



LIHE輕固節能牆六大特點

Six features of LIHE lightweight energy-saving brick

優質防火 Fire Proof Quality

以7.7cm 牆體厚度符合CNS12514 測試規範，經內政部核發一小時防火時效認證。單材料防火

性能更達三小時牆體不崩落、不穿透，熔點高達1108°C。

The 7.7cm wall thickness meets the CNS12514 test specifications, and is awarded One-hour Fire Aging certification by the Ministry of the Interior. The single-material wall's fire performance is even up to three hours without collapsing or penetration, with a melting point of up to 1108 ° c.

高效隔音 Highly Efficient Soundproofing

以7.7cm 牆體厚度達到高低頻噪音源阻隔平均42db(STC 42)，以維護居家安寧需求，同時節省牆體厚度增加生活空間應用。

The 7.7cm-thick wall achieves an average blocking of high-frequency human voice of 42db (STC 42) to meet the need of home quietness while having the wall thickness reduced to increase living space.

環保綠能 Environmental Protection and Green Energy

氧化矽、氧化鋁成分一般的回收過程就要經過 人工處理 粉碎磁選處理 洗滌 二度人工處理

震動篩除金屬 粉末化，這當中還不含回收、分類等繁複過程，一切都是為了，更美好的生存環境。

The glass has to go through the recycling process of: manual processing pulverization and magnetic separation washing second manual processing vibration metal screening pulverization. The process does not include complex processes such as recycling and classification, and it is all for a better living environment.

Achievement Value



輕質減震 Light Weight for Better Cushioning

LIHE輕固節能牆每平方米僅重15kg，遠比紅磚、混凝土一米平方動輒265kg 以上來的低，高樓層建物、中古屋翻修常產生樓層傾斜、崩塌的狀況將能大幅減少。

The per square-meter weight of **LIHE lightweight energy-saving bricks** is only 15kg, which lighter than an ordinary brick or concrete with a per square-meter weight of more than 265kg. The light weight can significantly reduce the occurrence of tilting and collapse of high buildings and renovated old buildings.

隔熱節能 Energy-Saving Insulation

經測試方法CNS7333 驗證，LIHE輕固節能牆熱傳導率為0.071(W/m· k)，實際驗證夏天最高時，四周牆體使用LIHE輕固節能牆之建築，最高室內外溫差達攝氏12 度，冷氣溫度控制26-28 就可以節約兩成用電量，不但省能也省荷包。

Verified with the CNS7333 test method, the thermal conductivity of **LIHE lightweight energy-saving bricks** 0.071 (W/m· k). In the actual verification, in the hottest summer days the indoor and outdoor temperature difference of buildings using **LIHE lightweight energy-saving** bricks for their surrounding walls is up to 12 degrees Celsius, and the use of electricity can be saved by 20% at an air-conditioning temperature controlled at 26-28 degrees Celsius. It does not just save energy but also saves money.

無毒無害 Non-Toxic and Non-Health Hazardous

甲醛、乙醚、石棉對人體神經系統、健康都有影響，而LIHE輕固節能牆完全不含任何有機質，也不含任何有毒材料，保障居家安全與使用者健康。

Formaldehyde, ether and asbestos have an impact on the human nervous system and health. **LIHE lightweight energy-saving bricks** are completely free of any organic substance or toxic materials, and can protect home safety and users' health.

Achievement Value



結構特性與組成

Structural Characteristics and Composition

LIHE輕固節能牆的主要成分為：水泥、面板玻璃砂(氧化矽、氧化鋁成分)

The main components of **LIHE lightweight energy-saving bricks** are cement and panel glass sand (containing silicon oxide and aluminum oxide).

氧化鋁為紅寶石、藍寶石等稀有寶石的主要成分，晶體具有堅硬的結構，因此也應用於精密切割、高速鐵路的煞車系統。

Alumina is a main component in rubies, sapphires and other rare gems. Its crystal has a hard structure and is therefore used in precision cutting and high-speed railway brake systems.

氧化矽這樣的成分具有較低的膨脹係數，對於溫度的變化不會有顯著的變化，同時也有更好的硬度，此外對於熱的傳導性很低，是作阻熱材的絕佳成分。

A component like silicon oxide has a low coefficient of expansion with no significant response to temperature changes, but a better hardness. In addition, it has a low thermal conductivity and is great for a heat-resistant material.

將這樣不容易取得的材料，結合水泥成分，形成蜂巢結構，應用於建築材料、隔音材料、防火材料上，是一種全新的突破，同時也是將建築提升到另一個層次。

A honeycomb structure is formed after combining this difficult-to-obtain material with cement, and its use in building materials, soundproof materials and fire-prevention materials is a new breakthrough and elevates construction work to another level.

