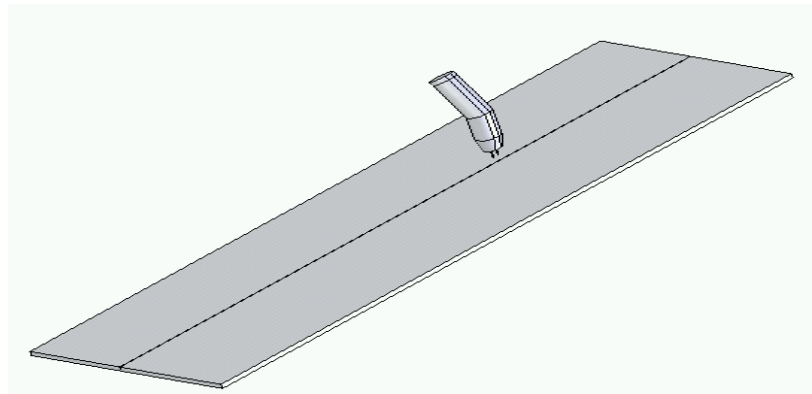


**“Comparison of SAW and Tandem Electrode Gas Shielded Processes for Productivity, and Distortion in Thin Panel Butt Joints for Thin Panel Structures”**

Presented to NSRP SP7 Panel  
Hanover, PA  
April 8 2009



**“Comparison of SAW and Tandem Electrode Gas  
Shielded Processes for Productivity, and  
Distortion in Thin Panel Butt Joints for Thin Panel  
Structures”**

Prime Contractor:

*Todd Pacific Shipyard*

Sub-Contractors:

*NASSCO Shipbuilding, CD-adapco , Weaver  
Engineering, Dwight Laboratories, Machinists Inc.*

Contributing Team Members:

*ESAB Welding and Cutting Products, Wolf  
robotics, Abicor Binzel Corporation  
Parametrix (Dimensional Analysis)*

# Tandem Twin Pulsed GMAW in Dual Head, Double Sided Fillet Welds for Panel Stiffeners with Weldable Primer



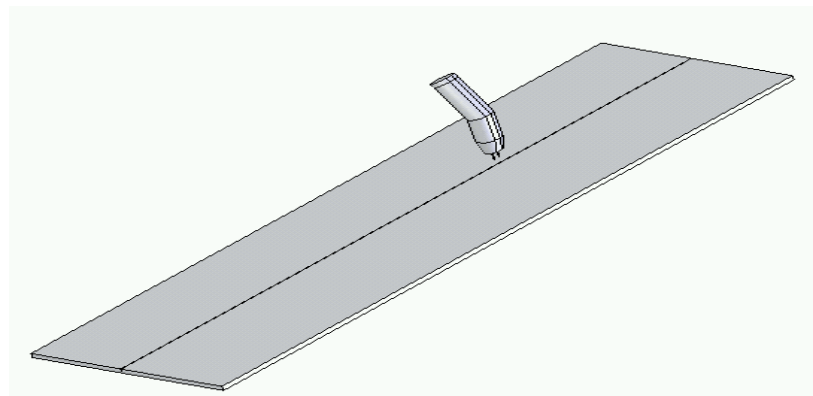
National Shipbuilding Research  
Program  
SP7 Panel Phase I Project  
Final Report  
Submitted to ATI  
ATI Project No: 2007-347  
February 28, 2008

