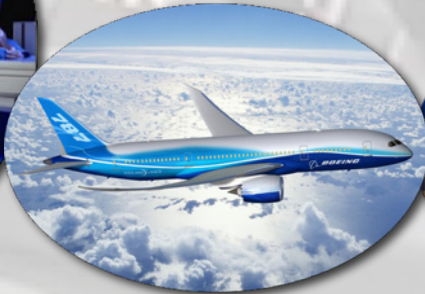
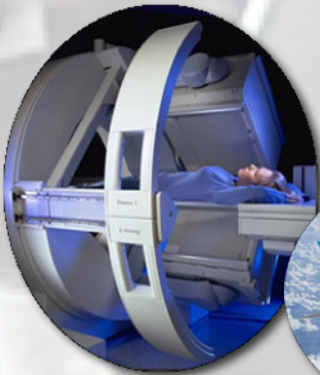




Advanced Automated Welding Systems

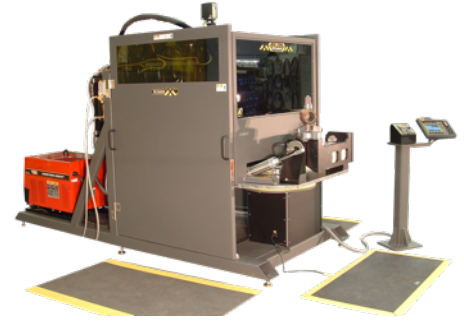
Welding critical components around the world



30 YEARS OF WELDING AUTOMATION EXCELLENCE



AMET® is an international company with over 30 years of experience developing, producing, and supporting automated welding systems. Our proven systems have been a part of manufacturing critical components for many industries throughout the world. Our focus has been to provide completely integrated welding systems, combining precision controls, process equipment, and weld fixtures, all programmed and controlled via a single controller. To achieve our desired level of integration with all the necessary process equipment, AMET® designs and produces its own control hardware and software. We introduced the use of DSP, Digital Signal Processor, technology to welding controls and continue utilize the latest controls technology to provide our customers with advanced, fully integrated solutions to achieve their welding requirements and project demands.



Many companies in the world produce and manufacture weld fixtures and then add basic controls to produce a system. The quality, precision, and user interaction of these “integrator produced” systems vary greatly from integrator to integrator. These, PLC based systems, are typically sequencers and still require a significant amount of operator assistance and input to reliably meet the customer’s quality and performance needs.



In contrast, AMET® provides its configured system control packages as a “foundation” to achieve the project requirements, and then ensures the fixturing and process equipment will provide the necessary precision, reliability, and robustness. AMET’s modular control is designed to provide superior control of the entire process, be easily programmed, monitor and record the process, and be easily maintained.

AMET’s “single controller” design provides the customer with process repeatability, minimizes operator setup time, reduces operator control errors, simplifies programming, and provides reliable process verification with it’s built-in data acquisition.

Our system control packages are the culmination of over 30 years of design, production, and support experience. The philosophy is to essentially dedicate a processor to each component of the welding system. The multiple processors then communicate over a network with the single controller to accurately and effectively control the process. This method also allows for additional motion or sensor requirements to be added to the system by simply “plugging in” more control modules, with the required equipment or sensors, to the “network”, thus expanding the capability of the system.



AMET’s control packages use DSP technology to control each welding parameter in the process. Precise and accurate weld control and monitoring requires fast and accurate signal processing. DSP’s are specifically designed for this requirement. The world continues to become more digital, and DSP’s are leading this digital transformation. They are found in mobile phones, digital cameras, a host of other consumer products on the market, and now in the most advanced automated welding systems.

Precise controls require precise fixtures to accurately control torch and part positions. To ensure the controls and fixturing are appropriately matched, AMET® manufactures its own line of weld fixtures. We use high quality components to ensure precise motion with minimal backlash. Encoder based servo control is used on all motion devices for proven accurate position and velocity control. We also stress relieve the structural components prior to machining on most of our fixtures, to ensure they provide precision performance throughout their life.

It is AMET’s objective to provide the best automated welding systems, as well as the best after-sales support in the industry. We have produced over 600 advanced welding systems to assist our valued customers in producing their critical products. In 2012, AMET® was recognized by the American Welding Society for it’s contribution to the welding industry receiving it’s Image of Welding Award.



