

U.S. NAVY USES PROPRIETARY ATI ALLOY FOR NEW DESTROYER SHIPS

By Stephanie O'Connor



The DDG 1000 is the U.S. Navy's next-generation destroyer ship.

ATI 2003® lean duplex stainless is finding its way onto a new technology on U.S. Navy ships for personnel safety barriers.

The technology is a joint effort lead by Concurrent Technologies Corporation (CTC) in conjunction with a team that included ATI and Applied Thermal Sciences (ATS). The innovative technology design utilizes the economically-produced, high-strength ATI 2003 lean duplex stainless in a new application. ATI 2003 lean duplex stainless has been incorporated into the acquisition program for two new destroyer-class ships now under construction by the U.S. Navy.

The hybrid laser-welded corrugated metallic sandwich panel technology, called LASCOR, was recognized by the Department of Defense Joint Defense Manufacturing Technology Panel with its 2008 Defense Manufacturing Technology Achievement Award.

Key to the success of the LASCOR panels is the alloy from which they are built, ATI 2003 lean duplex stainless, a proprietary alloy whose nitrogen-enhanced chemical makeup provides high strength, which allows the panels to weigh significantly less than solid plates of other metals while remaining cost-effective to produce.

LASCOR panels use a design similar to corrugated cardboard and consist of two sheets of metal welded to a corrugated metal core. They combine the economical features of low-density materials with the high-strength advantages of traditional steel superstructures. Other advantages include a modular panel flexible design for assembly; a lower center of gravity for ship construction when used for topside applications; better life-cycle maintenance costs; enhanced corrosion resistance; and improved flatness.

ATI began working in partnership with CTC and ATS on this project in 2005. CTC operates the Navy Metalworking Center, an organization sponsored by the Office of Naval Research Manufacturing Technology Program, which optimizes advanced metalworking manufacturing technologies, materials, and related processes to improve performance of weapon systems and lower the production costs. ATS is the prime contractor for manufacturing LASCOR berms and personnel safety barriers for the DDG 1000 class of guided-missile destroyer ships.



ATI 2003® lean duplex stainless is used to manufacture LASCOR panels for personnel safety barriers on the DDG 1000 destroyer ship.

“The LASCOR team had been using a different grade of stainless steel when ATI first worked on this project, but it was very expensive,” explains Dave Bergstrom, ATI project manager. “ATI then suggested using another alloy, which was an improvement but cost was still a factor. That’s when ATI 2003 lean duplex stainless was deployed. It has the desired strength and corrosion resistance for the Navy’s purposes.”

ATI worked closely with the LASCOR team to produce ATI 2003 lean duplex stainless in the product forms needed for Navy applications, says Bergstrom. ATS successfully manufactured numerous large (78 x 240-inch) LASCOR panels for a number of structural tests. CTC performed extensive work, which included design for manufacturability, mechanical testing, welding trials, corrosion testing, impact

resistance measurements, and temperature range testing. ATS produced prototype panels that were subjected to intense structural testing, which showed that the panels provided enhanced strength, protection and corrosion resistance for a range of potential Navy applications.

ATS won a multimillion-dollar contract to develop, test and manufacture ship sets of deck edge safety berms and personnel safety barrier panels for the next-generation Navy destroyer, DDG 1000, using LASCOR technology. As a result, LASCOR panels made from the ATI 2003 lean duplex stainless alloy are being procured for use on the DDG 1000 class of ships being built at the General Dynamics Bath Iron Works shipyard in Maine, to satisfy various application and weight requirements while providing a low-cost solution.

“We were looking for new materials because we had been using more expensive materials that were more difficult to obtain,” notes Kevin Stefanick, project manager at CTC. “We started talking with ATI, and they were willing to come up with an innovative approach when cost became an issue. If the product addresses a variety of customer needs and is affordable and manufacturable, it comes around when the application is right and that’s what happened here. The partnership with ATI, CTC and ATS has been very good, and we hope for more partnerships like this one in the future.”

New applications for panel technology in Navy and Army programs are lead by our ATI Defense team. If you have questions or ideas about defense applications, please contact us at 1-877-590-3979 or ATIdefense@ATImetals.com

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