

MAVRIX WELDING AUTOMATION

OEM MANUFACTURER SPECIALIZING IN CUSTOM WELDING SOLUTIONS



American Made, Family Owned and Operated Since 1986

MAVRIX WELDING AUTOMATION

At Mavrix Welding Automation we are the manufacturer, not simply an integrator. Since 1986 Mavrix has been a trusted partner providing solutions to safely and consistently resurface equipment in hardfacing, build-up, joining and cladding industries. We specialize in providing the right solution for your maintenance requirements and as an O.E.M. we manufacture equipment to meet our customers exact needs. Our reputation was founded on the reliability of our equipment and ease of operation. Made in the USA in New Berlin, Wisconsin, you will find our equipment worldwide.

Innovation has allowed Mavrix to meet the growing demands of the industry's we serve. While still providing the popular portable welding automation Mavrix has invested in development of large scale welding lathes, Sub Arc processes, PLC controls and numerous other accessories requested by our customers. Working closely with our customers we incorporate their requirements with our expertise to provide the best equipment for the application. Mavrix believes that automation is key to providing the highest level of productivity and ensuring operator safety and ultimately saving you, the customer, money.

GLOBAL PRESENCE

- AFRICA
- AUSTRALIA
- BELGIUM
- BRAZIL
- COLOMBIA
- CANADA
- ECUADOR
- MAURITIUS
- MEXICO
- INDIA
- NEW ZEALAND
- PERU
- UNITED ARAB EMIRATES
- SAUDI ARABIA
- UNITED STATES

INDUSTRIES

- AGGREGATE
- AGRICULTURE/SUGAR CANE
- CEMENT
- DREDGING
- MINING
- OIL & GAS
- POWER-COAL
- STEEL
- RAIL-CAR
- ADDITIONAL PROCESSES:
including; MIG, Open Arc,
Sub-Arc, Strip Cladding,
Electro Slag, PTA & Metal
spray.

CUSTOMIZATION

While we have many products that are considered standard including the Roll-O-Matic, Impact-O-Weld, Vers-O-Weld, Roll Arc 4000 & Shredder Disc Rebuild systems all require some level of customization to ensure a proper fit with the customer equipment.

For most large scale projects the machines are designed using the customer specific products and then using standard building block we develop and configure the machine that will best suit their needs.

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HISTORY

MAVRIX Welding Automation originated from the Teledyne McKay Company who created the foundation of the products back in the 1950's. The early history of the company involved the design and manufacture of special machines for weld build-up and hard-facing of earth moving, undercarriage equipment and steel mill rolls.

MAVRIX purchased the assets of the Automatic Welding Division of Teledyne McKay in 1986. For the first 20 years the company focused on products that were portable, reliable and easy to use. MAVRIX custom engineers machines for special purpose weld fabrication including sub-arc, welding of rail tank car internal girths with precision level control and integrated systems including metal spray. The product designs are modular in nature and are grouped into typical product families that, in many cases, can be mixed and matched.

In May of 2009, the company was sold and continues to operate as a family owned welding automation company. In 2010, a slight change in our DBA name from Mavrix Automatic Welding to Mavrix Welding Automation was completed to better depict the products we design and manufacture. Relocation of the business in 2013 allowed Mavrix to have 40% more manufacturing space for multiple machine builds and large scale equipment up to 65 feet long.

About the owner: Glen Senger is the owner and President of Mavrix Welding Automaton. After purchasing Mavrix in 2009 he began to work on new product development to integrate new features customers requested. As president and owner he continually works to expand Mavrix globally and be a resource to customers both domestically and overseas. His strategic plan includes increased international market share, continued new product development and most importantly never sacrificing reliability, durability and ease of use.

Prior to purchasing Mavrix, Glen was Director of Engineering at Giddings & Lewis (formerly MAG). His career previous to G&L was at Harley-Davidson for 12 years as a Manager in the Product Development Center and as a manufacturing engineer in the power train operations. During his time at Harley, Senger graduated from Keller University with his MBA and was award Business Plan of the Year for a plan based on engine remanufacture which he later launch at Harley-Davidson Capitol Drive facility. Preceding Harley, Senger spent nearly 9 years at Briggs & Stratton where his love of automation was born. Responsible for engine assembly lines automation was key in keeping cost down, and continues to be his focus at Mavrix.

He is a member of AWS, and was a key note speaker at the conference in Orlando, Florida in 2011 on welding automation. Glen has been highlighted in Manufacturing and Distribution publication, Schneider Electric and Finishing Magazine. He has done voluntary work for the boy scouts of America, and has coached numerous teams in baseball, basketball and flag football, supporting his children and the community through the City of Brookfield Park and Recreation. His leisure activities include playing golf, boating, fishing, remodeling his home and doing an occasional 5K. As a father of five, he is an excellent chef and he and Mary have been married over 25 years.

Mavrix manufactures capital equipment used in a variety of industries. They have standard products for most of these industries and build custom automation for the others.

Aggregate- Crushed stone

Crushed stone or angular rock is a form of construction aggregate, typically produced by mining a suitable rock deposit and breaking the removed rock down to the desired size using crushers. The stone/rock can be roll crushed, cone crushed, or impacted or a combination of all three may be used. Mavrix manufactures machines to weld the crushing/impacting surfaces to maintain the size and extend the life. The equipment is portable and can be taken to the machine. No disassembly is required.

Agriculture – Sugar Cane

Sugar cane mills processes sugar cane to produce raw or white sugar. The shredder mill is the piece of equipment that crushes the sticks of sugar cane to extract the juice. Mavrix manufactures portable equipment the welds the shredder discs to keep the surface rough to improve the shredding process.

Cement

The raw materials needed to produce cement (calcium carbonate, silica, alumina, and iron ore) are generally extracted from limestone rock, chalk, shale, or clay. These naturally occurring minerals are then crushed through a milling process. The milling process known as a pulverizer has a large table and rolls that grinds the raw material until it is a specific size. The grinding process requires the table and roll surface to be welded to maintain the size.

Dredging

Pumps Dredging is an excavation activity usually carried out underwater, in shallow seas or freshwater areas with the purpose of gathering up bottom sediments and disposing of them at a different location. The technique that utilizes pumps for this process require the pump to be welded to restore the internal dimension and maintain the pumps effectiveness.

Mining

Mining is a very broad industry and of which there are many applications for hardfacing. Because it is very broad Mavrix does not have a specific line of equipment to directly service the industry although they build customer system for customers in this industry. Where our product can be found are as follows

- Under Carriage
 - Track Shoes/Grouser Bars
 - Idler wheels
- Skid Shoes
- Grader edges

Oil & Gas

The oil and gas industry is the exploration, drilling and extraction of oil and gas. There are two primary welding applications that Mavrix manufactures equipment for;

- Hardbanding

The process of depositing hardfacing alloys onto drill pipe tool joints, collars, heavy weight drill pipe and other down hole components to protect both casing and drill string assets from abrasive wear
- ID Pipe Welding
The process of depositing hardfacing alloys on the inside diameters of pipes used in the transportation of course material (oil sands).

INDUSTRIES - SUMMARY

Power Generation – Coal

41% of the global electricity is produced by coal fired power plants. The process of converting lump coal into electricity is similar in nature to the cement manufacturing process. The raw coal is fed into a vertical pulverizer mill and ground using a rotating table and rolls. The tables and rolls surfaces wear down and require new metal to be welded (build up) and hardfaced to continue the grinding process. Mavrix manufactures equipment that is portable and allow the tables to be restored to the proper size with disassembly.

