etc.

Laterlite Expanded Clay is extremely well-suited to these applications. It can also be used as backfill in proximity to structural elements that are combustible (such as timber stairs and suspended floors, in relation to which see also Laterlite Plus).

Laterlite Expanded Clay is also extensively used as an insulation material in civil and industrial construction as fire protection, for making safe active or redundant cisterns and storage tanks, for laying underground pipelines, and as insulation at high temperatures, including of refractory type.

**Insulation for foundations and earth retaining walls**

The underground parts of buildings must be adequately insulated to reduce heat loss into the ground. Laterlite Expanded Clay can be used for this purpose in civil, industrial, and zootechnical buildings, and as a hardcore layer with effective insulating characteristics below most floors, including industrial floors, refrigerated cold stores, or floors that incorporate heating pipe-work. For these types of application the recommended product is Laterlite Plus Hydrophobic Expanded Clay, which is also very effective against rising damp or as insulation and drainage behind vertical earth-retaining structures.
Roof voids
Laterlite Expanded Clay can be used in roof voids as a durable insulating layer of high compressive strength that is impenetrable to rodents or birds. Its very good thermal inertia makes it particularly effective as insulation that reduces summer overheating. If the roof void is not walkable, the product can be laid loose (or in bags placed directly on the floor). If the roof void is to be accessible, the surface can be slurred or covered with wood-cement slabs; if it is to be walkable, the product can be mixed with cement and topped with a screed.

Lightweight structural cast concrete
Laterlite Expanded Clay and Laterlite Structural are special high-strength aggregates that can be used as a component of lightweight structural concretes for the construction of collaborating floors, strengthening existing floors, and for in-situ or precast structures, giving significant weight savings as well as a number of other significant benefits.

Landscaping and roof gardens
Laterlite Expanded Clay is widely used as a lightweight drainage layer in landscaped areas (green roofs, roof gardens, ponds, planters), or as a component of the growing or mulching layer for all types of garden. Laterlite Agri Expanded Clay, the special aggregate with neutral pH, is a suitable product for these applications and for hydroculture.

Blocks and small precast elements, including refractory products
The lightness, insulating, and fire resistance characteristics of Laterlite Expanded Clay make it the most important base material for fabricating a wide range of precast elements and components including refractory and sound absorbing products, such as blocks for construction, precast panels, chimneys and flues, fireplaces, and barbecues.

Geotechnical engineering and road construction
The lightness and strength characteristics (its high angle of internal friction) of Laterlite Expanded Clay enable it to be used as a lightweight gravel for constructing embanked roads, reducing the weight of foundations, backfilling behind gravity retaining walls and reinforced retaining walls, stabilising slopes, backfilling tunnels and underground cavities, drainage, and in all geotechnical engineering applications (a specific manual is available for these types of application). Laterlite Expanded Clay and Laterlite Strutturale Expanded Clay can also be used as components of bituminous mixes for high-adhesion sound-absorbing asphalts.