

Welding of Titanium Pipe for U.S. Navy Ships

Application:

- Shipbuilding

Material:

- Titanium CP Grade 2

Welding Equipment:

Power Supply:

- Model 227

Weld Head:

- Model 15

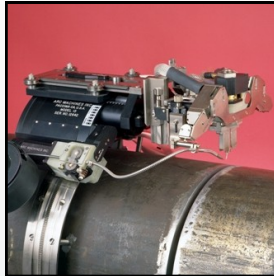
Benefits:

- √ Continuous, non-stop welding through 360°
- √ Improved productivity
- √ 70,00 welds with no leaks found

For further information, call
AMI at 1-818-896-9556 or e-mail
sales@arcmachines.com



Model 227



Model 15



When Northrop Grumman Shipbuilding (NGSB) was awarded a contract by the U.S. Navy to design and construct the first of an anticipated 12 ships under the Navy's LPD 17 program, it specified titanium piping to be installed using both orbital and manual gas tungsten arc welding (GTAW) technology.

Titanium CP Grade 2 was selected by the design team to replace copper-nickel (CuNi) seawater systems, such as ballast and fire main piping, since titanium is virtually corrosion-free in sea water. Titanium is a low density element and has added advantage of significant weight savings when compared to CuNi. The use of titanium results in lighter, more stable, faster, and more maneuverable ship.

Welding procedures were developed both for manual and orbital welding, with orbital welding used on pipe sizes from 6 to 12 in. At the peak of operations, there were a total of 9 orbital welding systems in operation, using **Model M227** power supplies and **Model M15** full function pipe weld heads.

Orbital welding permits continuous welding through 360° since it is unaffected by out-of-position welding. Travel speed is 3 to 4 in./min., and setup time can be saved by mounting multiple guide rings on joints to be welded and jumping from weld to weld. Because a complete pass can be made without stopping, orbital welding proved advantageous on the larger pipe sizes. The total arc time for a two-pass orbital weld on a 12 in. pipe was only 20 min., significantly faster than manual welding. After welding 70,000 ft of titanium pipe with the help of Arc Machines' orbital welding equipment, NGSB has achieved a reject rate of less than 0.15% with no leaks.

To read the full story, visit www.arcmachines.com



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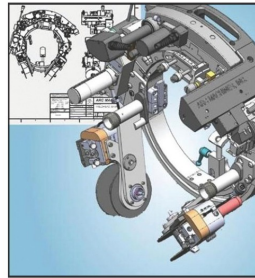
LEADERS & INNOVATORS in Automated Orbital Welding



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and Process Control



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With over 3000 customer relationships in over 50 countries, Arc Machines, Inc. has set the standard for Automated Orbital Welding Equipment for over 30 years, combining Quality and Durability with Innovative Engineering and Design. Around the world, leading manufacturers and contractors rely on AMI for their expertise in automated orbital welding and to develop customized solutions for new welding challenges.

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AMI

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M227 Power Supply

QUICK SPECS

Input Power

100 to 240 VAC
single-phase
50/60 Hz

Weld Current

3 - 100 A DC @ 100/120 VAC input
3 - 225 A DC @ 200/240 VAC input
100% Duty Cycle

Memory Capacity

100 weld schedules maximum,
100 levels per schedule maximum,
100 different passes per level

I/O Device

M-227EMM

Water Cooler

Optional

Dimensions

15" x 23" x 20"
(381 mm x 584 mm x 508 mm)

Weight

88 lbs.
(40 kg)



M15 Weld Head

AVC Stroke

1.75" (44,45 mm)

Torch Oscillation Stroke

2" (50,8 mm)

Wire Feed Speed

5 - 200 IPM

Radial Clearance Range

3.69" (93,73 mm) (Minimum)
depends on pipe diameter,
torch type and configuration

Axial Clearance Range

11.5" (292,1 mm) (Minimum)
depends on torch type and options

- Single or dual wire feeder options are available
- Several torch types are available

