



# SUPERHARD AND SUPERSLICK COATING

## WHAT IS IT AND WHY IS IT NEEDED?

Frictional losses in an engine waste fuel—as much as 10 to 20 percent of the total fuel energy, depending on factors such as engine size, type, driving conditions and weather. Harmful exhaust emissions are typically higher in vehicles that use more fuel. Improving vehicle fuel economy cuts our nation's petroleum use and emissions of carbon dioxide, a win-win situation.

## WHAT IS ARGONNE DOING AND WHY?

Argonne researchers developed a novel superhard and superslick coating (SSC) that increases engine efficiency and component reliability. By reducing friction, this SSC improves vehicle fuel economy and reduces emissions.

In laboratory tests, Argonne's SSC reduced friction by 80 percent compared to uncoated steel. By virtually eliminating component wear, Argonne's SSC enables engine designers to innovate through the use of lighter-weight materials and novel approaches.

## WHAT HAVE WE ACCOMPLISHED?

- ▶ Argonne's SSC won an R&D 100 Award in 2009.
- ▶ Licensed to a company that produces coatings for automotive applications.

## WHERE DO WE GO FROM HERE?

Concepts developed and demonstrated under this project can be used to design novel coatings for applications such as manufacturing.

## WHO SUPPORTS THE WORK?

The work described was supported by the U.S. Department of Energy, Energy Efficiency and Renewable Energy Vehicle Technologies Office, Propulsion Materials Program.



*Loading components into the deposition system used to coat samples with Argonne's SSC.*