

OUTLINE

Issues on the Surface Integrity of Case Hardened Steel Materials

Aims & Scope

The Utilization of surface engineered materials in various engineering applications has increased tremendously in recent years. This in turn, has enthused many researchers to identify the right surface engineering process with right processing variables for the right application. Surface heat treatment is one such surface engineering process which has been in vogue for long time. But, unlike the other heat treatment processes – full hardening processes, surface heat treatment process requires further research to obtain tailor made characteristics on the materials used. Because of the complexity and condition under which the surface heat treatment process has to take place, it is difficult to conduct the study and fully understand and control the process. For the requirements and difficulties expressed above, finding out the ways and means of obtaining appropriate surface characteristics on the metallic (steel) components used in various applications, like automobiles and aerospace engineering remains an active area of research.

This supplement issue is aimed at providing a recent update on the various issues related to surface integrity of Gas carburized and Induction hardened Steel materials. It also covers the Modeling of Phase transformation in Induction Hardening.

Keywords: Gas carburizing, Induction hardening, Process variables, Optimization, Taguchi's method, Factorial method, Hardness, Case depth, Distortion, Modeling, Phase transformation and Residual stresses.

SUBTOPICS

- Article 1. Hardness and Case Depth Analysis Through Optimization Techniques in Surface Hardening Processes**
K. Palaniradja, N. Alagumurthi and V. Soundararajan
- Article 2. Modeling of Phase Transformation in Induction Hardening**
K. Palaniradja, N. Alagumurthi and V. Soundararajan
- Article 3. Thermal and Metallurgical Effects associated with Gas Carburized and Induction Hardened Components**
K. Palaniradja, N. Alagumurthi and V. Soundararajan
- Article 4. Residual Stresses in Case Hardened Materials**
K. Palaniradja, N. Alagumurthi and V. Soundararajan

BIOGRAPHICAL NOTES

N. Alagumurthi received a BE in Mechanical Engineering from the University of Madras in 1987, an MTech in Energy Technology from Pondicherry Engineering College, Pudhucherry in 1996 and his PhD from Pondicherry University in 2006. He has had more than 22 years of teaching experience. Presently, he is working as a Professor in the Department of Mechanical Engineering of Pondicherry Engineering College; Pudhucherry. He has published more than 100 papers in various journals and conference proceedings. His researches include heat transfer, energy and thermal aspects in machining. He is a Fellow, Life and Honorary Member in various professional bodies.

K. Palaniradja received a BTech in Mechanical Engineering from Pondicherry Engineering College, Pudhucherry in 1994, an MTech in Energy Technology from Pondicherry Engineering College, Pudhucherry in 1996 and his PhD from Pondicherry University in 2006. He has had more than 12 years of teaching experience. Presently, he is working as an Assistant Professor in the Department of Mechanical Engineering of Pondicherry Engineering College; Pudhucherry. He has published more than 35 papers in various journals and conference proceedings. His researches include heat treatment and energy studies. He is a Life Member in various professional bodies.

V. Soundararajan received a BE in Mechanical Engineering from the University of Madras in 1978, an ME in Production Technology from PSG College of Technology, Coimbatore in 1980 and his PhD from Indian Institute of Technology, Chennai in 1986. He has had more than 24 years of teaching experience. Presently, he is working as a Principal of V.L.B Janakiammal Engineering College; Coimbatore. He has published more than 100 papers in various journals and conference proceedings. His researches include manufacturing, design optimization and industrial engineering. He is a Fellow, Life and Honorary Member in various professional bodies and academic committees.

N. Alagumurthi
(*Guest Editor*)

Department of Mechanical Engineering
Pondicherry Engineering College
Pondicherry-605014
India
E-mail: alagumurthi@pec.edu