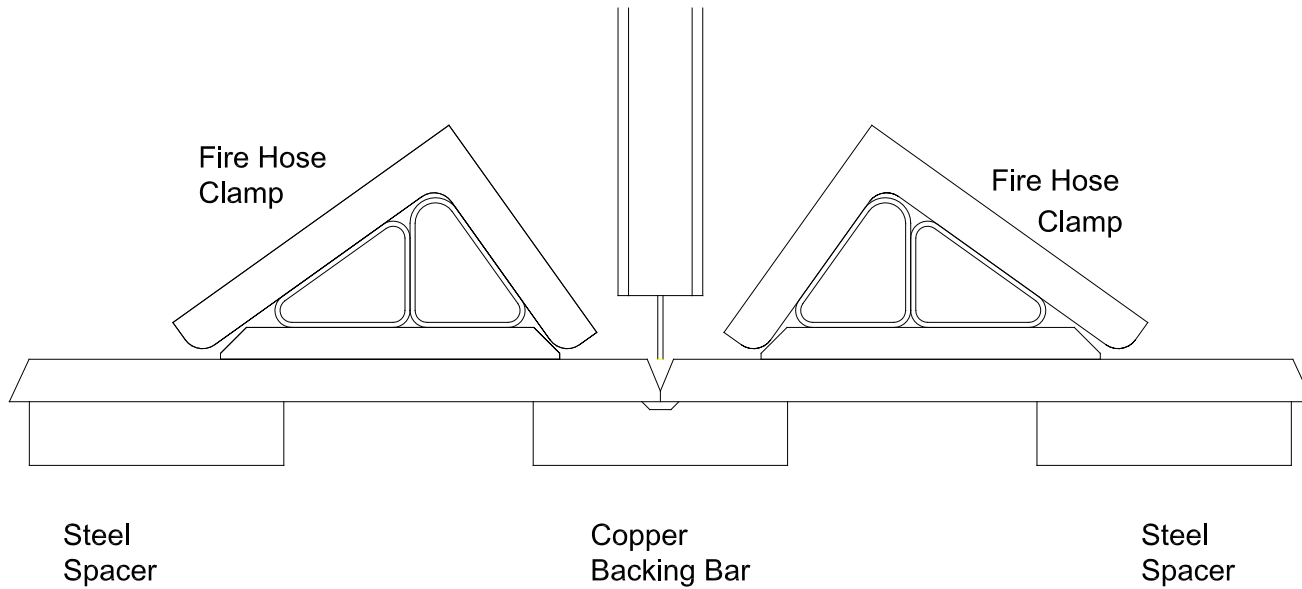
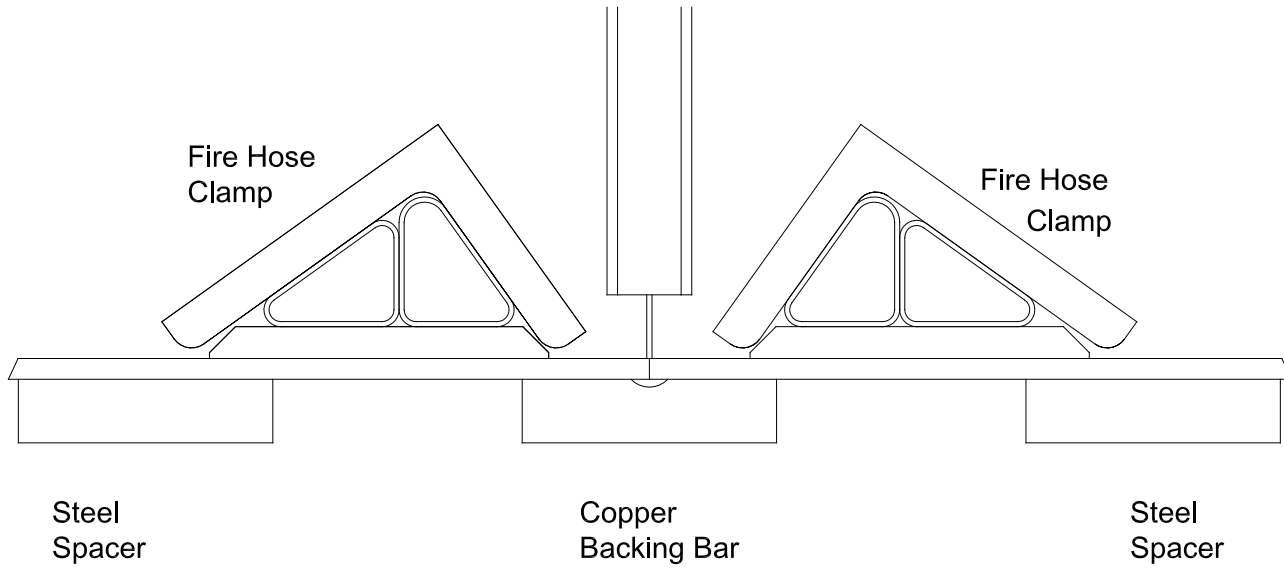
# **“Comparison of SAW and Tandem Electrode Gas Shielded Processes for Productivity, and Distortion in Thin Panel Butt Joints for Thin Panel Structures”**