Recycling

The recycling industry specifically metal using large shredding machine that impact the items fed into them and reduces them to smaller sortable pieces. The downstream system sort out the various materials for sale are raw materials. The shredding machine requires the disc surface to be welding to extend the life of the rotor

Steel Manufacturing

In this industry Mavrix manufactures equipment to customer who re-manufacture equipment that is used in the continuous casting process. The welding equipment is custom designed and manufactured for the specific products being welded. Caster rolls are machined to remove the worn surface and then welding to put a fresh layer of metal. The welding processes can be very diverse including MIG, Sub-Arc and Open Arc.

Transportation - Rail

In the transportation industry specifically rail car manufacturing Mavrix manufactures a welding system that is used to join the rail car segments by welding the inside diameter.

Product Characteristics

- MAVRIX products are capital equipment and while targeted at a specific industries and applications results in some level of customization to fit the end users machine. We offer standard pricing for variation of the machine and include the customization as part of the order.
- Our products perform metal buildup, cladding & hardfacing, a process that is used to refurbish machinery that grinds, crushes & pulverize material and in the process the surfaces wear down. Unlike fabrication equipment which joins two items together our equipment simply applies additional material to the surface to enable the end user to put it back in service and in most cases without disassembly.
- The product is not a commodity and as such is not a good candidate for a distributor to purchase and hold for sale.
- The product is a non regulated product and requires no export licensing.

Product Development

The products are a mature designs that have been in production for decades and have been sold throughout the world. New product development results from customer requests and are integrated into custom manufactured equipment for the first time. Recent new products include pressurized flux hoppers, servo oscillation, integrated heat shrouds, multiple head machines, strip cladding, PLC controls, flux conveyors, & servo wire feeders.

Development for export markets will include changes to controls to meet local standards and available voltage and frequency. In most markets this is limited to a transformer. The in country evaluation will be used to further understand the specific codes require.

PROCESSES

MAVRIX WELDING AUTOMATION PROCESSES

Mavrix manufactures machines that can use most common welding processes. In some cases we can use the same torch to weld FCAW, SAW and GMAW with small front end changes on the torch. Review processes for more information.

OPEN ARC-FCAW

Nearly all of the portable equipment manufactured by Mavrix uses **Flux-cored arc welding (FCAW or FCA)**. FCAW requires a continuously-fed consumable tubular wire containing flux. The consumable is typically supplied on 60# coils or in tubs or drums of various size. The process is done with constant-voltage. The flux itself is relied upon to generate the necessary protection from the atmosphere, producing both gaseous protection and liquid slag protecting the weld. The process is widely used in hard facing and metal build up because of its high welding speed and portability.



Many flux cored wires contain more than just flux, it also contains various ingredients that when exposed to the high temperatures of welding generate a shielding gas for protecting the arc. This type of FCAW is attractive because it is portable and generally has good penetration into the base metal. Also, windy conditions need not be considered. Some disadvantages are that this process can produce excessive, noxious smoke and appropriate operator protective must be considered.

SUB ARC-SAW

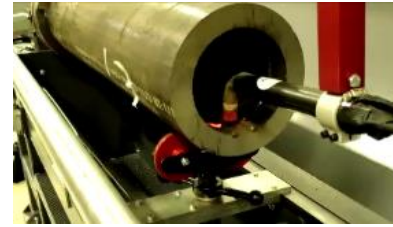
Submerged arc welding (SAW) is a common process that can be added to any of Mavrix fixed automation product. The molten weld and the arc zone are protected from atmospheric contamination by being "submerged" under a blanket of granular fusible flux consisting of lime, silica, manganese oxide, calcium fluoride, and other compounds. When molten, the flux becomes conductive, and provides a current path between the electrode and the work. This thick layer of flux completely covers the molten metal thus preventing spatter and sparks as well as suppressing the intense ultraviolet radiation and fumes that are a part of the shielded metal arc welding (SMAW) process.

MIG-GMAW

Gas metal arc welding (GMAW), sometimes referred to by its subtypes **metal inert gas (MIG) welding** or **metal active gas (MAG) welding**, is a welding process in which an electric arc forms between a consumable wire electrode and the workpiece metal(s), which heats the workpiece metal(s), causing them to melt, join or create a buildup layer or hardfacing layer. Along with the wire electrode, a shielding gas feeds through the welding gun, which shields the process from contaminants in the air. A constant voltage, direct current power source is used with all Mavrix GMAW welding systems.

ID BORE

The process of ID bore welding is most often complicated simply by the diameter and reach inside the part. Mavrix can manufacture automation that uses FCAW or GMAW in various bore size and reach. We have designed and implemented a FCAW welding lance that is 11 feet long and used to hard face 3" ID pipe.



PTA

Mavrix has implemented PTA on a variety of machine platforms. The customer is able to select what PTA equipment is used and the machine control is then integrated to work with the arc starting in the PTA process. Plasma transferred arc (PTA) hardfacing is a versatile method of depositing high-quality metallurgically fused deposits on relatively low cost surfaces. Soft alloys, medium and high hardness materials, and carbide composites can be deposited on a variety of substrates to achieve diverse properties such as mechanical strength, wear and corrosion resistance.

METAL SPRAY - TWAS

Arc Spray is the most productive and economical of all thermal spray coating systems. Arc Spray uses DC power to energize two conductive wires: one positive and the other negative. These energized wires are then fed through a feeder into a gun head. It is at the gun head that the wires meet and arc against each other, thus creating molten material. Ordinary dry compressed air is introduced into to the arc zone, atomizing the molten material into tiny droplets while also propelling them toward the prepared part. As the droplets hit the work piece or part, they flatten out and make splats. The splats interlock one on top another to create an extremely strong mechanical bond.

SUBMERGED ARC STRIP CLADDING *

Submerged Arc Strip Cladding utilizes an arc that runs back and forth at high speed along the strip, depositing weld metal onto the base material. Because this is an arc process there will be penetration into the base material resulting in dilution levels of ~ 20%. Deposition rates are in the region of 10/12kg/hr. for 60mm strip and are restricted by how much current can be applied. Care must



ELECTOR SLAG – ESW *

Electro Slag Strip Cladding (ESW) utilizes a conductive flux and the resulting Joule heating effect to melt the strip into the liquid slag; which is transferred into molten metal deposited onto the base material. The ESW process has significant advantages over its SAW counterpart. As there is no arc present, there is limited dilution into the base material, typically 10% (compared with 20% SAW for 60x0.5mm strip). This can be further enhanced by tailoring flux type and deposition technique. Leading to the ability to deposit single layer full chemistry with over alloyed strip. Higher current levels can be used giving deposition rates of 22-25kg/hr. for 60mm strip. (SAW 10/12kg/hr.)