30 YEARS OF WELDING AUTOMATION EXCELLENCE



Based on our in-house design and manufacturing capabilities, AMET® is in a unique position to offer our customers several approaches to meet their specific project requirements. We can provide complete engineered solutions, control only solutions, or weld fixtures only.

ENGINEERED SYSTEMS



Engineered systems require experienced engineering. Automated welding systems have unique challenges related to the process. High frequency electrical noise, high component temperatures, thermal cycling,

non-pristine environments, and others are important factors that must be addressed and accommodated as major factors of a successfully engineered automated welding system. From its inception, AMET® has maintained a solid core of mechanical, electrical, and software engineers, that have been dedicated to designing and producing systems for this difficult environment. From circuit board, to weld head design, and manufacturing, AMET® has proven capabilities to provide the right solution.

ADVANCED DIGITAL COMPONENTS

Whether for an upgrade, retrofit, or complete engineered solution, AMET® offers our own advanced digital components to meet your specific project requirements. The advanced system capabilities that AMET® is able to provide includes: Arc Voltage Control, Wire Feed, Magnetic Arc Oscillation, Mechanical Oscillation, Seam Tracking, Motorized Wire Nozzle Positioning and precise Travel Control. AMET® also offers precision Variable Polarity and Hot Wire power supplies.



ADVANCED "DSP" CONTROLS

All AMET® systems utilize Digital Signal Processor control technology. This is the technology that allows AMET® to provide its networked, multiple processor based systems. This architecture combined with user-friendly graphical interfaces, and precision weld fixtures, provide superior, consistent and reliable, welding performance. Because of this ability to easily add processors (modules) dedicated to specific tasks for the process, the capability of our proven XM® & XPro control systems is continually expanding as we develop or incorporate new equipment to better control or monitor the welding process.



PRECISION WELD FIXTURES

AMET® also produces its own complete line of precision weld fixtures to the welding industry. This product line consists of linear seam welders, weld lathes, manipulators, gantries, positioners, turn tables, turning rolls, weld chambers, roll planishers, tracks & carriages, and custom designed equipment.



30 YEARS OF WELDING AUTOMATION EXCELLENCE



ADVANCED SYSTEM CONTROLS

XM[®] Weld Process Controller

The XM[®] is AMET's most proven Weld Process Controller. The networked architecture of the XM[®] Controller and the XM[®] control modules has been the foundation for 100s of completely integrated welding systems for over a decade. The versatility of the XM's modular architecture, combined with the CAN Bus communication protocol, allows AMET[®] to provide some of the most robust and reliable welding automation solutions on the market.

The XM[®] features a user-friendly HMI (Human Machine Interface) for weld program creation, storage, and execution. Programming is performed using a combination of "select and dial" inputs and a graphical display. Simply select a parameter and dial in the desired value. The end result is an easy-to-program controller that does not require knowledge of any special machining languages.



Advantages

-  Single control interface. AMET[®] integrates the XM[®] Controller with the motion axes, wire feeder, welding power supply, mechanical and magnetic oscillators, mass flow controllers, safety equipment, laser seam tracking, etc. using XM[®] control modules and a CAN Bus network. This allows them all to be programmed from a single interface point for a turnkey automated welding solution.
-  High-precision motion control. AMET[®] uses servo motors with encoder feedback on all programmable motion axes for repeatable and consistent performance.
-  Long-term support. AMET[®] has developed and maintained both the software and hardware for the XM[®] using an embedded Linux operating system. The open-source nature of Linux allows AMET[®] to have complete control over future OS revisions. This combination of using a Linux embedded OS with AMET[®] produced hardware and software virtually eliminates the risk of system obsolescence.
-  Tactile feedback. The XM[®] Controller incorporates physical joysticks, knobs, and buttons allowing the operator to make control adjustments while still viewing the weld. This is much more difficult for an operator to sense that a change has been performed on a touchscreen interface where there is no tactile feedback.
-  Manual overrides. The operator can make adjustments to welding parameters and the motion axes during welding operations, accounting for variations in the materials, fit-up, or weld joints. A supervisor or welding engineer can set override limits that prevent the operator from altering or overriding the parameters beyond a defined range, if desired.
-  Retrofit capable. The XM[®] can be integrated with existing fixtures such as lathes, seam welders, and manipulators to extend equipment service life and expand capabilities. The retrofits can even be performed on suitable equipment that was not produced by AMET[®], which can help reduce costs by reusing positioning equipment.
-  Communication. The XM[®] Controller and XM[®] modules communicate via CAN Bus which is more robust and reliable than Ethernet. CAN Bus is used in critical applications and harsh environments, which is why it has been a required communication protocol in the US automotive industry.



