Performance Analysis of TBR Tire Curing Process

D. B. Jani[1], S. B. Dikshit[2], N. J. Vadera[3]

Department of Mechanical Engineering (CAD\CAM)

Associate Professor, Department of Mechanical Engineering[1,3]

P.G. Scholar, ME (CAD/CAM), Department of Mechanical Engineering[2]

Government Engineering College Dahod, Gujarat, India

dbjani@rediffmail.com and vaderanilesh97@gmail.com

Abstract: *Numerical algorithms and computer programs have been developed to determine optimal cure steps in a tire curing process. A dynamic constrained optimization problem was formulated with the following ingredients: (1) an objective function that measures product quality in terms of final state of cure and temperature history at selected points in a tire; (2) constraints that consist of a process model and temperature limits imposed on cure media; (3) B-spine representation of a time-varying profile of cure media temperature. The optimization problem was solved using the complex algorithm along with a finite element model solver. Numerical simulations were carried out to demonstrate the procedure of determining optimal cure steps for a truck/bus radial tire. © 1999 John Wiley & Sons, Inc. J Apple Polymer Sic 74: 2063–2071, 1999.*

Keywords: tire curing process; cure steps; state of cure; dynamic optimization; B- spine

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