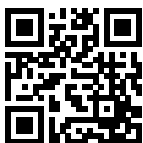
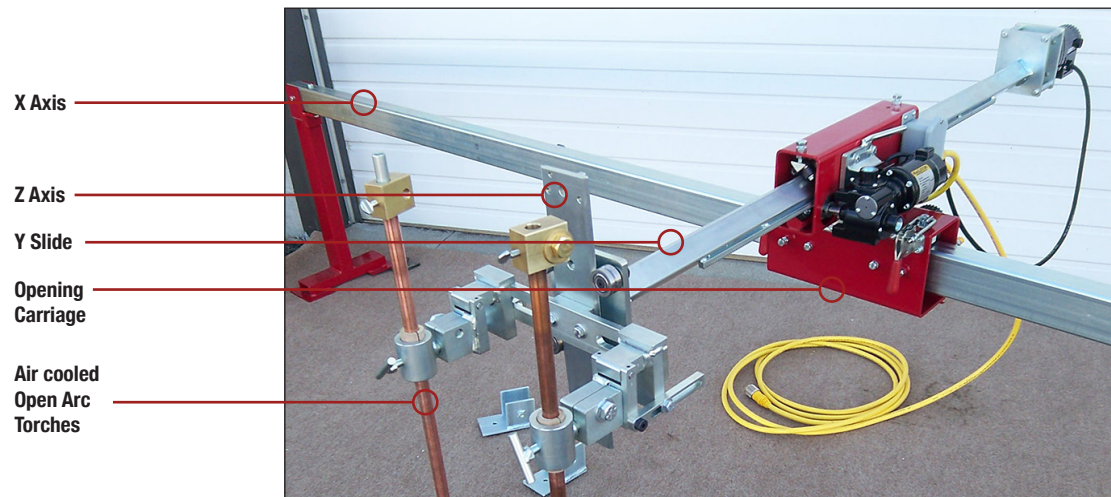
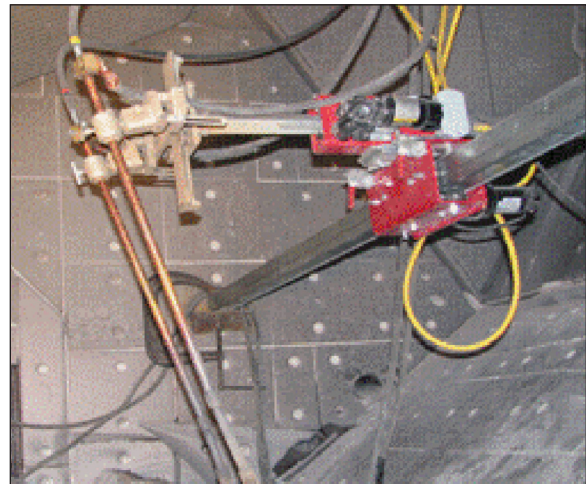
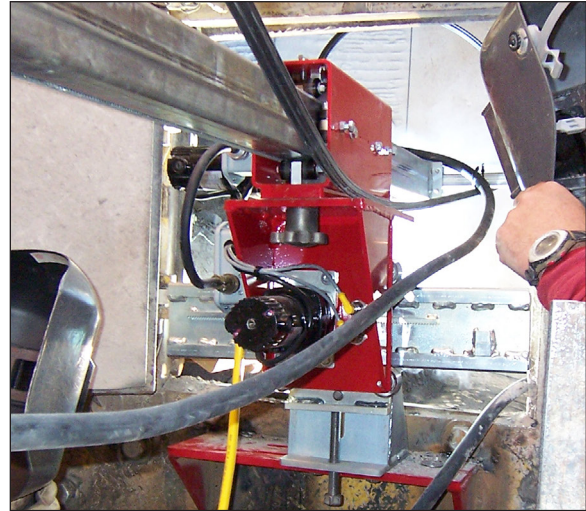
Mavrix manufactures two primary types of aggregate welding system. The Impact-O-Weld line of equipment for impeller bar crushers and the Roll-O-Matic for two and three roll crushers.

IMPELLER BAR REBUILDING SYSTEM

The IMPACT-O-WELD series has nine model variations to meet the customer's application requirements. All machines sold will go through development of a 3D model to provide a clear image of how we can reach the bars to be welded.

Typical Content:

- X-Y Axis dual motorized carriage assembly
- Full X-Y-Z motion possible
- Custom fit X-Axis travel beam
- Weld arm assembly In/out motion
- PA-10 (4) Roll Wire Feeder
- Adjustable Weld Nozzle Option
- Mounting leg options
- IOW Control system with Pendant
- Single or dual torch



AGGREGATE



ROLL CRUSHERS

The Roll-O-Matic can be used to rebuild two or three roll crushers by directly mounting to the outside using mounting plate provided.

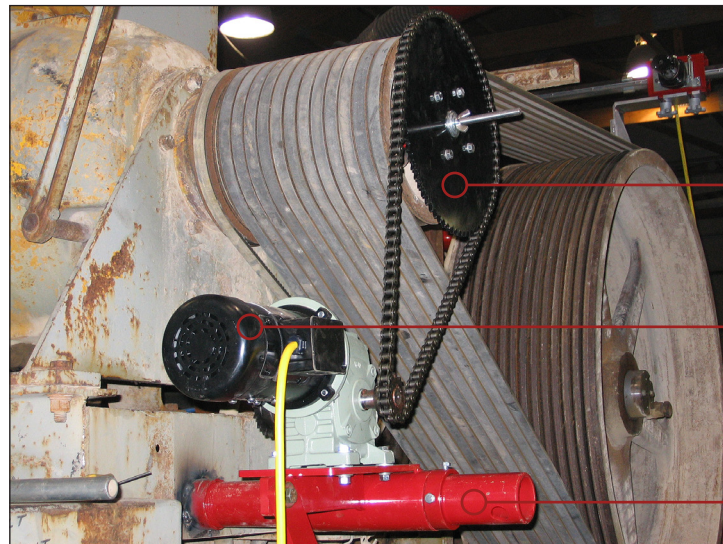
Standard content includes:

- Rack & pinion drive weld arm carriage
- Structural steel weld arm with extension
- Torch angle adjustor and air cooled open arc torch
- PA-10 (4) roll heavy duty wire feeder
- Turn table or coil wire delivery system
- Rotation drive system with welding ground and trip switch



ROLL-O-MATIC 130 CONTROL

A pendant control for ease of operation while maintaining a safe working distance.



10 Ft. of chain, sprockets and mounting hardware provided

1/2 HP 90 VDC drive motor

Pivot mounting system provided

Run/Standby: Starts and stops the power supply and welding process.

Timer: Controls the step over time or roll index with striping.

Mode: "Wrap" mode is used for circumferential welding to build up the body and ST or strip time is used for putting down longitudinal stripes

Crusher Drive: Controls the speed at which the roll is indexed or is rotating during a circumferential wrap.

Carriage: Controls the speed of the carriage motor during step over or stripe mode. Speed and time controls step over size.

Wire Feeder: Controls the speed of the wire feeder and ultimately the amperage.

AGRICULTURE – SUGAR CANE



AUTOMATED SYSTEM FOR ARCING OF SUGAR MILL CRUSHER ROLLS

The Mavrix Roll Arc is an automatic system for arcing “Chapisco” during the shredding process. Designed for use in the mill the machine can be adapted for use in the weld shop to produce the underlay surface and “Picote” when the optional servo wire feeder system is purchased.

Overall weight is approximately 155 lbs (70 kg) with the heaviest individual component weighing 44 lbs (20 kg). The system can be easily relocated from one location to another by one person.