30 YEARS OF WELDING AUTOMATION EXCELLENCE



XPro Series of Weld Controls

XPro • XPro-Mobile • XPro-Portable

The XPro Series of Weld Controls expands upon the same basic architecture as our proven XM[®] Controller with precision control modules integrating the welding power supply and welding axes for a complete turnkey solution. However, the XPro Series has an increased capacity for tackling even the most demanding welding needs. It utilizes the same Digital Signal Processor (DSP) technology found in the XM[®], but adds an enhanced HMI (human machine interface) with a large touch screen and keyboard to make weld program creation and menu navigation even easier. The advanced hardware combined with the user-friendly interface results in a capable yet easy to program welding solution. Once created, weld programs can be initiated directly from the touch screen interface or the handheld remote pendant that features tactile feedback like the XM[®] control pendant.



The XPro is the standard configuration.



The XPro-Mobile is designed to be used with multiple welding fixtures.



The XPro-Portable is designed for field use.

Advantages

- Single controller:** A single controller integrates with the motion axes, wire feeders, and the welding power supply providing a central control point for all welding and motion parameters.
- Touch Screen Interface:** The human machine interface features a large touch screen display on an operator console with a keyboard providing for easy navigation and weld program creation.
- Advanced Programming:** The XPro Series offers advanced programming functionality allowing even the most challenging of applications to be completed with ease.
- Expandable:** The XPro Series features modules that allow increased system capabilities by simply plugging in a new module. When a new module is introduced, it is automatically recognized and integrated.
- Long-term Support:** The XPro Series utilizes an Embedded Linux operating system ensuring that AMET[®] will be able to provide long-term support and stability. AMET[®] writes the XPro software and manufactures the hardware, including the control boards, ensuring no risk of obsolescence due to third-party changes.
- Retrofit Capable:** The XPro Series can be integrated with existing fixtures such as lathes, seam welders, and manipulators to extend equipment service life. Retrofits can even be performed on equipment that was not produced by AMET[®], which helps reduce costs by reusing large positioning equipment.



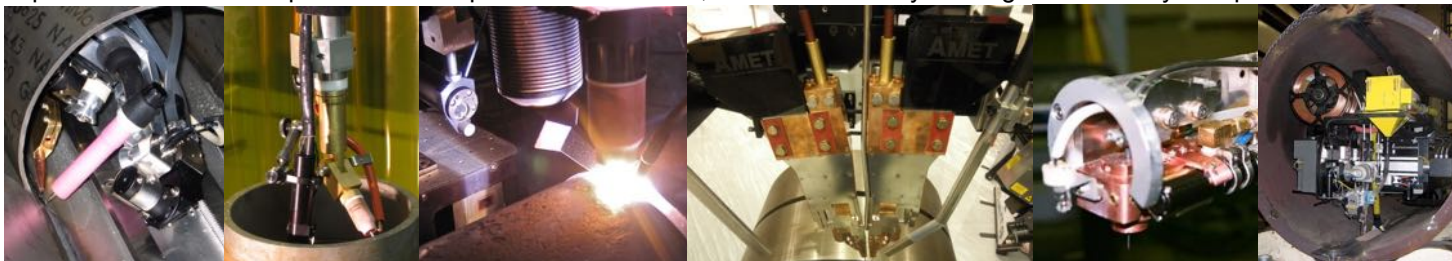
30 YEARS OF WELDING AUTOMATION EXCELLENCE



AMET® WELDHEAD AND POWER SUPPLY SOLUTIONS

SPECIALIZED PROCESS WELD HEADS

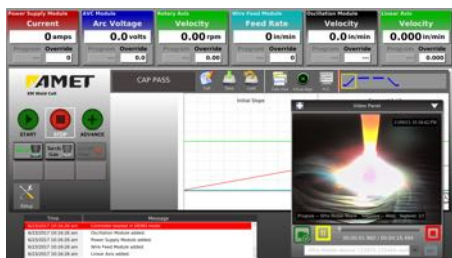
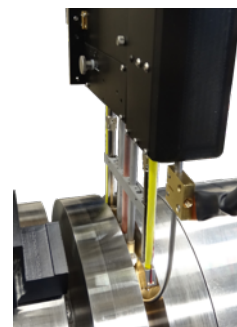
Over the past several years, AMET® has developed specialized torches and complete weld heads to meet the specific custom needs of our customers and their requirements. We are able to provide solutions for many special applications, including narrow groove hot/cold wire GTAW, reduced groove tandem SAW, narrow groove tandem SAW, hot/cold wire bore cladding, small bore GMAW, and multiple wire SAW (both ID and OD). AMET's unique engineering capability and experience allows us to provide these specialized solutions, and we are always willing to consider your special need.



