LITECRETE

Light Weight Concrete

GENERAL DESCRIPTION

AXEL LITECRETE is a light building material, lighter than conventional concrete. It contains a chemical active material where expansion takes place when mixed with water. This chemical reaction generates millions of tiny air pockets, yielding superior thermal insulation and lightweight property. In the meantime, a pressure force is released during the reaction forming lifting properties.

AXEL LITECRETE's unique chemical reaction and characteristics enable it to exhibit a large number of properties which make it can be utilized in a wide range of construction applications, including widening of in-service road, banking of steep sloping land, reducing earth pressure at bridge abutment, improvement of low-head of tunnel inlet and uneven earth pressure, various light-weight banking and replacement filling at airports/ports, filling of large pipelines such as water, gas and electric power supply, closure works of various hollows at old mine site, air-raid shelter, and cavity filling works including backfilling at tunnels.

RECOMMENDED USES

AXEL LITECRETE can be precast or cast in situ. Because of its exceptional product properties, Litecrete can be designed and used in/as:

* Insulation screed, block and panels.
* Fire protection wall.
* Partition wall
* Void filling
* Ground lifting and leveling
* Earth-Pressure Reduction at Bridge Abutment
* Shield filling
* Load alleviated filling
* For weak ground or soil
* Other hard to access places where alternative lightweight soil is necessary

CHARACTERISTICS & ADVANTAGES

* Fluidity
* High Construction Performance
* Lightweight
* Self-Support
* Excellent Durability
* Strength/Weight Can Be Set Freely.

PACKING

30 kg per set

COLOURS

Grey

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COVERAGE

(Coverage may vary depending on substrate condition, temperature and application method)

Density (kg/m3)	Coverage for 1 set (30kg)
600	0.050 m^3 ± 0.002
800	0.038 m^3± 0.002
1000	0.030 m^3± 0.002
1200	0.025 m^3± 0.002
1400	0.021 m^3± 0.002
1600	0.018 m^3± 0.002

SURFACE PREPARATION

The substrate must be clean and free from oil, grease and other contaminants. Refer to annex specific details for other applications.

METHOD OF APPLICATION

* **AXEL LITECRETE** can be mixed by handheld electrical cement mixer.

* One set of **AXEL LITECRETE** include 2 parts of powder (A and B).

* Mix Litecrete **part A** with water until reach a homogeneous consistency. Then mix **part B** with water homogeneously

* Below is the table chart of water amount mix with powder A and B for different densities.

Density (kg/m3)	Water mix with Powder A	Water mix with Powder	Total of water for one set
1200	7 litres	0.5 litres	7.5 litres
1000	6.5 litres	1.5 litres	8 litres
800	7.0 litres	2.0 litres	9 litres
600	7.5 litres	2.5 litres	10 litres

* Add in mixture B into slurry A and mix for 2-3 minutes.

* Pour or pump the mixture and wait for the expansion to occur. Expansion time is around 40-60 minutes.

* Cut off any extra slurry and level it with a trowel.

CLEANING OF TOOLS

Clean all tools and application equipment with water immediately after use. Hardened and or cured material can only be mechanically removed.

STORAGE

Store in a dry, cool and shaded place. (Avoid from flame and water

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TECHNICAL SPECIFICATIONS

No. of component	Two
Density	Can set from 600-1600 kg/m^3
Volume of solids	100%
Flammability	Non-combustible (BS476 Part 4)
Expansion reaction	Approximately 1 hours ended the expansion reaction
Compressive strength (28 days)	1-12 Mpa (depend on mix design)

* LIGHTWEIGHT

Can be designed from densities 600 to 1600 kg/m^3 which is 2 or 3 times lighter than conventional concrete. Its low density is due to the formation of tiny air voids during aeration process.

This lightweight properties make it easily to handle and carry during installation, furthermore may reduce the energy consumption of workers.

* EXPANSION REACTION

AXEL LITECRETE is also suitable for some civil engineering and geotechnical applications. An expansion reaction takes place after Litecrete powder mixing with water. When Litecrete is injected into ground, it expands in volume and fills voids or spaces underground while compacting the surrounding soil using expansive pressure. The load bearing capacity of the soil is increased as a result of the placement of Litecrete material. A pressure force is created by the expansion yielding a lifting property. This makes Litecrete material easily utilized in lifting of slabs, concrete roadways, sidewalks, driveways, etc.

*** ASTM C940-16 Standard test method for expansion and bleeding of freshly mixed grout for preplaced-aggregate concrete in the laboratory, SIRIM QAS International Sdn Bhd, Malaysia.**

A test was conducted to determine the bleeding and expansion of Axel Litecrete product. Results show that no bleeding was observed and the expansion reaction was more than 25% after 30 minutes of mixing.