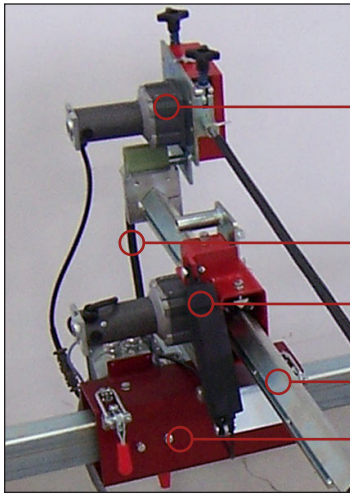
Benefits:

- Lower consumable consumption by as much as 75%.
- Reduced time (Properly arc a roll on two faces in as little as 2 hours).
- One operator can operate two (2) Systems.
- Repeatability – No variation in pattern.
- Improved health and safety - removes operator out of hazard area of fumes etc.
- Can be used in the mill or out.

————— COMPONENTS ▶▶▶



AGRICULTURE – SUGAR CANE



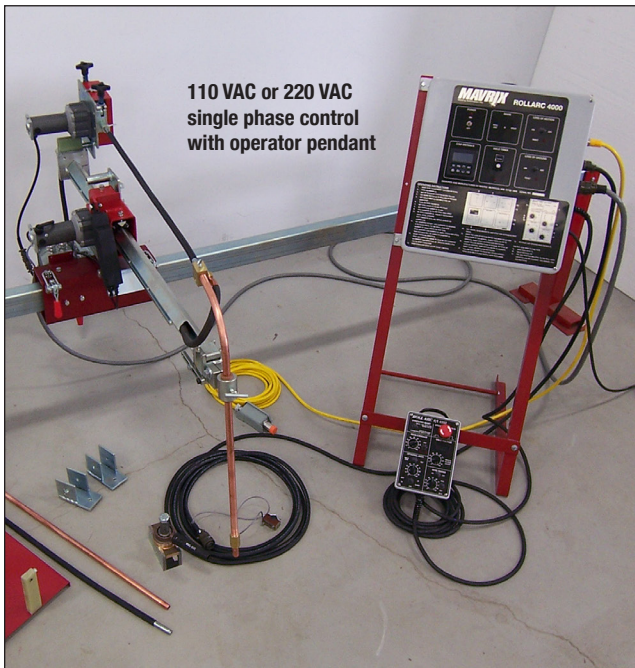
Sealed Wire Feeder

Weld Arm motion in/out

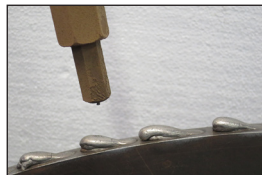
Weld Arm Tilt Cylinder

Opening Style Carriage for ease of assembly

Steel base for 60 # coils



110 VAC or 220 VAC
single phase control
with operator pendant



OPTION

An optional programmable servo wire feeder can be used outside the mill in a dry environment to create the "Picote" or hooks on the edge of the disc.

SYSTEM COMPONENTS

MAIN CONTROL

The main control with operator pendant. Simple to use distance based programming.

WIRE FEEDER

The PA-11 heavy duty sealed (4) roll feeder allows continuous, positive feeding of arcing wire. Drive rolls are covered for protection from moisture and crushing residue during operation.

WELDING TORCH

An open arc torch requiring no shielding gas and no water cooling and is rated for continuous welding at 600 amps. The torch has mechanical angular and rotary adjustment.

WELD ARM

The weld arm is fully automatic with in-out axis of 800 mm plus pivot axis through 45°, all controlled electronically from the pendant.

PENDANT CONTROL

Provided is a compact sealed enclosure that allows the operator remote and close-up adjustment of the weld centering, inching, weld direction, carriage speed, wire speed (current) and weld voltage. All functions may be adjusted during operation and are integrated with the welding power supply contactor.

MAIN BEAM

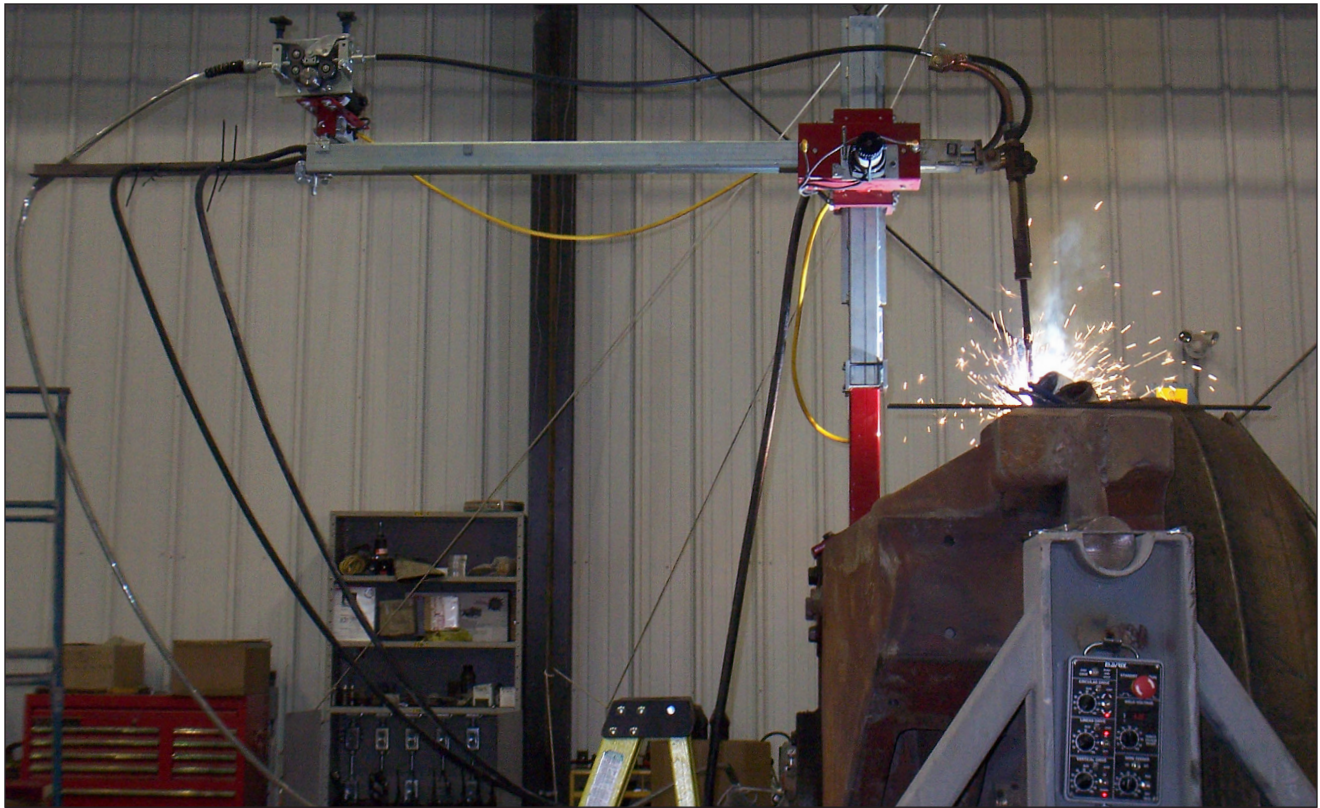
High strength, blue zinc plated main beam with precision engineered drive rack is supplied for corrosion protection. Beam mounting is by U-Shaped brackets to customer supplied mounting points.