NARROW GROOVE SOLUTIONS

AMET's narrow groove GTAW weld head is suitable for applications with a minimum groove width of 9/16" (14mm) and a standard groove depth of 8" (203mm) with other depths optionally available. The weldhead is offered as either hotwire or coldwire with motorized 2 axis wire positioning. The oscillation capability features a variable wire to tungsten ratio and variable oscillation amplitude and dwell. Our dual cameras specifically designed for Narrow Groove GTA welding provide both a leading and trailing view of the weld puddle.

The narrow groove SAW weld head is designed for single or tandem wire operation in joints up to 350mm deep and with 9.0mm minimum root radius. The head includes manual roll, pitch and yaw adjustment. AMET® provides independent servo-controlled adjustment of the wires under program control with override capability.



VIDEO SOLUTIONS

AMET's Arc viewing camera solutions are offered to facilitate the initial positioning of the weld head and for remotely monitoring the weld process. With the XPro control platform, the video feed is integrated into the touchscreen interface as shown in the image to the left. Many different camera form-factors are available to suit a variety of different torch arrangements and workspace requirements.



VARIABLE POLARITY POWER SUPPLY

AMET® produces its own precision Variable Polarity welding power supply, the VPC-450. This 450-amp power supply is able to perform TRUE Variable Polarity welding. VP switching can be programmed as low as 0.5 milliseconds. This supply is being utilized for critical aluminum, copper, and titanium applications.



HOT WIRE FEED POWER SUPPLY

AMET® also provides a precision "high-voltage" hot wire feed power supply. This supply generates a true sine wave output to preheat filler wire for GTAW and PAW welding applications. The desired goal is to increase deposition rates over traditional cold wire feeding by preheating the wire before it enters the weld puddle. This power supply is rated at 20 volts, 200 amps at 100% duty cycle, with frequency adjustment. The supply is also designed to measure voltage at the wire guide tip for more precise control.



HIGH FREQUENCY ARC STARTER

In response to industry needs for a powerful arc starter, AMET® developed its own HF (high frequency) starter. The arc starter is offered with a 300 and 500 amp capacity. These HF units are designed to work with AMET® controls and systems. They are relatively small in size, and thus we are able to locate them close to the weld head to minimize HF noise on the system and provide better starting capability.



30 YEARS OF WELDING AUTOMATION EXCELLENCE



PRECISION WELD FIXTURES

AMET® prides itself in designing and creating high quality weld fixtures for industrial applications that compliment our control capabilities. Our weld fixtures are typically offered in two classifications, standard and precision. Standard models provide adequate precision for most welding applications. However, our precision line of fixtures is true robotic grade quality and is used on those demanding automation applications where near zero tolerance and repeatability is required.



PRECISION BENCHTOP LATHES

These lathes are designed and built for a high level of accuracy, versatility, and repeatability. They can be used for a wide range of applications with high or low production runs. With a small footprint, multiple lathes can be placed within a weld cell to optimize space and production of parts up to 18 in. (457 mm) in length, 16 in. (406mm) OD, and maximum weight up to 250 lbs (113 kg).



HEAVY-DUTY BENCH LATHES

Like the Precision Benchtop Lathes, the Heavy-Duty Bench Lathes are designed and built for a high level of accuracy, versatility, and repeatability. These lathes simply have increased weight and part length capacities, up to 750 lb. (340 kg) weight and 60 in. (1524 mm) in length, without sacrificing any of the precision motion.



INDUSTRIAL WELD LATHES

Industrial weld lathe systems are used to produce high quality welds with minimum distortion on circumferential (girth) weld joints for a wide variety of parts and part shapes. These lathes can accommodate parts from 1100 lbs (500kg) to 22,000 lbs (10,000kg) with lengths from 23 inches (600mm) to 236 inches (6,000 mm). Single and multi-pass welding can be performed using GTAW, PAW, VPGTAW, VPPAW, GMAW, FCAW, or SAW welding. The weld lathe can be optionally fitted with two or more weld heads so multiple welds can be performed simultaneously.



