

Performance Improvement of PID Controls in Tyre Vulcanisation Process

R. Sahu and S.K. Mathew

Abstract

Today's global competitive business environment challenges tyre-manufacturing industries to implement continuous improvement systems that can reduce cost of production and improve product quality. Proportional-Integral-Derivative (PID) controllers play a key role in deciding the quality of vulcanised tyres. This paper proposed a matrix of performance indices to effectively assess control performance of curing presses with respect to standard benchmarks. The usefulness of λ -tuning as a uniform method for performance improvement of vulcanisation plant process control is also explored. The tuning method gave satisfactory results when analysed with the help of the performance matrix. The proposed methods were validated through temperature control loop data of a few curing presses using MATLAB simulation.

Keywords: Tyre vulcanisation, PID control, process control, performance improvement, controller-tuning