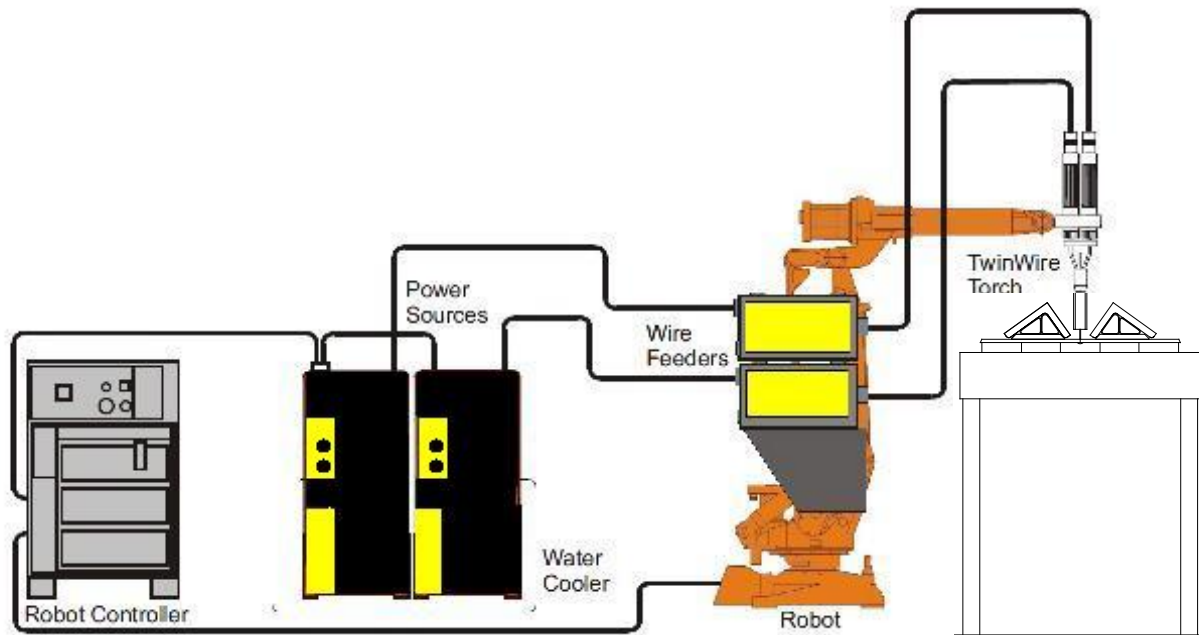
## Concept Description:

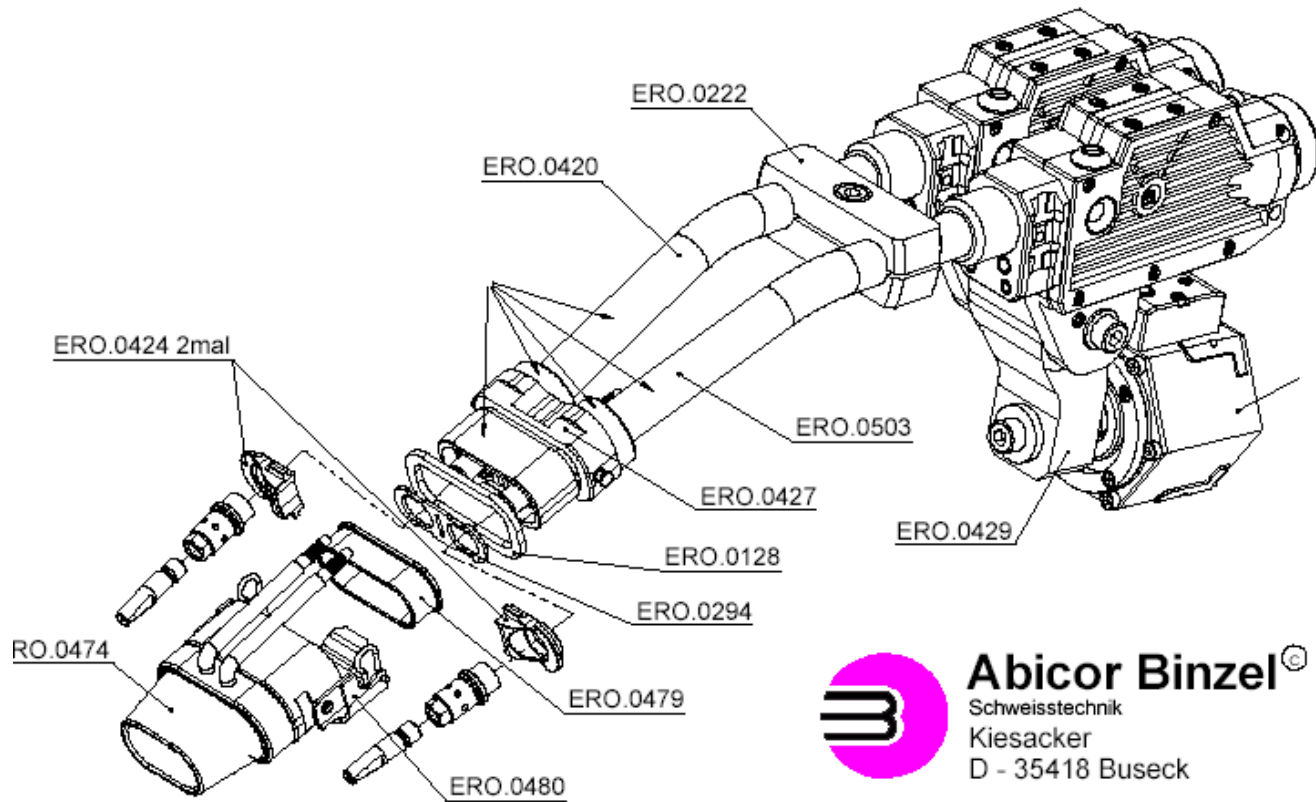
This project will perform a series of weld tests to compare SAW with the TGS process in butt joints on 6mm and 12 mm, 36 ksi steel plate.

Computer modeling of stress–strain and distortion will be developed for the comparison of SAW and TGS.