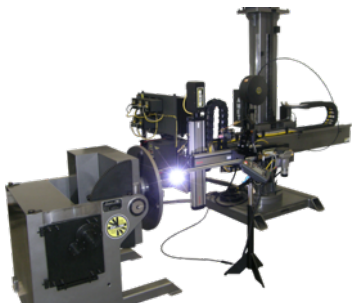
COLUMN & BOOM MANIPULATOR SYSTEMS

AMET® has developed a product line of column and boom manipulators, which is unmatched in the industry. We offer four models (ultra-light, light, standard, and heavy duty) based on weight capacity. We can build to suit your stroke requirements, but our standard range spans from 1 x 1 meter to 7 x 7 meter (39"x39" to 275"x275"), based on the model and weight. We also design and produce ultra-precision manipulators where each axis of motion can be used for precision, robotic grade motion.



Our manipulators are specifically designed for rigidity and precise motion. High strength materials and precision rails are used on both axes to provide a rigid and proven system for years of reliable operation. Additional options are available to customize your Column & Boom to meet your exact requirements.

AMET's Column and Boom Manipulator systems offer versatility for a wide range of applications from hotwire GTAW bore cladding to SAW.



30 YEARS OF WELDING AUTOMATION EXCELLENCE

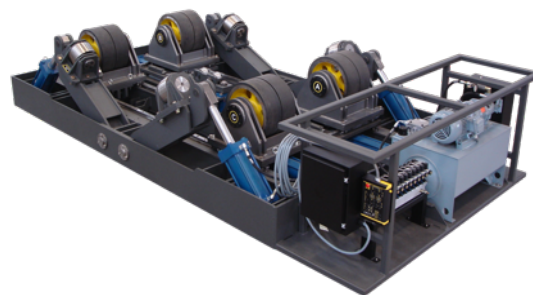
LINEAR SEAM WELDERS

AMET's Seam Welders are designed as a complete system for performing external linear welds. Typically these parts are cylindrical, but other shapes can be accommodated. Each is equipped with our world-class controls and servo motor driven motion axes for precise control and consistent performance. These seam welders, as with all our systems, are designed to provide ease of use, quality, robustness, high-precision, and repeatability. Many weld processes, such as GTAW, PAW, GMAW, FCAW, and even multi process weld heads can be integrated into our seam welders.



TURNING ROLLS & FIT-UP ROLLS

AMET® provides a full range of standard and self-aligning turning rolls. Weight capacities range from 5 ton to 120 ton as standard. Our turning rolls use synchronized motors to drive each driven roller to reduce the time required when changing from one diameter to another. Again, we offer a standard version and a precision version (servo driven series) based on the demands of the project. Due to AMET's involvement in the wind tower industry, we have also developed a line of true fit-up rollers, currently offered in

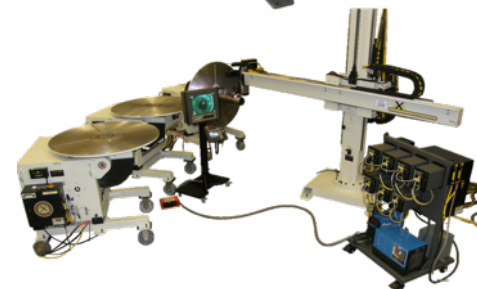


20, 40 and 60 ton capacities. Again, AMET's engineering capabilities provide the ability to expand and specifically address more project requirements than most automated welding companies.

POSITIONERS

AMET® manufactures a wide range of positioners with weight capacities from 550 to 22,000 lb (250 to 10000 kg). They feature 135 degrees of motorized tilting and continuous motorized rotation. The rotation axis can be integrated with the XM® or XPro control systems to provide programmable control for welding operations. High-precision models are also available with harmonic drive rotation for the most stringent needs.

The standard configurations include a fixed base, but can be upgraded to have adjustable centerline height using an elevating base with manual or motorized adjustment. Each positioner includes a thru-hole for a gas purge device. Many additional options are available to customize a positioner according to specific project requirements.



TURN TABLES

As part of our bore cladding systems, AMET® has developed a line of motorized turntables. These turntables can range in weight capacities from 250 kg to 60,000 kg (550 to 132,00 lbs), as standard. We can quote larger capacity tables on a case-by-case basis. The rotation axis can be integrated with the XM® or XPro control systems to provide programmable control for welding operations. Turntables are offered in standard and precision models.





