

Linear Seam Welders



Product Line Overview

Linear Seam Welder – Standard

The following product line overview introduces the AMET standard model of linear seam welders. These seam welders are designed to compliment our XMS and SX controls. Based on the application, our LSW line of products can also be used with our XM system controls. The LSW is produced in a full range of weld lengths and in several different models in order to meet your application requirements. AMET will also consider your special requests for seam welders and features as well.

Purpose:

Linear seam welders are used to produce high quality welds with low distortion on linear weld joints on a wide variety of parts and part shapes. In most cases, the weld joint will have a butt-joint configuration. Welding is performed from the external (top) side of weld joint or on the internal (back) side of the weld joint depending on the model you select. In most applications, welding is performed in one pass, with 100% penetration. However, you can perform multi-pass welds if necessary. Welding is performed using GTAW, PAW, GMAW, FCAW, SAW or Laser. The joint is firmly clamped into position and the weld head is precisely moved along the length of the weld joint.

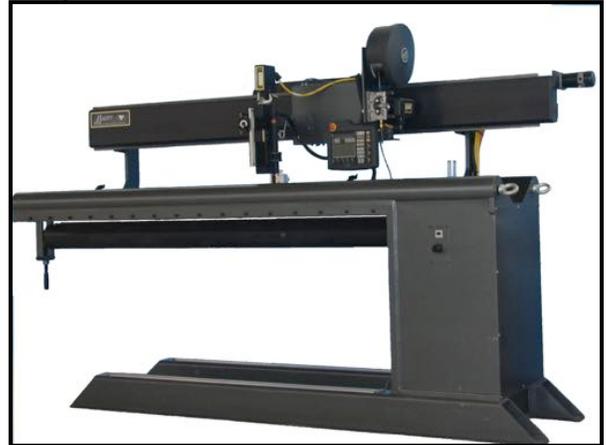
Benefits:

The AMET linear seam welder has several benefits over welding the part manually or by using just a motorized carriage or “buggy” approach, including:

- Able to achieve consistent, 100% penetration welds with even weld bead, both top and bottom
- Able to maintain part dimensional accuracy due to reduced distortion and weld shrinkage
- Eliminates or reduces tack welding and weld quality issues related to tack welds
- Provides ability to hold edges of weld joint firmly in place over entire length of part
- The chill-shunt effect reduces distortion, warping, and oxidation of the weld and surrounding area, resulting in better part appearance
- Increased weld (arc-on) time
- Reduced operator fatigue and involvement
- Reduced consumable costs

These benefits greatly reduce the time to prepare a part for welding and the time to finish a part after welding. Also, rework time and part scrap will be reduced

AMET can include optional features, such as part carts, pneumatic centering devices, and special mandrels, to increase the productivity of the standard seam welder by reducing the time to load and unload parts.



LSW-P-1500 Seam Welder

Capacities:

AMET can produce seam welders with a weld length capacity from 600 to 7200 mm (24” to 283”), based on the type of seam welder.

All standard seam welders have the following general capacities and specifications:

- Wall Thickness: 0.5 to 10.0 mm (.020 to .375”) Heavy-Duty can handle up to 16 mm (5/8”)
- Travel (Machining) Accuracy: +/- 0.4 mm per 3 meters (.015” per 10 feet) in unclamped condition
- Pneumatic clamping generates up to 72 kg/cm (4800 lb/ft) clamping force. Heavy-duty generates up to 9,000 lb/ft
- Carriage Drive: Precision Gear Rack and pinion gear
- Note – Diameter capacity depends on model and length of seam welder you select