MAIN TRAVERSING CARRIAGE

The main carriage is fitted with variable speed DC gear motor using a rack and pinion drive. Motor has an encoder to give infinitely adjustable pitch settings with precision and repeatability. Motor and encoder are fitted with an additional cover giving extra mechanical protection and water proofing.

LOSS OF MOTION

A loss of motion sensor provides information to the control to alert the system of a mill stoppage and shuts down automatic welding.



ROLL WELDING SYSTEMS

The post style system provides a single post for roll welding with Y/Z axis motion. This system is specifically designed for metal build up on rolls that have been removed from the roller mill and placed in a stand manufactured by the customer that has turning capability. For tables a set of posts are typically used to reach from the door opening into the table.

- Single post system provides 2 axis of motion
- PA-10 (4) roll wire feeder with forward and reverse inching
- Auto Pak 1000 lb. capacity wire feeding system
- 120 VAC control system with pendant controls roll rotation speed, weld arm extension, wire feeder, step timer and vertical height adjustment. Includes a step over switch to provide a signal to the torch arm to automatically step the arm
- Contactor cable provide remote voltage adjustment and start and stop function
- Capable of circumferential and longitudinal welding
- Structural steel weld arm carriage with integrated cam roller guide bearings
- Structural steel weld arm 84 inches long with 60 inches of travel with the wire feeder mounted on the back of the arm
- Torch assembly with rotation, tilt and height adjustment capability
- ½ hp. motor and gearbox for roll rotation. Onsite installation required by customer during machine installation and training

Other variations of the post type systems are available.



CEMENT

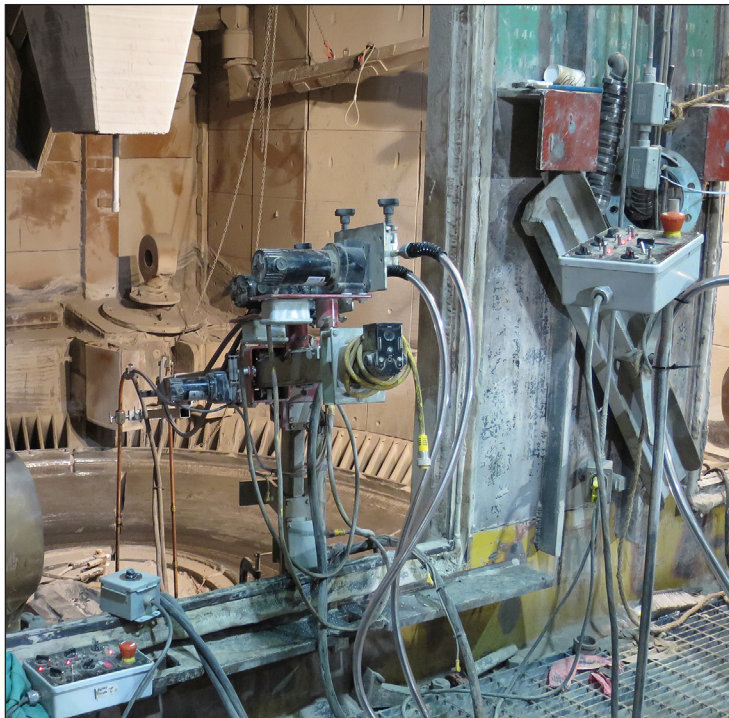


TABLE WELDING SYSTEM

Table welding systems can be designed with a rotational gear head to allow the torch to sweep along a curved bowl profile. For flat profiles the gearhead is removed.

Photo features:

- 84" welded structural steel weld arm
- 10" adjustable torch
- Single or dual torch per arm assembly
- Rotary gear head for torch sweep motion
- Angular carriage adjustment
- Vertical carriage motion with mounting plate
- PA-10 (4) roll heavy duty wire feeder
- 1000 lb. capacity turn table
- Operator pendant for complete process control
- Optional table speed compensation



Oil and gas applications can typically be grouped into **"Drilling Exploration"** and **"Pipeline Transportation"**. The processes and equipment used in most cases are custom engineered for the specific application. Applications include hardbanding drill collars, creating wear pads on mud motors, or applying overlay on mandrel bars.

**Regardless of the welding process or motion,
Mavrix machines are capable of meeting the requirements.**

DRILLING EXPLORATION

DOWN HOLE TOOLS

Drill Collar / Tool Joints / Stabilizer

- FCAW
- GMAW
- PTA

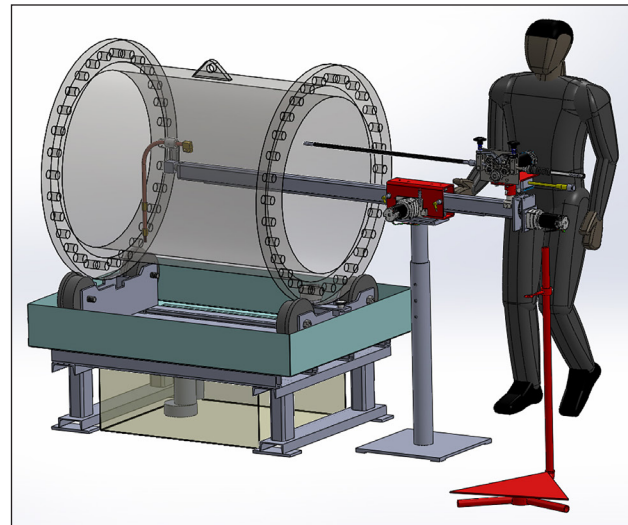
BOTTOM HOLE ASSEMBLY AND PIPELINES

Mud Motors, Mandrel / Pump Impellers /
Ball and Gate Valve

- GMAW
- PTA



Welding Lathe for Mud Pumps



Flange Pipe Section ID Welder, Circumferential or Longitudinal



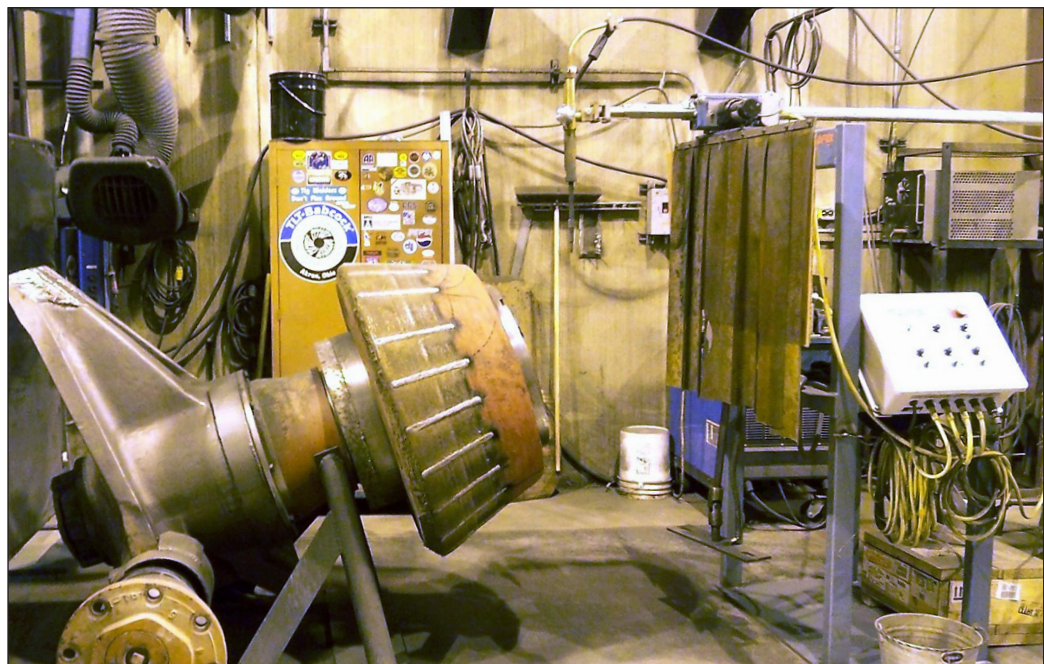
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POWER GENERATION

Coal pulverizer systems for resurfacing rolls comes in many variations. These variations are fully customizable for any application. Mavrix can build a system that will turn the roll or can be integrated with your motor & gearbox.

