Optimizing the Recipe of Concrete Hollow Block Using Response Surface Methodology

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Abstract

This thesis studies the optimization of manufacturing hollow blocks recipes using Response Surface Methods (RSM). By using this method the cost of manufacturing was reduced by 7-10 percent compared with the old original recipe. The two key success factors considered were maintaining a minimum compressive strength of 10.5 KN/mm² and cost reduction. A total of thirty different recipes were selected using a design expert software. These recipes were carried out and thirty different batches of concrete hollow blocks were produced. Twenty one days later the compressive strength for the thirty different batches of concrete hollow blocks were tested in accordance with Omani National Standards for Precast Concrete Blocks. These results were fed into the software and an optimized recipe was obtained. The optimized recipe was tested and has shown to be successful.