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PHYSICAL AND MECHANICAL PROPERTIES OF RUBBERCRETE INTERLOCKING BRICKS

INTRODUCTION

This chapter will discuss the physical and mechanical properties of rubbercrete interlocking brick. The final mix design proportion was chosen based on the compressive strength of the trial mix and response surface methodology (RSM) analysis. The physical and mechanical properties of the rubbercrete interlocking bricks, including dimension, the initial rate of suction, water absorption, density, compressive strength, modulus of rupture, efflorescence, thermal conductivity and elevated temperature test have been conducted at the age of 28 days of curing period.

PHYSICAL PROPERTIES

Various physical and mechanical properties tests have been conducted on the rubbercrete interlocking bricks such as dimension, the initial rate of suction, water absorption, density, compressive strength, modulus of rupture, thermal conductivity, efflorescence and elevated temperature test. The test standard and the number of specimens required for each test shown in Table 4.1.

Dimension Tolerance

The dimension test has been conducted to ensure the rubbercrete interlocking brick has a uniform size and does not exhibit much

Table 4.1 Specimens requirement for physical testing

Test	Dimension (mm)	Number of specimens	Standard
Dimension	250 × 125 × 105	24	BS 3291
Initial rate of suction	250 × 125 × 105	5	ASTM C 67
Water absorption			
5-hour boiling	250 × 125 × 105	10	ASTM C 67
24-hours old immersion	250 × 125 × 105	10	
Density	250 × 125 × 105	5	BS EN 12390-7
Modulus of rupture	250 × 125 × 105	5	ASTM C 67
Thermal conductivity	10 × 10 × 10	5	ASTM D 7984
Efflorescence	250 × 125 × 105	10	ASTM C 67
Elevated temperature	50 × 50 × 50	18	-

size variances. According to The Brick Industry Association, the size of the brick is usually determined according to the design and client's specifications. The dimensions of twenty-four (24) bricks have been tested according to the requirements of BS 3921 [38]. Dimension test has been conducted by arranging 24 bricks as per guideline in one straight line on a levelled surface and in contact with each other. The bricks shall be clean from any dust to acquire an accurate result.

Measurement of height, width and length of 24 bricks have been recorded. The individual size should not vary greatly from the average size of 24 bricks. The variation between the batches is one of the factors that causes the different sizes of the bricks. The tolerance of the individual brick should not exceed 6.4 mm on the length and 4 mm on width and height. The dimension test conducted is crucial as a uniform brick size helps to ease the installation process. Figure 4.1 illustrates the dimension test as per standard and Figure 4.2 shows the dimension test conducted on rubbercrete interlocking brick.