FREE STANDING ROLL RESURFACING SYSTEM

- Easily adjustable travel limits
- Weld in circumferential mode or strip mode
- Use to fill in break out sections
- Includes a 10 inch travel fully insulated adjustable weld nozzle
- Includes the PA-10 (4) roll constant speed wire feeder with forward and reverse inching and dynamic braking to eliminate wire coasting
- Includes either motor/gearbox drive shaft or control of remote mounted motor/gearbox
- Includes rotary ground on the stand or mounted on the roll
- Mavrix Roll-O-Matic 125 controller (shown) or optional 130 controller with operator pendant
- Autopak wire dispensing for pulling wire from drums



POWER GENERATION



COAL PULVERIZER TABLES

- Automatically rebuilds pulverizer table in place
- Dual torch system capable of up to 50 to 60 lbs. per hour
- Operators are remote from welding arc assuring the highest level of safety
- Designed for quick and easy setup
- System can be sold as a double torch (as shown) or a single
- Unit can be configured to weld curved bowl table typical of MPS design

PULVERIZER TABLE REBUILD SYSTEM COMPONENTS

TWO WELD ARM MANIPULATORS – (single arm available)
Structural steel weld arms with rack and pinion drive.

SUPPORT SYSTEM

A lightweight 3" x 6" aluminum extrusion beam is mounted across the opened pulverizer door.

GROUNDING DEVICE

A 1500 AMP rotary ground device is included and installed by the customer to the table center.

WIRE FEED ASSEMBLIES

The PA-10 (4) roll wire feeder is included with our Auto-Pak turntable.

OPERATING CONTROL

Two identical operating controls are supplied, one for each manipulator. An interconnect cable is used to provide the trip switch signal to both controls for dual arm systems.

STEP-OVER SWITCH

This switch is used to signal the weld arm carriage motors to step after each revolution of the table.

TABLE ROTATION DEVICE

A gearmotor with sprockets and chain are included.

WELD POWER SUPPLIES AND CABLING

Optional

TORCH ADJUSTORS

A torch adjustor will provide + 5 inches up and down motion.

Optional Z motion

Provides remote torch height adjustment.

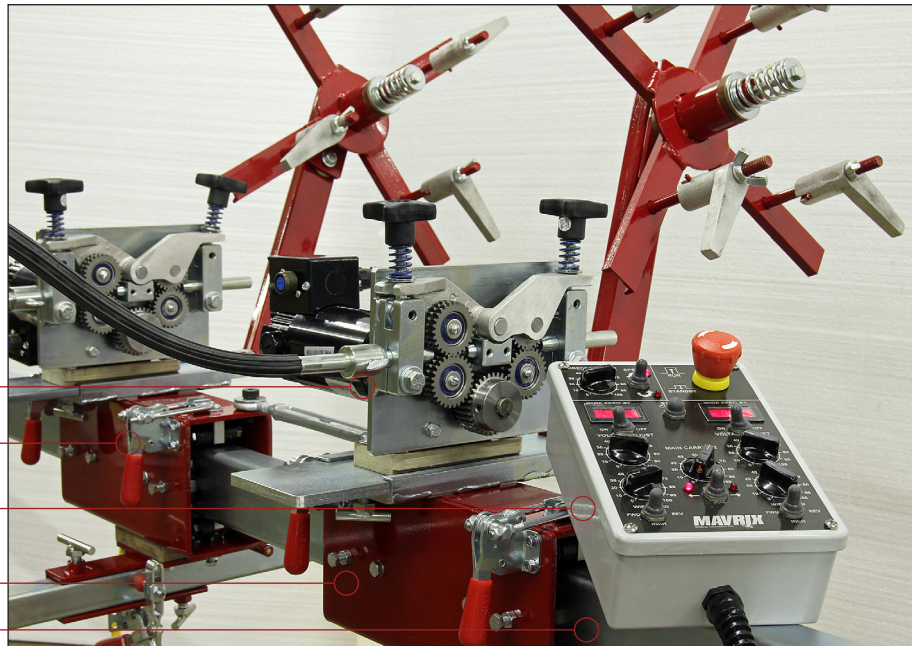
Wire Feeder &
60# Coil Reel

Slave Opening
Weld Carriage

Operator Pendant

Motorized Opening
Weld Carriage

Travel Beam



CAR SHREDDER REBUILD SYSTEM COMPONENTS SERIES 130

The rotor disc welding system is used to maintain the OD of the rotor extending the life of the assembly 2 to 3 times. Features of the system include:

Motorized Carriage Assembly:

A 90 VDC gearmotor and a rack and pinion system provides the carriage motor for the driver and driven carriages.

Travel Beam:

The travel beam is a 2" x 3" structural steel custom made to fit your shredder. Two support legs and mounting pockets are provided for quick system assembly.

Wire Feeder:

The PA-10 (4) Wire Feeder is mounted atop the motorized carriage assembly. 60 lb. coils of weld wire install on the wire reel provided.

Rotor Rotation Gearmotor:

A ½ HP motor and gearbox provide the rotor rotation. Chain and sprockets provide the proper rotation speed.

Control with Operator's Pendant:

Main control contains the main circuit board and motor drives. The pendant is hard wired to the control. The entire machine runs using a single 120 VAC 15 amp circuit.

Trip Switch:

A trip switch is mounted on the rotor drive plate and provides a signal once per revolution to step over the carriages.

Rotary Weld Ground:

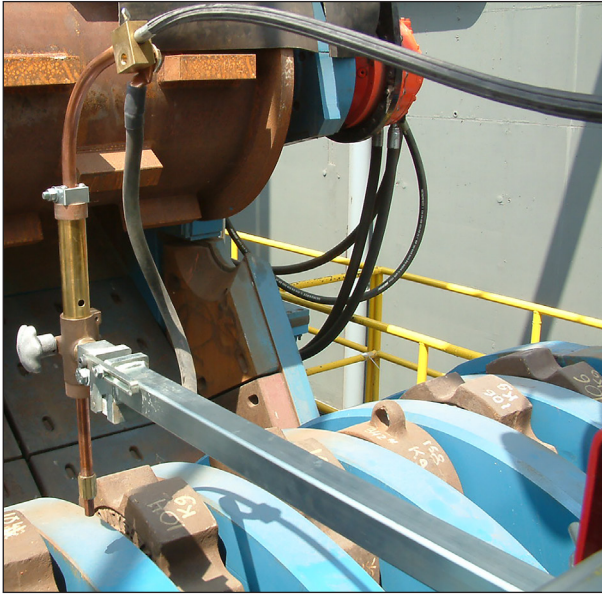
An 800 amp or 1500 amp rotary weld ground is provided and is welded to the primary drive plate.

