

## WELDING OF HIGH STRENGTH ARMOR STEELS



Lehigh University is leading a project under AMC's Casting Solutions for Readiness (CSR) Program that will improve the strength of welds in high alloy steels. Eglin Steel, recently developed at Eglin Air Force base as an alternative to higher alloy materials, provides excellent properties for high strain rate defense applications at reduced costs relative to competing alloys. Fabrication of most DoD combatant vehicles with this new alloy will require welding to itself and other armor steels. However, the welding process can significantly reduce the strength of Eglin steel and other armor alloys, thus compromising the performance of the steel and combat vehicle. Therefore, the objective of this research project is to develop welding processes that improve the mechanical properties of welds on armor steels.

### SUCCESS STORY

**Problem:** Fusion welding is used extensively in the fabrication of military combat vehicles. The welding process can compromise the strength of the armor steels that are needed in these high performance vehicles.

**Solution:** Lehigh University led a effort that investigated new welding consumables and techniques for improving the strength of welds in armor steels.

**Benefits:** Increases in weld strength of nearly 50% were achieved with new welding consumables.

“BAE Systems is actively engaged in the Cast Eglin Steel program because we recognize the value in developing high performing steel alloys for legacy and future armored, combat vehicle systems. It is anticipated that complex castings of high strength material could improve survivability and reduce the manufacturing cost of certain cast components. Whether the focus is hull structures or hatches, cast Eglin steel has the potential to revolutionize combat vehicle design. The information from this project will help us develop welding procedures to preserve the mechanical properties of the welds made in Eglin steel.” – *Raymond Sciortimo, BAE Systems*

“The results from this project will improve the performance of welded steel castings and of cast/wrought welded fabrications.” – *Ron Bird, Stainless Foundry & Engineering (Retired)*



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