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KANCHANA KANCHANASUNTORN : APPROPRIATE MIXES OF RAW MATERIALS FOR COST REDUCTION IN FLEXIBLE PVC PRODUCTION. THESIS ADVISOR : SOMCHAI PUAJINDANETR, Ph.D., THESIS CO-ADVISOR : ASSO. PROF. CHUVEJ CHANSA-NGAVEJ, Ph.D. 170 pp. ISBN 974-635-839-1

The physical and mechanical properties of PVC compound filled with Diocty Phthalate (DOP) plasticizer, calcium carbonate as filler and cereclor as plasticizer extender were studied. Two-step experiments were performed to study the optimum mixed compound for material cost reduction.

The first step, the factorial design with two replicates, was planned to prepare PVC compound test specimens mixed with DOP between 30-90 parts per hundred parts of resin, by weight (phr.) and calcium carbonate between 0-100 phr. The test specimens were performed to characterise for specific gravity, tensile strength, % elongation, modulus of elasticity and hardness. The properties were modeled as functions of the quantity of DOP and calcium carbonate using statistical technique of regression analysis. Then the problem was structured to find the minimum cost per unit formulation for a given set of physical and mechanical properties. The optimal point of DOP and calcium carbonate was found.

The second step, cereclor, was applied to reduce DOP quantity whereas the optimal quantity of calcium carbonate was kept at constant level. The maximum quantity of cereclor, which was used instead of DOP, was found.

The experimental results show that, the optimal quantity between DOP and calcium carbonate are 72.07 and 70.45 phr. respectively. This formulation induced 19.66 baht/kilogram of material cost. The maximum quantity of cereclor , which was used instead of DOP, was 35 phr. or about 51% replacement of DOP. This new formulation still maintains acceptable physical and mechanical properties required and can reduce cost of material from 19.66 to 18.66 baht/kilogram or 1.00 baht/kilogram of cost reduction.

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