Weld Nozzle Assembly:

The weld nozzle "Torches" are manufactured from heavy wall copper and use an internal spring liner. The torch provides 5" of vertical adjustment.

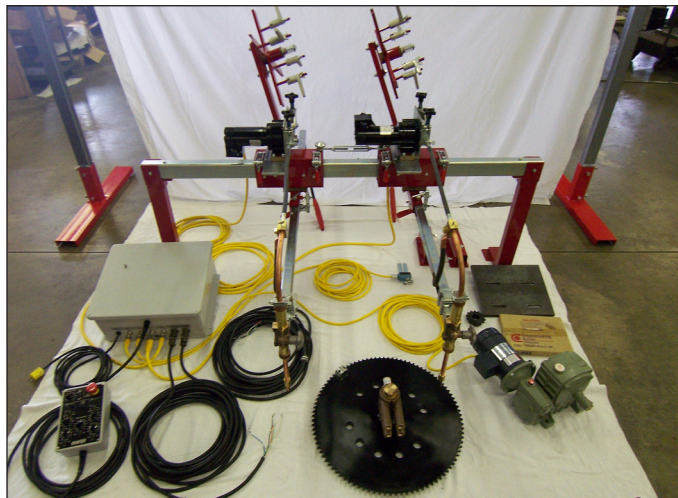
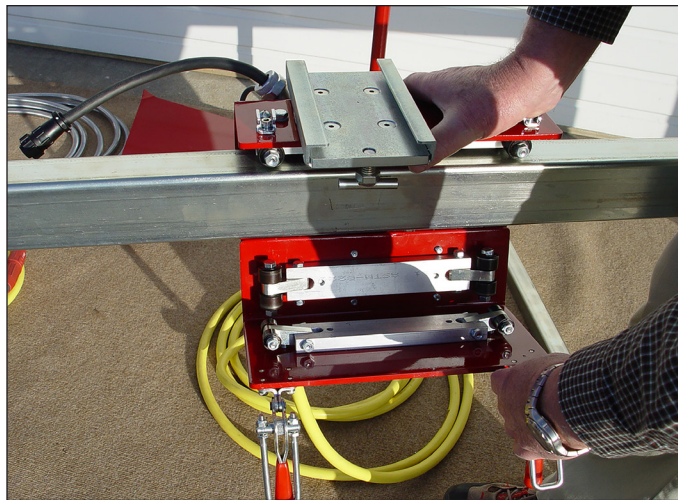
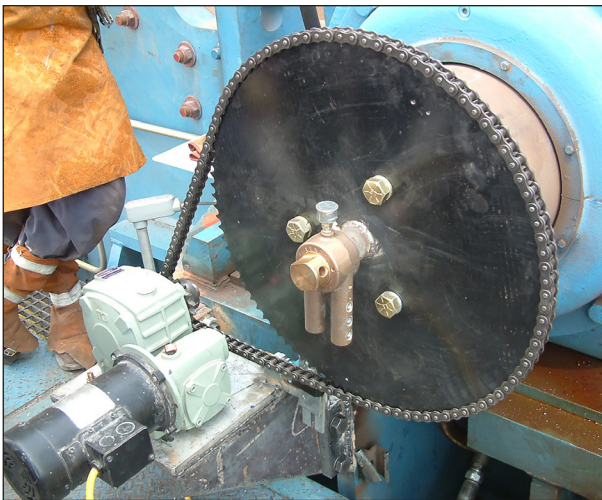


RECYCLING



SHREDDER DISC MAINTENANCE

- Extends the rotor life 2 to 3 times
- Consistent maintenance of the rotor maintains proper roll size
- Automatically rebuilds shredder discs in place
- Cuts welding costs 60% - 70% over stick electrodes
- Deposits up to 25 to 30 pounds of weld metal per hour per torch
- Opening carriage design allows the system to be installed by a single operator
- Remote pendant operation allows the operator to be clear of welding arc, assuring maximum comfort and safety



STEEL MANUFACTURING

Products for steel component remanufacturing are custom engineered and manufactured for each application. Mavrix's designs enable the customer to weld chock, rolls and mandrels using a variety of welding processes. Capabilities include:

- Open Arc Welding – Air cooled or water cooled torches
- Sub Arc Welding – Air cooled or water cooled torches
- Gas Shielded – Air cooled or water cooled torches (Includes pulse MIG)
- ID Bore welding with skip keyway function
- Mechanical or Servo Torch Oscillation
- Electro Slag & Strip Cladding

BEARING JOURNAL WELDER

- Dual independent circuit board based controls
- 32 Foot long – 2 piece bed section
- (2) Rolling/clamping headstocks with adjustable center tailstock module
- Dedicated journal and face welding
- X/Z carriage motion
- Circumferential weld motions with step over
- (4) 16 Inch 3 jaw chucks
- Thermal growth clamp compensation



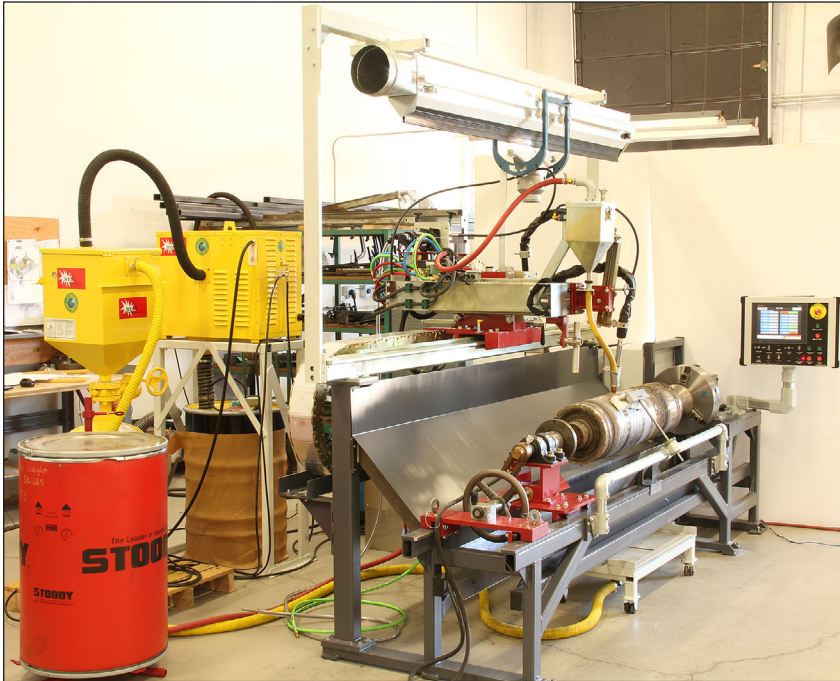
MANDREL BAR WELDER – 56 FOOT

12-Head Sub Arc Lathe manufactured using the VOW 45 open carriage design. Designed to preheat within the machine and provide individual control for each weld head.

