

Where Manufacturing Technology and Talent Matter



Developing Lightweight **HMMWV Brake Rotors Reducing weight by over 50%**

THE PROJECT: High Mobility Multipurpose Wheeled Vehicle (HMMWV) brake rotors are cast iron construction and are optimized for thermal capacity, wear and cost. They are heavy, prone to corrosion, and wear out at a rate that is dependent on duty cycle and environmental conditions (sand, dirt, water, etc.). As safety critical components, they must be serviced promptly when needed, which can prove costly.

Somnio Global's patented laser-assisted cold spray is optimized for wider area deposition and allows the application of a novel wear and corrosion resistant iron-based coating on the brake rotor that allows the use of lighter base materials, like aluminum alloys, for the inner structure. The weight savings and improved wear performance these materials allow over cast iron brake rotors will help improve the HMMWV's fuel efficiency, performance, safety, and cost of operation.

THE RESULT: Using modeling and simulation, the fin geometry of the rotor is optimized to improve heat transfer and overcome the challenge of thermal operating range of the aluminum-based rotor. Based on modeling, the preliminary findings indicate 50-54% weight reduction can be achievable through the use of this coated AI-MMC rotor.

R