TRACKS AND CARRIAGES

As a spin-off to the seamers and weld lathes, AMET® has also developed a full line of tracks and carriages. Our bench tracks are ball screw driven and sealed. We offer a flat-way track, standard, precision, heavy duty and extra heavy-duty tracks. These allow AMET® to handle most projects. If necessary, AMET® can provide a specialized track system to meet your needs. The heavy duty and extra heavy-duty tracks are designed to carry cantilevered booms to allow the weld head to be placed a significant distance from the carriage if necessary. Cantilevered booms can also be fitted with travel carriages.



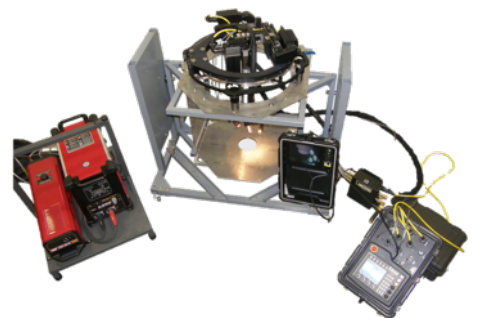
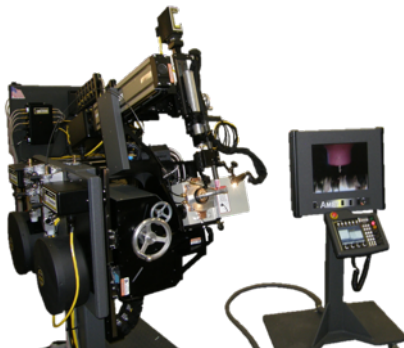
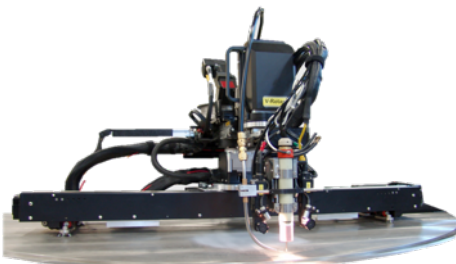
CHAMBER SOLUTIONS

AMET® has extensive experience designing and producing chamber and glove box welding systems. These chambers include high temperature applications where shielding is critical, radioactive applications where electrical component integrity is vital, high quality weld emphasis applications where only 5ppm of oxygen are allowed, and high volume production welds with integrated part loading and unloading fixtures. Our engineers design each chamber welding system with ease-of-use, accessibility, and a compact footprint in mind, ensuring that all necessary components for operation and maintenance can be comfortably accessed and manipulated through glove ports. The AMET® XM® and XPro Controllers, coupled with our arc viewing cameras, allow the ability to control the welding system remotely.



CUSTOM FIXTURES

AMET® specializes in building custom automated welding systems to meet our customers' specifications. Our advanced controls allow us the flexibility to adapt for a wide range of applications from high precision GTAW welding for aviation industry engine components to heavy-duty SAW welding of wind towers. We are able to incorporate multiple weld processes, safety equipment, real-time tolerance checking, and sensors to constantly monitor aspects of the weld puddle such as oxygen and humidity levels. These capabilities can be integrated with our full line of weld fixtures or a custom weld fixture can be built.





ENGINEERED SYSTEM SOLUTIONS

AMET® has an established history of providing custom engineered “turn-key” systems, including CNC motion controlled systems. Our experienced engineers are able to provide you with state-of-the-art solutions. This capability is unique in today’s market and business climate, and one which we are very proud to offer to our customers. We have provided systems to many different industries, and a sample of systems supplied into specific industries is shown below.

POWER TURBINE



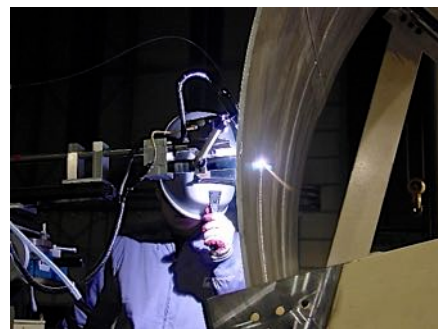
Welded components used in the power generation industry are usually for high-pressure applications. The welds require consistency and integrity to ensure each component is able to withstand these environments. We provide precision automated welding solutions for the manufacturing of boiler components and pressure gauges. Our XM® and XPro based systems provide our customers with the necessary control and data acquisition required by this industry.