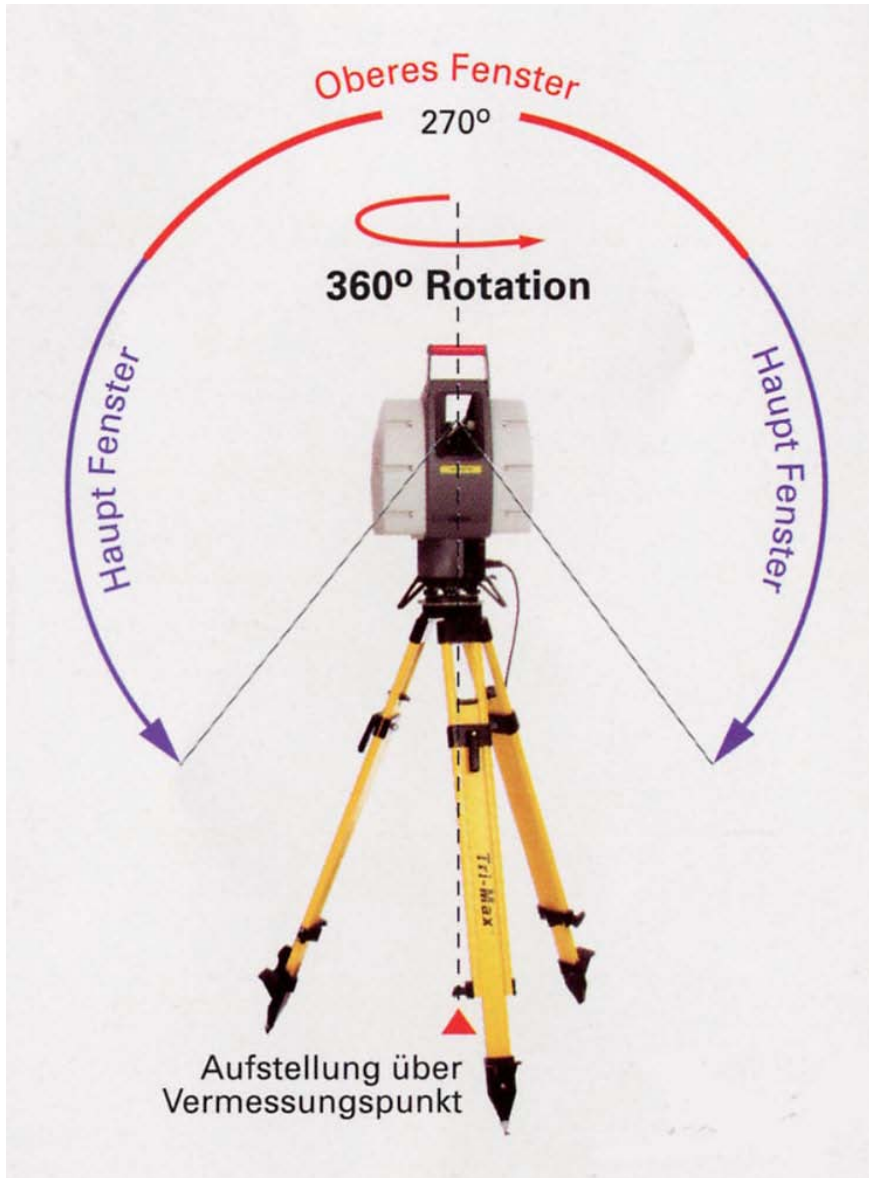


**Abicor Binzel**®  
Schweisstechnik  
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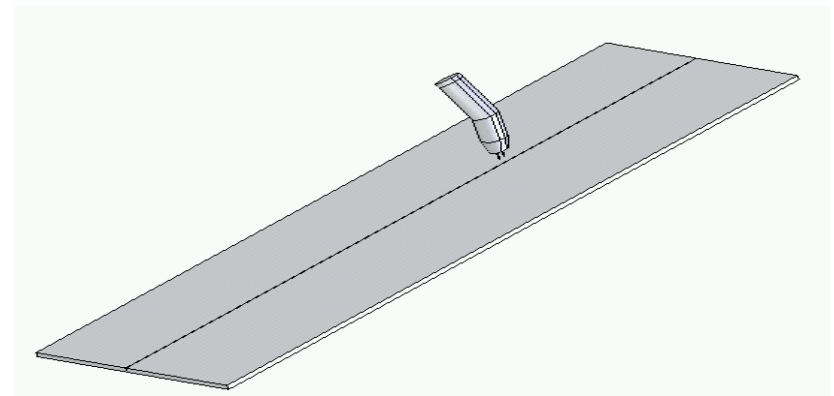
## **“Comparison of SAW and Tandem Electrode Gas Shielded Processes for Productivity, and Distortion in Thin Panel Butt Joints for Thin Panel Structures”**

Project Goals and Objectives:

1. To compare the SAW Process to TGS process. The metrics to be evaluated are: First time weld quality; Heat input; Travel speed, Penetration, and Measured distortion.
2. Develop computer simulations of SAW & TGS to predict distortion and characterize penetration. This will be done using star-CCM+/STAR-CD software by adapting its casting solidification and solid mechanics aspects.
3. Evaluate the distortion trends of TGS in comparison to SAW to see if there are benefits that can reduce rework.
4. Demonstrate that TGS can be qualified for Navy work.



(Dimensional Analysis)



# **“Comparison of SAW and Tandem Electrode Gas Shielded Processes for Productivity, and Distortion in Thin Panel Butt Joints for Thin Panel Structures”**

**Deliverables and Benefits to the NAVY:**For this project, the deliverable to the Navy will be:

1. Reporting of the results of the comparison with the SAW process for first time weld quality, heat input, travel speed, penetration, distortion, fit, and microhardness.
2. Benchmark results for solidification, stress-strain, and distortion simulation of the SAW and TGS process parameters for 6mm and 12mm panel thickness'. Assess the feasibility of penetration prediction based on process parameters
3. Report the benefits toward reducing man-hours for rework due to reduced distortion on panel structures 6mm to 12 mm in thickness.
4. PQR data performed in accordance with S9074-AQ-G1B-010/248 for a selected TGS weld with ½ inch DH-36 plate including charpy tests.

**Thanks**

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