

Mathematical Modeling for the Break-Even Point Problem in a Non-homogeneous System

Authors : Filipe Cardoso de Oliveira, Lino Marcos da Silva, Ademar Nogueira do Nascimento, Cristiano Hora de Oliveira Fontes

Abstract : This article presents a mathematical formulation for the production Break-Even Point problem in a non-homogeneous system. The optimization problem aims to obtain the composition of the best product mix in a non-homogeneous industrial plant, with the lowest cost until the breakeven point is reached. The problem constraints represent real limitations of a generic non-homogeneous industrial plant for n different products. The proposed model is able to solve the equilibrium point problem simultaneously for all products, unlike the existing approaches that propose a resolution in a sequential way, considering each product in isolation and providing a sub-optimal solution to the problem. The results indicate that the product mix found through the proposed model has economical advantages over the traditional approach used.

Keywords : branch and bound, break-even point, non-homogeneous production system, integer linear programming, management accounting

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