* IMPACT RESISTANCE

The porous cell structure of Litecrete can absorb most impacts.

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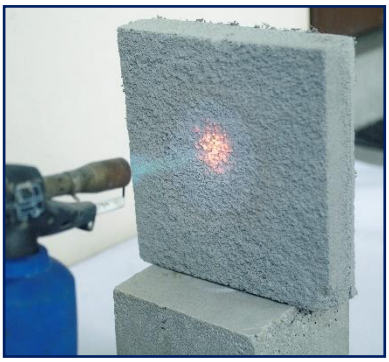
* FIRE PROTECTION



AXEL LITECRETE is classified as a non-combustible building material conforms to BS476.

The porous substrate significantly delays the heating up process compared to other masonry materials, thus giving good fire resistance properties.

Litecrete will not ignite nor generate toxic fumes because of its non-combustibility features.

* COMPRESSIVE STRENGTH

AXEL LITECRETE is reinforced with fibers to reduce plastic shrinkage and enhance concrete strength.

Concrete cube samples with densities 1200 kg/m^3 (size 5cm x 5cm x 5cm) were tested for compressive strength by Setsco Service (M) Sdn Bhd according to BS EN 12390-Part3:2009. Compressive strength for 3 days can reach average 4.6 N/mm^2 while 7.8 N/mm^2 for 7 days.

Concrete cube samples with densities 800 kg/m^3 (size 5cm x 5cm x 5cm) were tested by Sirim QAS with standard ASTM C942-15 and results showed that compressive strength for 7 days can reach 2 N/mm^2.

Table below showed 28days compressive strength for different densities:

Density (Kg/m^3)	Age (Days)	Cube Size (m^3) Length x Width x Height	kN/m^3	Average Load (kN)	Average Load (MPa) = Load,kN/2.5mm^2
600	28 Days Strength	0.05 x 0.05 x 0.05	5.88	3.0	1.2
800			7.85	9.0	3.6
1000			9.81	13.5	5.4
1200			11.77	18.5	7.4
1400			13.73	27.0	10.8
1600			15.69	30.0	12.0

* THERMAL & SOUND INSULATION

Air voids / air pockets that are generated in Litecrete provide excellent thermal insulation properties because presence of air is a perfect thermal conductor. With more air voids, the thermal conductivity of Litecrete is reduced.

Litecrete contributes a positive impact in energy efficiency through reduction in total building energy consumption by retarding the heat flow into or out of the building due to its low thermal conductivity.

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Cellular structures of Litecrete also acts as a sound insulation and absorption barrier. The tiny air pockets prevents the sound wave transmission from one side to the other side. With this characteristic, Litecrete is ideal for construction like hotels or apartments where typically provides STC rating (sound transmission class) 40 for 100 mm thickness, 45 for 200 mm thickness.

* VARIETY OF FORMS, SIZES AND DENSITY

Can be sawed. Designed for different densities, shapes and sizes to meet project's requirement.

Application with different densities:

Density 300-600 kg/m^3 : Primarily applied for thermal insulation or fire protection.

Density 700-800 kg/m^3 : Also used for void-filling, such as a landscaping (above underground construction), to fill voids behind archways and refurbishing of damaged sewerage systems. It is also been used to produce building blocks.

Density 900-1100 kg/m^3 : Serves to foremostly produce blocks and other non-load bearing building elements such as balcony railings, partitions, parapets and fence walls etc.

Density 1200-1400 kg/m^3 : Are the most commonly densities for prefab and cast in situ walls, load bearing and non-load bearing. It is also used for floors screeds (sound and insulation plus weight reduction)

Density 1600-1800 kg/m^3 : Be recommended for slabs and other load-bearing building elements where higher strength is obligatory

* COST SAVING – MINIMAL USE OF MATERIALS

Lesser materials are used compared to conventional concrete. For example, an area of 5m^3 only needs an approximate 3 m^3 of Litecrete material. However, volume needed will differ according to design mix.

Litecrete dry mix	Densities design	Volume obtained
1000 kg	600 kg/m^3	1.60 m^3
	800 kg/m^3	1.25 m^3
	1000 kg/m^3	1.00 m^3
	1200 kg/m^3	0.80 m^3
	1400 kg/m^3	0.70 m^3
	1600 kg/m^3	0.60 m^3

SHELF LIFE

12 months from the date of production if stored properly in original, unopened and undamaged sealed packaging in dry conditions.