Automated Orbital Welding with Arc Machines, Inc.

Orbital Welding Equipment Contributes to Record-Breaking Performance at the Angra II Nuclear Power Plant in Brazil

Application:

- **Nuclear plant piping**

Material:

- **Type 347 stainless steel pipe**

Welding Equipment:

Power Supplies:

- **Model 207**
- **Model 227**

Weld Heads:

- **Model 15**
- **Model 79**
- **Model 9-1500**

Benefits:

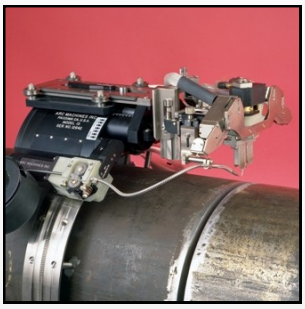
√ **Increased productivity compared to manual welding**

√ **Elimination of defects including porosity and cracking**

√ **Flatter, more uniform crowns**

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

Model 227


Model 15


Model 79

When UNAMON, a consortium consisting of 7 Brazilian subcontracting companies experienced in building nuclear power plants received permission by Siemens to use orbital welding besides manual welding for the installation of the Angra II Nuclear Power Plant in Brazil, they called Arc Machines for their technology and equipment.

UNAMON set up a pipe shop near the Angra II site to perform qualification welds and to prefabricate assemblies prior to installation at the site. The pipe shop welders used 3 Arc Machines Model **M15** and 3 Model **M79** weld heads, both with wire feed, electronic arc gap control, and torch oscillation. 3 Model **M227** pipe welding power supplies fed the weld heads. A Model **M207** power supply and a Model **M9-1500** fusion weld head were used in the pipe shop for operator training and weld qualification for the instrumentation tubing.

UNAMON had experienced difficulty with the Type 347 stainless steel pipe for the primary circuit, the most critical piping system on the site. Grinding of the manual SMAW welds revealed surface micro cracking with a 20% reject rate and prompted an evaluation of orbital GTAW welding for this application. The orbital welds had a flatter, more uniform crown and required very little grinding. They found that the GTAW process eliminated the micro cracking, because of the more uniform controlled heat input compared to manual SMAW.

Orbital welding proved successful in critical situations that would have been difficult, if not impossible with manual welding, clearly demonstrating its potential for improving joining technology in nuclear plant piping installation.

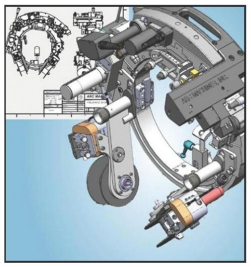
Although the job was behind schedule, when orbital welding began, with Arc Machines' help, the job was finished on time.

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

LEADERS & INNOVATORS
in Automated Orbital Welding

Cutting Edge Narrow-Groove Pipe Welding Technology

Advanced Fusion Welding and Process Control



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ARC MACHINES, INC. 35 Years 1976 - 2011

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.

www.arcmachines.com

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QUICK SPECS

M227 Power Supply

Input Power
100 - 240 VAC service
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)

SINGLE PHASE | 50/60 Hz | 225 AMPS @ 100% | CC

M15 Weld Head

AVC Stroke
1.75” (44,45 mm)

Torch Oscillation Stroke
2” (50,8 mm)

Wire Feed Speed
5 to 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

ARC | OSC | WIRE FEED | WATER COOLING

- Several torch types are available
- Single or dual wire feeder options are available
- Compatible with **AMI Model 415** or **Model 227** power supplies

M79 Series Weld Heads

OD Range
0.750” - 6.625”
(19 mm - 170 mm)

Water Cooled Torch
200 A continuous
Duty Cycle

Head Weight
11 lbs. - 22 lbs.
(5 kg - 10 kg)

Filler Wire Size
0.030” - 0.035”
(0,762 mm - 0,889 mm)

Rotor RPM
0.1 - 2.0

Wire Spool Size
2 lbs., 4” (0,9 kg, 101,6 mm)

Wire Feed Speed
5 - 100 IPM

ARC | OSC | WIRE FEED | WATER COOLING

- Compatible with **AMI Model 415** or **Model 227** Power Supplies