

Samir Aouadi

Smart Coatings for High Temperature Lubrication

The Technology

Novel coatings have been developed with reduced friction and wear at high temperatures (temperatures greater than 500 °C). These coatings may be used by both the civilian and military space and aerospace industries to reduce friction and wear for critical components in moving assemblies.

Applications include piston rings for low-heat-rejection engines, lubricating cages for advanced gas turbines, gears and bearings for long-term service in space mechanisms, cages for turbopump bearings operating in liquid hydrogen and oxygen, lightweight gear and bearing systems, and low cost bearing systems for automobiles and industrial machinery. An emerging application in the aviation industry is hypersonics for military uses (e.g. Prompt Global Strike) which requires a vehicle to not only withstands extreme conditions, but can be controlled in them.



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Dr. Aouadi holds a B.S. in Physics from the University of Constantine, Constantine, Algeria; a M.S. in Physics from the University of Ottawa, Ontario, Canada; and, a Ph.D. in Physics from the University of British Columbia, British Columbia, Canada. His research expertise is primarily in the broad area of synthesis of nanostructures with an emphasis on coating technology. The main focus of his research is in reducing friction between moving assemblies for space and aerospace applications. His research is funded by the National Science Foundation, the Air Force Office of Scientific Research, the ARMY Research Office, as well as by industry (Bosch and Rolls Royce).