- 12 individually controlled weld heads
- 12 Mavrix PA-10 4 roll heavy duty wire feeders
- 12 Mavrix sub arc flux nozzles
- 12 Mavrix on board pressure fed flux hoppers
- 20 Inch 4 jaw manual chuck
- Water cooled chuck adapter shaft
- 6 integrated grounds at the headstock
- 102 Belch Fire burners on 7 manifold assemblies
- 12 Steady rest assemblies with screw adjust and cover system, 28,000 lb. capacity
- 3 inch insulated front and back walls
- 23 - 2 inch insulated retractable covers

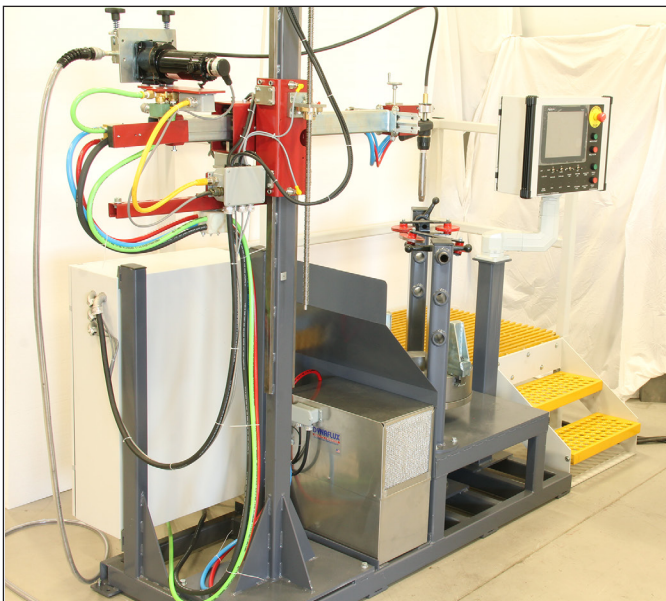


STEEL MANUFACTURING



MULTI PROCESS HORIZONTAL LATHE

- Open Arc, Sub Arc & MIG using a single torch
- PLC based control with open program naming convention. 12" Color HMI
- Pressure feed flux delivery and vacuum recovery
- X/Y/Z Carriage assembly available
- ID bore welding torch on board for rapid change over
- Servo Oscillation



MULTI PROCESS VERTICAL LATHE

- Small bore water cooled MIG torch
- PLC based control with open program naming convention. 12" Color HMI
- Y/Z manipulator post
- Operator platform for ease of observation



ELECTRO SLAG & STRIP CLADDING

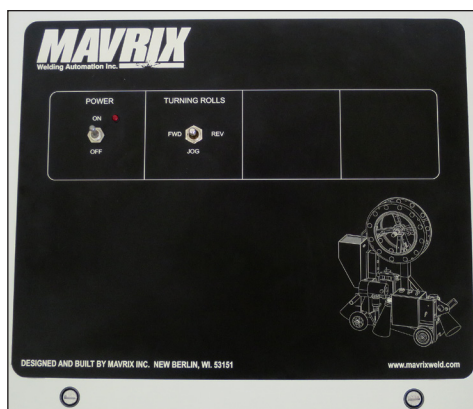
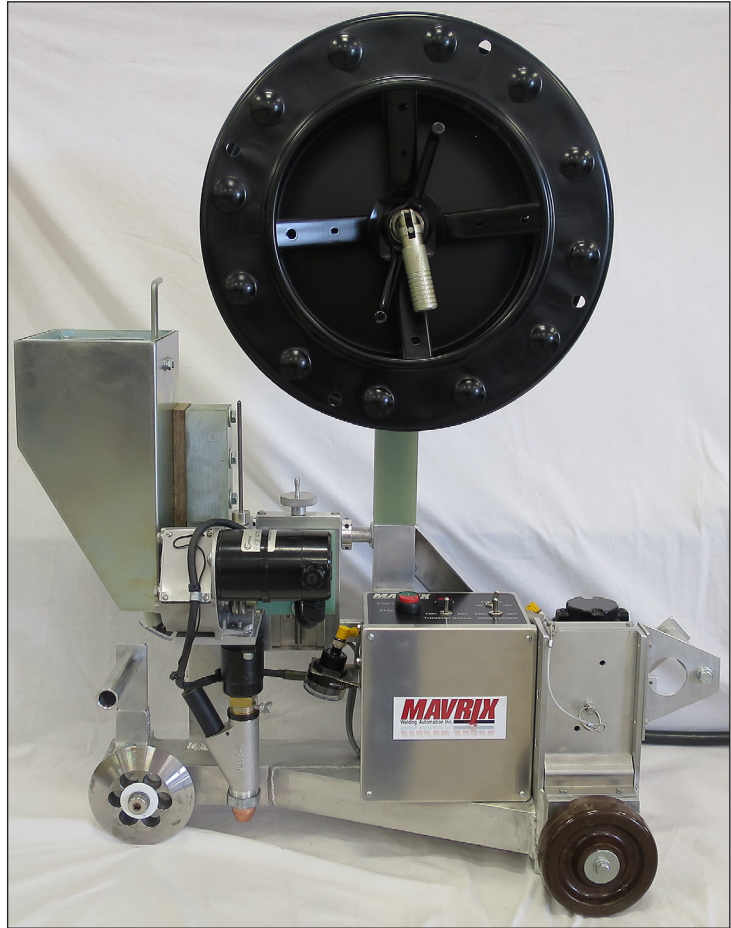
- 30mm & 60mm designs
- Common upper feed head with interchangeable lower strip head
- Electro Slag or cladding welding processes
- Drive roll for Lincoln or ESAB feed motors
- Full length insulated drive shaft for long feed roll life

TANK CAR CLOSING SEAM WELDER

The closing seam tank car welder is a rugged tractor type sub arc seam welder with precision level sensor to maintain proper position relative to bottom dead center by communication with the tank turning roll.

Tank Car Seam Welder Features:

- Welded aluminum frame
- Removable wire feeder, sub arc hopper and wire reel for decreased weight during installation into the tank car.
- On board flux hopper with gate valve.
- Phenolic dual drive wheels with drive disengagement.
- Lincoln wire feeder and sub arc nozzle.
- Four 5460 Lx white LED lights.
- External control with turning roll interface
 - PLC version available – Fixed program limits operator adjustment
 - Standard relay logic external control
- On board control
 - Limited function for PLC version
 - Full function with potentiometer adjustment



External Control PLC Version



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WARNING

The equipment herein has been designed for hardfacing or metal buildup. Mavrix highly recommends that the end user of this equipment review OSHA 29 CFR 1910.1026 and ensure that they are in compliance with this standard when operating this equipment. The end user must specifically implement available engineering controls to comply with the permissible exposure limits set forth by this standard. A brief summary of the standard follows...



OSHA STANDARD FOR HEXAVALENT CHROMIUM

On February 28, 2006, OSHA promulgated a revised hexavalent chromium standard for general industry ("the Standard") that includes a permissible exposure limit ("PEL") for hexavalent chromium of 5 micrograms per cubic meter (" $\mu\text{g}/\text{m}^3$ ") measured as an 8-hour time-weighted average ("TWA"), and a deadline of May 31, 2010, for employers to come into compliance with this PEL through the implementation of engineering controls. The deadline for compliance with the remaining provisions of the Standard, including those requiring the use of respiratory protection to comply with the PEL, is November 27, 2006, for employers with twenty (20) or more employees, and May 30, 2007, for employers with nineteen (19) or fewer employees. 29 CFR 1910.1026, 71 FR 10100 (Feb. 28, 2006);



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