Achievement Value



LIHE輕固節能牆

LIHE lightweight solid wall

使用輕鋼構的骨料材質與框架理論概念，設計基本工法，配合LIHE輕固節能牆，組成LIHE輕固節能實心牆。LIHE輕固節能牆是由水泥與特殊處理的矽砂，進行微米分子化後的常溫發泡材料，透過特殊的蜂巢結構，達到良好的隔音與防火特性，蜂巢結構主要是透過無數個獨立的氣孔所含的空氣球體，形成一層又一層的空氣層，來達到音源與熱源的一個阻隔能力，此外，LIHE輕固節能牆由全無機質製成，在遭受火焰噴燒時，完完全全不會產生任何有毒有害的氣體，也不會產生濃霧，大大增加居家與建築物的安全保障。

LIHE lightweight solid wall is made with light steel and the frame theory and concept, the basic design method and LIHE lightweight energy-saving bricks. LIHE lightweight energy-saving bricks are made of room-temperature foam materials consisting of cement and specially treated silica sand with micron molecularization. The special honeycomb structure can achieve good sound-proof and fire-protection features. The honeycomb structure achieves soundproofing and fire-protection mainly through the air spheres contained in the numerous independent pores which form layers of air cushions to block sound and heat. In addition, LIHE lightweight energy-saving bricks are made of inorganic materials and do not produce any toxic or harmful gas or fog when burnt. They can greatly increase the security of homes and buildings.



特殊蜂巢構造的LIHE輕固節能牆，具有良好的防火、隔熱、隔音效果，搭配上具有良好耐震能力的輕鋼構框架系統，不但達到整體的結構輕量化，同時也能夠達到居家寧靜品質與居家安全等需求。

LIHE lightweight energy-saving bricks with a special honeycomb structure have a good fire-prevention, heat-insulation and soundproof effect. Coupled with a light steel frame system with a good seismic capacity, it can not only achieve a light weight of the overall structure, but can also meet the needs of home quietness and security.



不但重量僅有紅磚($260\text{kg}/\text{m}^2$)與RC($280\text{kg}/\text{m}^2$)的六分之一 (僅 $45\text{kg}/\text{m}^2$)，並於7.7cm的牆體厚度下，能達到阻隔噪音42~53db 的一個高效能表現。同時在遭受攝氏一千一百度火焰連續噴燒三小時後，背溫也僅僅最高攝氏95 度。

Not only is its weight (only $45\text{kg}/\text{m}^2$) one-sixth of that of a red brick ($260\text{ kg}/\text{m}^2$) or a RC ($280\text{kg}/\text{m}^2$), under a wall thickness of 7.7cm it can reach highly efficient performance of 42 ~ 53db noise barrier. In addition, after been burnt by a fire at 1100 degrees Celsius for three hours, the back temperature is only 95 degrees Celsius maximum.

Achievement Value



與各主要牆體比較表：

Table of comparison with other major walls:

	LIHE輕固節能牆 LIHE lightweight solid wall	RC 牆 RC Wall	1B 磚牆 1B Brick	輕質灌漿牆 Light grouting wall
施工速度 / 裝修等待期 Construction speed / decoration lead time	20~24m² / 一天 20 ~ 24m ² / one day	120m ² / 28 天 120 m ² /28 days	4~6m ² / 兩週 4~6m ² / two weeks	140m ² / 28 天 140 m ² /28 days
隔音效能(阻隔分貝/ 牆厚) Soundproofing effectiveness (dB barrier / wall thickness)	42~53db / 7.7cm	40db / 16cm	38~40db/15cm	32~35db / 10cm
隔熱效率(內外溫差) Insulation efficiency (indoor and outdoor temperature difference)	9~12 度 9 ~ 12 degrees	3~4 度 3~4 degrees	3~5 度 3~5 degrees	4~6 度 4~ 6 degrees
施工技術門檻 Construction technology threshold	不需高度技術工班 No highly technical work required	板模工要求 較高	泥水匠技術要求	中等 Medium



		Sophisticated formwork required	高 Sophisticated mason technology required	
品牌建立 Branding	台灣里和企業 (20多年工程履歷) Taiwan-LIHE	無 None	無 None	無 None
釘掛 Nailing	一般螺絲釘掛 Suitable for general screws	可隨意釘掛 Suitable for all types of nailing	可隨意釘掛 Suitable for all types of nailing	無法釘掛 Not suitable for nailing
牆體 單點荷重 Wall's single-point load	≥45kg	≥75	≥75	
市場區隔 Market segmentation	重視隔音、防火安全 品質用戶 A focus on soundproofing, fire safety and quality	主體結構使用 Used for main structures	傳統建築結構 與分隔間使用 (低樓層) Used for traditional construction structures and compartments (on low floors)	一般較無需求 之隔間牆使用 Used for partition walls with no particular requirements