IJARSCT



International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)

International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal

Volume 3, Issue 2, December 2023

Experiment Analysis of TBR Tire Curing Process

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Abstract: The optimization problem was solved using the complex algorithm along with a finit element model solver. Numerical simulations were carried out to demonstrate the procedure of determining optimal cure steps for a truck/bursa dial tire. © 1999 John Wiley & Sons, Inc. J App Poly m Sci 74: 2063–2071, 1999 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 a at selected points in a tire; (2) constraints that consist of a process model and temperature limits imposed on cure media; (3) B-splines representation of a time-varying Profile of cure Media temperature

Keywords: curing; internal mold; energy consumption; electromagnetic induction heating; production accuracy

REFERENCES

- Wang YS, SU BL, Wu J (2012) Simulation and optimization of giant radial tire vulcanization process. Proceed Eng 31:723–726
- [2]. CLAXTON WE, Holden HC (1977) Tire cure and heat transfer sim- ULATOR. US Patent4,044,600
- [3]. AMBELANG JC, Prentice GA (1972) Digital method of calculating the flow of heat through a tire during vulcanization. Rubber Chem TECHNOL 45:1195–1201
- [4]. Prentice GA, Williams MC (1980) Numerical evaluation of the state of cure in vulcanizing rubber article. Rubber Chem Tech
- [5]. TOTH WJ, Chang JP, ZANICHELLIC (1991) Finite element evaluation of the state of cure in a tire. Tire Sci TECHNOL19:178–212
- [6]. Han IS, Chung CB, JEONG HG,KANG SJ, Kim SJ, Jung HC (1999) Optimal cure steps for product quality in a tire curing process. J ApplePoly m Sci 74:2063–2071
- [7]. Tong J, YAN X (2003) Finite element analysis of tire curing pro- cuss. J Reinf Plast Compos 22:983–1002
- [8]. YAN X (2007) A numerical modeling of dynamic curing process of tire by FINITE element.POLYM J 39:1001–1010
- [9]. GHOREISHY MHR, Nader i G (2005) Three-dimensionalFINITE element modeling of rubber curing process. J ELASTOM Plast 37:37–53
- [10]. RAFEI i M, GHOREISHY MHR, NADERI G (2009) Development of an advanced computer simulation technique for the modeling of rubber curing process. Compute Mater Sci 47:539–547
- [11]. ABHILASH PM, Kennan K, VARKEY B (2010) Simulation of curing of a slab of rubber. Mater Sci Eng B 168:237–241
- [12]. ZHANG J, Tang W (2013) Rubber curing process simulation based on parabola model. J Wuhan Univ TECHNOL Mater Sci Ed 28:150–156
- **[13].** Wang DH, Dong Q, JIA YX (2015) Mathematical modeling and numerical simulation of the non-isotherm in-mold vulcanization of natural rubber. Chin J POLYM Sci 33:395–403
- [14]. GHOREISHY MHR,RAFEI M, Nader i G (2012) Optimization of the vulcanization process of a thick rubber article using an advanced computer simulation technique. Rubber Chem Techno 1 85:576–589

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Volume 3, Issue 2, December 2023

BIOGRAPHICAL NOTES



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