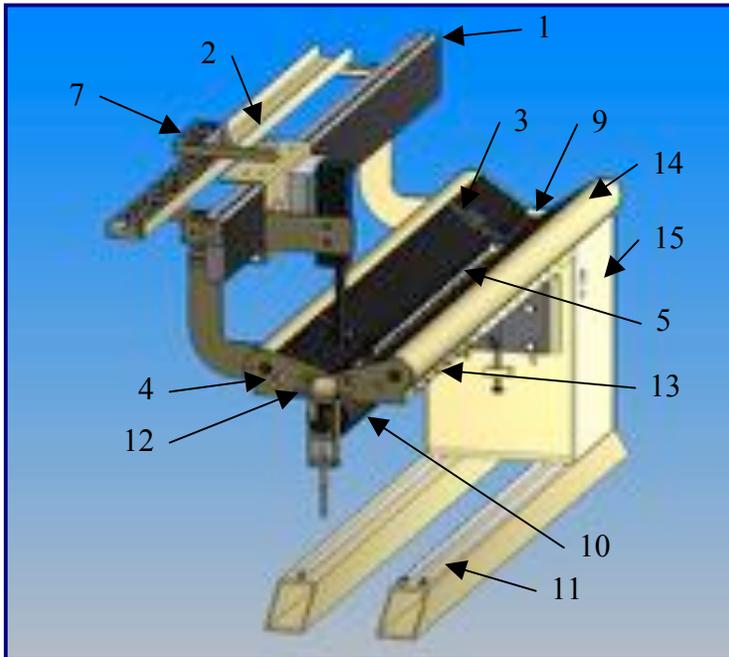
LSW-1200 with PAW capability

Linear Seam Welders

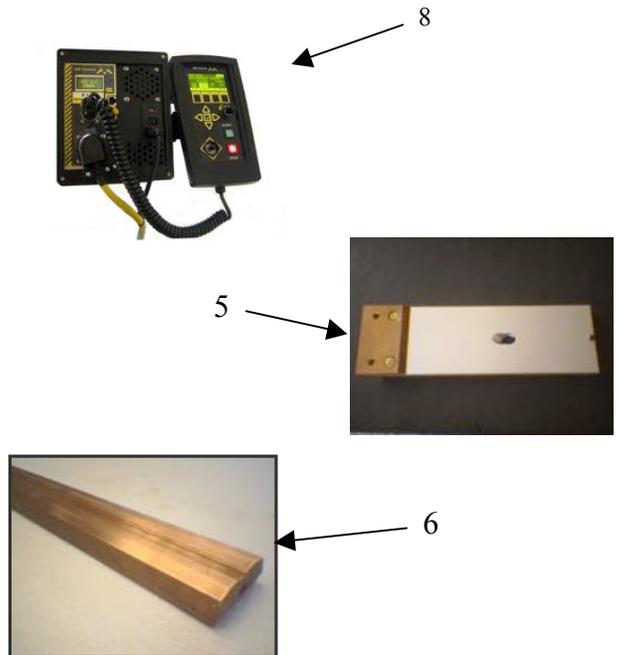


Product Line Overview

STANDARD FEATURES on Linear Seam Welders



1. Machined track, which is stress relieved and fitted with linear rails (THK style rails) and limit switch cams.
2. Motorized travel carriage using 4 carriers to ride on THK style rails, with rack and pinion gear drive. Includes limit switches.
3. Includes two manually operated, part centering alignment devices. Pneumatic versions are optionally available.
4. Pneumatic clamping hoses provide uniform clamping pressure along length of weld. Pressure regulator included to control clamping pressure.
5. Clamping fingers made from aluminum with reversible/replaceable copper fingertips to provide excellent heat conduction path and chilling of the weld zone during welding. Front bank of fingers also push forward during clamping to help maintain a tight butt joint
6. Includes standard copper back-up insert to further pull heat from weld zone during welding. Groove in insert is machined to match with material thickness and type. (Optionally available with gas purge.)
7. Includes flexible cable carrier and track support for proper cable management
8. XMS-Linear carriage control included as standard. The XMS control is based on DSP technology and able to sequence the weld and control the welding speed. The control includes closed-loop feedback on travel speed. Speed holding accuracy is +/- 1%



9. Operator Storage area, ideal for tools and torch parts.
10. Water-cooled support mandrel is adjustable in height to handle various material thicknesses. Special shaped and sized mandrels are available for special applications.
11. Foot touch tape switch control to activate clamping. Can change for hand pendent or foot pedals at no extra charge.
12. Safety Interlocks – cannot activate clamping if latch is not engaged, and you cannot unclamp part during welding
13. Finger to Finger distance adjustment capability. 3 to 30 mm (1/8 to 1 1/4") of adjustment. Also available from 10 to 44 mm (.39" to 1.73"), typically used on GMAW/SAW
14. AMET seam welders use thick wall tubing and steel construction to provide superior heat absorption and dissipation, and to minimize part deflection during clamping.
15. Separated control-mounting area in mainstay section for XM modules, so only the necessary controls and components are mounted on the carriage. XM is optional system control upgrade.

Linear Seam Welder



Product Line Overview

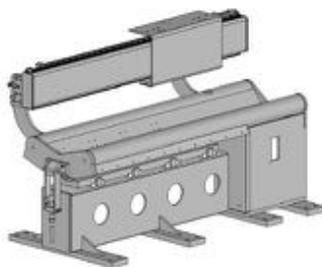
AMET Offers a Selection of LSW Models to meet your project requirements!

LSW - Standard "External" Seamer

The standard external seam welder is shown on Page 2. Designed to weld parts from the topside/external side of the weld joint. Typical parts include cylinders, conical shaped parts, rectangular tubing, and flat sheet

LSWI – Internal Seam Welder

The internal seam welder, as shown below, is designed to weld flat sheet and larger tanks and vessels from the inside, where the cylinder wraps around the track and tabletop assemblies. These seam welders are typically used on flat sheet conveyor lines and for making larger vessels, like storage tanks.



