



**National Shipbuilding Research Program
Advanced Shipbuilding Enterprise**

5300 International Boulevard
North Charleston, South Carolina 29418

For Immediate Release

December 10, 2002

BENDER PIONEERS LASOX CUTTING IN PRODUCTION

“It is not often (if ever) that you can claim "first in the world" on anything,” wrote Pat Cahill, R&D Manager at Bender Shipbuilding & Repair Co., Inc., as he proudly announced to his co-workers they were the only company in the world with a production LASOX (Laser Assisted Oxygen) cutting system.

After 10 months of research and development through an NSRP-funded project, the team of Bender Shipbuilding (including Cutting Edge Metal Processing), Alabama Laser Systems and BOC Gases has successfully installed and tested the only production LASOX system. Test cuts performed on November 12th on 1.5" mild steel showed exceptional results and Bender expected to cut production parts as soon as the week of November 18th.

“With our existing equipment we can achieve laser quality cuts through at least 2" steel. Further R&D work has a goal of 4" steel,” said Cahill.

Other team members on this project are General Dynamics Electric Boat and Caterpillar, Inc. Each of these companies will receive the next installment of the LASOX cutting system. Additionally, all have already implemented new laser technologies in production in conjunction with other NSRP projects.

The LASOX process is being developed to enable the cutting of thick steel (50mm min, possibly up to 100mm), using a relatively low laser power (less than 2kW). The LASOX process is an exothermic burning reaction in which the heat of the laser beam is used to bring the steel to ignition temperature, and a specially designed nozzle is used to deliver a supersonic stream of oxygen to the heated spot, resulting in ignition and then sustained burning.

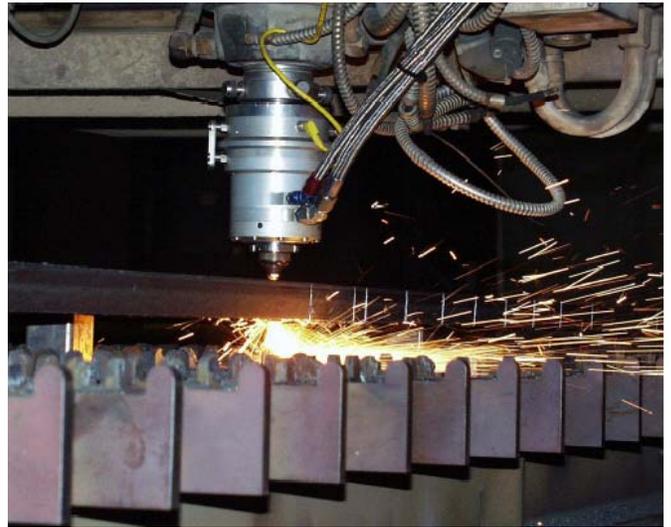
"I am amazed at the cut quality on the parts produced by LASOX. Because of the cut edge surface quality, minimal heat affected zone, and ability to hold very tight tolerances, many post-cutting machining operations can be eliminated. By the way, we are piercing 50mm plate in less than 2 seconds,” said Bob Lewis, General Manager of Bender's metal processing facility.

The final product of the project will be a commercially available LASOX system sold to U.S. shipbuilding and repair companies at a discount. Through commercialization and technology transfer, the project team will provide additional impetus for other U.S. shipbuilders to invest in laser-cutting technology, which has already demonstrated significant benefits at Bender Shipbuilding.

“It doesn't take an Einstein to see that this will allow better, cheaper parts in both military and civilian new builds and repairs and may revolutionize certain types of plate cutting. This is some of the best heavy plate cutting I've seen in my 37 years in the business,” said Lewis.



1.5 inch part cut at Bender



LASOX cutting at Bender

NSRP is a collaboration of 11 U.S. shipyards working with government, industry, and academia to achieve the continuous product and process improvements necessary for the U.S. shipbuilding industry to become internationally competitive, directly resulting in more affordable Navy ships. NSRP is sponsored by the Naval Sea Systems Command. Bender Shipbuilding & Repair Co., a leading ship repair facility in the central Gulf of Mexico for over 75 years as well as a builder of several types of vessels, is a member of and active participant in the NSRP.

Questions about this press release may be directed to the Program Office (Advanced Technology Institute):

Tel: 843-760-3255 Email: house@aticorp.org

Fax: 843-760-4098 Internet: <http://www.nsrp.org>

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