

UniMAP LIGHTWEIGHT BRICK (ULB)

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Introduction

The majority of regular bricks produced are in the density range of 1500 kg/m^3 to 2100 kg/m^3 . It is heavy, hard to work with, and after it sets, one cannot cut or nail into it without some difficulty or use of special tools.

Lightweight bricks begin in the density range of less than 1500 kg/m^3 . It has traditionally been made using such aggregates as expanded shale or clay. Lightweight brick construction can be a partial solution for several environmental problems.

Product Description:

UniMAP Lightweight Brick is made from cement, fine aggregate & waste (rice straw, saw dust, gypsum board & etc.). This project presents an experimental study which investigates the potential use of wastes for producing a low-cost and lightweight composite as a building material. Some of the physical and mechanical properties of UniMAP Lightweight Brick are investigated.

TECHNICAL DATA	PRODUCTS COMPARISON		
	CLAY BRICK	SAND BRICK	UniMAP LIGHTWEIGHT BRICK
SIZE	215mm x 70 mm x 96mm	220mm x 70mm x 95mm	220mm x 70mm x 95mm
COLOUR	Orange	Grey	Grey Yellowish
COMPOSITION	Surface Clay	Dense aggregate with OPC and/or dense lightweight with OPC	
DENSITY	1471kg/m ³ - 1671kg/m ³	1709kg/m ³ - 2055kg/m ³	1164kg/m ³ - 1232kg/m ³
DRY WEIGHT	2.2kg - 2.5kg	2.5kg - 3.0kg	1.7kg - 1.8kg
COMPRESSIVE STRENGTH	25N/mm ²	20N/mm ²	10-15N/mm ²
PRODUCTION COST (1000 bricks)	RM350	RM200	RM100-RM160
WEIGHT PER PALLET ($\frac{528 \text{ Bricks}}{\text{Pallet}}$)	1320kg (max)	1584kg (max)	950.4kg (max)

Novelty of the product

- 1) **Decreased Dead Load.** Less mass is required to support additional weight. Structural reinforcement can be less demanding.
- 2) **Sound Absorption.** The transmission of sound is inversely related to the number of air/solid interfaces. UniMAP Lightweight Brick (ULB) has a high number of these interfaces, thus more sound is absorbed.
- 3) **Simplicity.** Ordinary tools can be used for alterations. It can be easily sawn and sculpted, and nailed or screwed without pre-drilling.
- 4) **Seismic (Earthquake) Resistance.** In lower densities concrete can actually absorb shock. Lightweight brick often used in ballistic tests because of this ability. Hammer blows can be absorbed without fracturing the brick.
- 5) **Economic.** Less handling weight makes all aspects of moving bricks easier, resulting in reduced labor costs and quicker turnover.