A Plant Simulation approach for optimal resource utilization: A case study in the tire manufacturing industry

Butrat, A.\textsuperscript{a}, Supsomboon, S.\textsuperscript{b,*}

\textsuperscript{a,b}The Sirindhorn International Thai-German Graduate School of Engineering, King Mongkut’s University of Technology North Bangkok, Bangkok, Thailand

\textbf{A B S T R A C T}

In this study, the resource allocation and vital manufacturing processes in the tire manufacturing industry was comprehensively optimized. The paper deals in detail with the Banbury mixing process, which produces homogeneous rubber materials for tire components. In addition, the mixing process models were established by the Plant Simulation software to validate and compare scenarios and experiments with realistic production constraints. Discrete empirical distribution (dEmp) was proposed for population data. Various scenarios were created for different resource and process. Experiments were set as different group of compound set. Experiment manager was used as a tool to set up scenarios and the experiments to provide alternative results. The study results display the production time and machine utilization. The shortest production time of experiment results represents the best group of each scenario. As results, the scenario, which BB1 is changed from non-productive Banbury mixer to special Banbury mixer along with the normal process is combined with second special process, provides the suitable production volume which can reduce of total production time for 8.06 %. Our study provides a variety of the resource utilization of a Banbury mixing process and suggests an efficient optimization method for production performance improvement.

\textbf{A R T I C L E   I N F O}

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*Corresponding author: Srisawat.s@tggs.kmutnb.ac.th (Supsomboon, S.)

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\textbf{References}