AEROSPACE/AVIATION



AMET® has designed and manufactured turn-key welding solutions for aerospace companies since 1992. Our advanced systems are used to make components used on commercial and military aircraft, as well as the craft and equipment going into space. Extreme precision, accurate data acquisition, and consistent repeatability are necessary in the aerospace and aviation industries. Our systems provide the necessary precision and advanced control required by these critical applications.



OIL & GAS



Usually performed in rugged industrial environments, with high strength, and high quality weld requirements, welding applications for the Oil & Gas Industry can be challenging. AMET® manufactures complete systems with GMAW, SAW, Hot-Wire GTAW, or a combination of these processes for pipe welding, valve and flange joining, vessel manufacturing, cladding and hardsurfacing, and thick wall welding applications.

We specialize in advanced controls to provide the necessary capabilities from pipe welding to complex bore cladding operations. With numerous proven systems currently producing parts in many areas of the Oil & Gas Industry, we have the ability and experience to meet your project needs.



FOOD & BEVERAGE



AMET® provides systems to the food and beverage industry for making stainless steel vessels and containers. We build GTAW, PAW and “Dual Arc” systems to our customer base. The XM® and XPro are ideally suited for controlling one or multiple power sources for Dual Arc welding (Plasma + TIG) and precise velocity and positioning control of the motion axes.



30 YEARS OF WELDING AUTOMATION EXCELLENCE

NUCLEAR



With an emphasis on precision tooling and controls, we produce some of the most adept systems for the Nuclear industry. AMET® provides welding systems for critical applications in the nuclear industry. We deliver systems for nuclear containment vessels, component repair, and for power generation applications. Some of these systems are located in "hot" areas, so they are "hardened" for exposure. They also include remote operation functionalities, which give the operator control over the system from a safe environment.



DEFENSE



AMET® produces several automated systems for the Defense Industry. This industry has a wide range of applications, which often require high-precision motion to ensure the integrity of each part is maintained. Our systems include solutions for naval shipyards, national laboratories, and defense contractors. The systems we provide for this industry range from standard setups such as manipulators and lathe welders to completely custom solutions.



TRANSPORTATION



We provide automated solutions for the transportation industry. This industry requires high quality welds and consistent performance to maintain the integrity of each part produced. We build completely integrated seam welding systems for the manufacturing of products used for hauling chemicals, acid, waste, and food products. Our solutions are capable of being integrated with other components at the customer's facility such as feed tables.

WIND POWER



Welding in the wind tower industry can be a daunting task. Extremely heavy-duty equipment is required to manipulate and fabricate the wind towers that support the turbines. AMET® manufactures complete SAW (Submerged Arc Welding) systems for the circumferential and longitudinal welding of each can. We specialize in single, tandem, or multiple wire weld heads with the ability to integrate multiple power supplies. We also offer complete growing lines with fit up stations and turning rolls.



PIPE MILL



AMET® has installed many XM® based control packages on LSAW and Spiral pipe mills. With our Digital interface technology, we are able to couple the power of advanced digital SAW power supply technology with advanced seam tracking capability into one control package, capable of multiple arc welding with adaptive fill.





Our 35,000 square foot Manufacturing/Development facility along with our 70 Engineering, Technical, and Administrative personnel bring many leading edge capabilities in-house including:

-  Large Systems assembly with 20 ton crane
-  3D Printing Capability for custom components & prototypes
-  CNC machine shop capabilities
-  GTA / GMA / Plasma / Sub arc development and pilot production Systems
-  Multi-layer circuit board design / automated circuit board and electronics manufacturing

Controller Manufacturing: All controller components, including circuit boards, are developed and produced specifically for welding applications at our Rexburg, Idaho facility. AMET's in-house production ensures consistent quality and provides long-term availability and support.



AMET® is an international company. Our proven systems have been a part of manufacturing critical components for many industries throughout the world. To support our customers globally, we have Sales & Support Capabilities in both Europe and Asia.

***IF YOU HAVE SERIOUS PROCESS CONTROL AND MONITORING REQUIREMENTS FOR YOUR WELDING APPLICATIONS,
WE ARE SERIOUS ABOUT PROVIDING THE EQUIPMENT AND EXPERTISE TO ACHIEVE THEM!***

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30 YEARS OF WELDING AUTOMATION EXCELLENCE