

高性能混凝土配比實驗設計方法之比較研究

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摘要

Strength and slump are the important measures of high performance concrete. Because there are no mathematical models, the relationships between strength and slump and proportion must be deduced from collecting experimental data, then establishing models by regression analysis or artificial neural networks. Generally, construction material experiment designs lack systematic methodology. Therefore, this research attempts to use design of experiments (DOE) to design the experiments. This study used the traditional D-Optimal design method, and five kinds of experimental numbers to establish strength and slump models by artificial neural networks, respectively. The results showed that (1) to establish an accurate forecast model, the strength model needs more than 100 mix proportion experiments; the slump model only needs 50 mix proportion experiments, and (2) the models produced by D-Optimal design method are much more accurate than those produced by random design.

關鍵字：high performance concrete, proportion, design of experiments, D-Optimal.