NMC news
Headlines from the Navy Metalworking Center
Advanced Metalworking Solutions for Naval Systems That Go in Harm's Way

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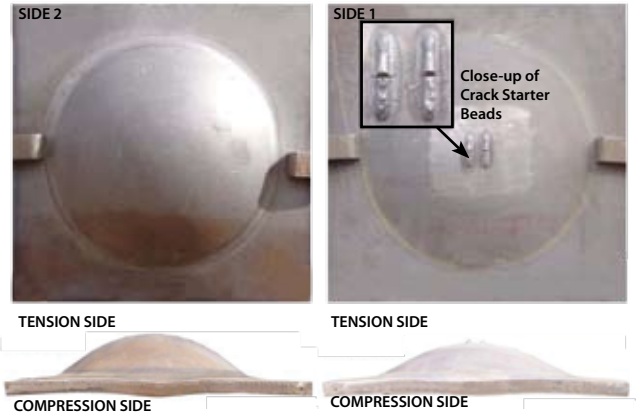
Navy Metalworking Center Innovation Approved for Use on Navy's Next Generation of Aircraft Carriers

A creative material processing innovation developed through a Navy Metalworking Center (NMC) project has been incorporated into the design of the USS Gerald R. Ford (CVN 78), the lead ship in the Navy's new class of aircraft carriers. The project was funded by the Office of Naval Research's Manufacturing Technology Program.



HSLA-115 has demonstrated excellent explosion performance even at reduced thicknesses for CVN 21 applications. Puget Sound Naval Shipyard photo.

The NMC project goal is to reduce top-side weight and lower the center of gravity on CVN 78. An initial solution using 10 Ni steel did not produce the intended results. Instead of ending the project, the Integrated Project Team (IPT), led by NMC, pursued an alternate path—increasing the performance and strength of HSLA-100* steel through heat treatment so that it could be used at reduced thickness, and thus, reduced weight, while meeting performance requirements.

The Future Aircraft Carriers Program Office recently approved the incorporation of HSLA-115 (named for its increased minimum yield strength of 115 ksi) into the CVN 78 ship design conditional upon successful completion of the current project tasks. Ship construction is expected to begin in 2009.

"The project team overcame significant odds in getting an alternate material approved for use on a Navy ship," said Daniel L. Winterscheidt, Ph.D., NMC Program Director. "The team's persistence and outstanding technical work were major factors in demonstrating the feasibility of HSLA-115 for this application. We've improved the processing and capabilities of this steel alloy for CVN 78 and future Navy needs."

By improving the processing and heat treatment of HSLA-115, the team increased the yield strength without compromising toughness, survivability, weldability and formability. The optimization of HSLA-115 processing would not have been possible without the continued support of Mittal Steel USA, the steel producer that provided guidance regarding the manufacturability of the material. The anticipated weight savings for CVN 78 is estimated to be between 100 and 200 long tons.

The IPT includes the Future Aircraft Carriers Program Office (PMS 378), Naval Sea Systems Command, Naval Surface Warfare Center Carderock Division, Navy Joining Center, Northrop Grumman Shipbuilding, Mittal Steel USA, and Puget Sound Naval Shipyard.

The NMC project will continue through February 2010, first certifying a vendor that can consistently and reliably produce the large HSLA-115 plates needed on CVN 78, then providing relevant data on further evaluation that is required for life-cycle management for CVN 78 and future HSLA-115 applications.

** HSLA = High-strength, low alloy*

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