

Challenges in Fuser System Materials Design

Santokh Badesha, Xerox Corporation (USA)

Abstract

This presentation will describe work processes to develop new materials and enabling surfaces that provide improved subsystem performance in order to meet the needs for continuing improvement of all xerographic marking subsystems.

The presentation is in two parts. In the first part, the aforementioned work process will be described, beginning with the identification of new subsystem requirements. The major emphasis will be on performance optimization requirements.

The second part will show specific examples of fuser materials design, especially fluoroelastomers and release fluids. We will describe a comparative study of standard curing methodologies against novel functional silane cure systems, functional hydrocarbons and hybrids thereof. We will also review test data demonstrating improved composition performance with the utilization of these novel curing systems. The challenge of understanding the role of release vs. lubrication for image release will also be discussed. The presentation will close with material design challenges to optimize system interactions in the fuser nip impacting fuser component life and image quality.

Author Biography

Santokh S. Badesha is a Xerox Fellow in the Xerox Corporation's Innovation Group (XIG) and responsible for leading inter-organizational efforts with both internal and external value chain partners. These strategic partnerships design and execute front end research to design, develop and deliver functional materials and components, and subsystems. Recently, he has been appointed to the position of Manager, R&D Globalization and Open Innovation in XIG. Badesha received his PhD, in organic chemistry from the University of East Anglia, Norwich, U.K. in 1976 and an Honorary Doctorate of Science from Clarkson University in 2007.

Badesha holds 155 US patents and has over 50 peer reviewed key scientific publications and presentations. He has received numerous honors and awards. Badesha was named Fellow by the Royal Society of Chemistry, Chartered Scientist by the Science Council of UK, and received a Proclamation from the Mayor of Rochester, N.Y. He received the Distinguished Inventor of the Year Award from the Rochester Intellectual Property Law Association and was named to the Board of the Center for Advanced Materials Processing, Clarkson University. He was inducted into the Xerox Innovation Group Hall of Fame; received the Chester Carlson Eagle Award; a Xerox Excellence in Management Award; the Xerox President's Award; and numerous Xerox Excellence in Science and Technology Awards