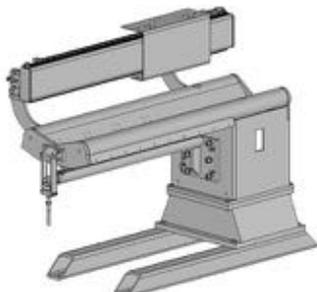
The table top construction is tilted inward (forming "V" shape) and the distance between the track to the table is reduced to provide the smallest envelop possible, which determines the

minimum part diameter. The base and mandrel become an integrated construction.

NOTE: This Model is available in our Heavy-Duty capacity

LSWC – Combination Seam Welder

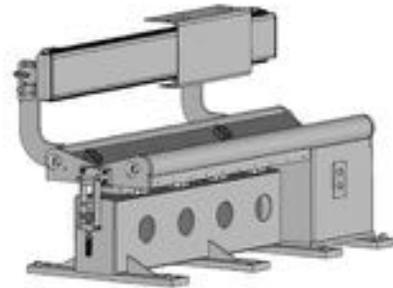
We take design features from the above two seam welder designs and make a seam welder able to perform both functions. The seam welder can weld smaller diameter parts "externally", and then weld parts "internally" after a specified diameter. The seamer can also weld flat sheet. When welding large diameter parts, with heavy wall thickness, the part must be supported partly.



We use a separate mandrel and base assembly, like on the standard seam welder. But we use the tabletop concept, like on the internal seam welder, which allows us to weld internally at a smaller diameter.

LSWFS – Flat Sheet Seam Welder

This seam welder is designed specifically for welding flat sheet, typically used in panel welding lines. We use a standard table top, which is more open and easier for the operator to observe the welding process. But we use the base of an LSWI, where the mandrel and base are integrated into one assembly.



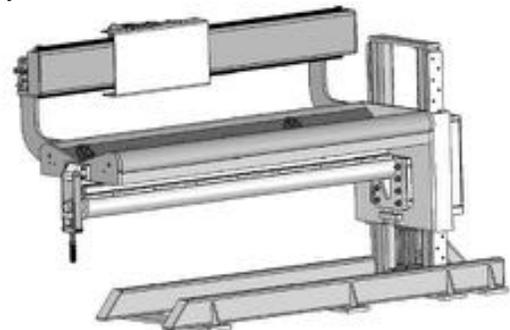
NOTE: This Model is available in our Heavy-Duty capacity

LSWE – Elevating Seam Welder

On this seam welder, we take track, table top and mandrel assemblies of a LSW and hydraulically raise it into the air. (Standard maximum part diameter is 8 ft/2.4 M) This feature allows the operator to handle a larger range of part diameters, and weld the parts from the external side of the weld joint.

The standard "vertical mainstay" section is replaced with a special support structure that is attached to a large hydraulic cylinder. The cylinder requires a pit beneath the seam welder.

This seam welder is ideal for the "job shop" which manufactures larger vessels, tubing and tanks. They can handle a large range of parts and produce a high quality weld.



NOTE: Please see the Technical Specification Data Sheet on each of these products for more details and information.

PRECISION UNITS:

Please note that AMET can also offer the customer the above seam welders in our "precision" version. The precision units include a ball screw driven carriage for precise movement with nominal backlash. (on weld lengths over 10 ft/3 meters, we use a servo grade precision gear rack) These units are especially designed to work with the XM line of controls, which are precise position based control packages.

Linear Seam Welder



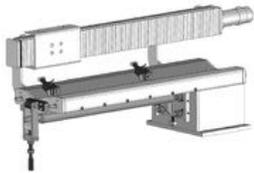
Product Line Overview

The precision units are as follows:

LSW-P	Precision Linear Seam Welder
LSW-PI	Precision Internal Seam Welder
LSW-PC	Precision Combination Seam Welder
LSW-PFS	Precision Flat Sheet Seam Welder
LSW-PE	Precision Elevating Seam Welder

Precision units are not offered in lengths exceeding 6 meters.

LSW-PB – Precision Bench Seam Welder



We can also offer the customer a small “bench” style seam



welder. These are especially designed for welding smaller parts, typically bellows and instrumentation. They are built using a smaller frame and track and carriage, so the maximum material capacity is reduced to 5/32” (4.0 mm). The seam welder is offered in a length range of 3” to 36” (75 to 900 mm). The seam welder base section is an optional feature on this design.

LSW-M – MIG/SAW/FCAW Seam Welder

Designed especially for the above weld processes, these seamers use the wider table top design, resulting in the wider adjustable finger distance. Also, the copper back-up insert is wider due to the larger back bead requirements. We also include spatter shield protection due to spatter and slag chip concerns. **Available in most models**

LSWA – Automatic Seam Welder

The LSW-A is our standard external seam welder, designed for high production applications. Automatically centers and clamps part after operator loads part. Once part is clamped, automatically performs weld. Includes cylinder to push part to front of mandrel after welding.

LSWV – Vertical Seam Welder

Seam welder set in the vertical position. Mainstay section modified accordingly. Includes stainless steel insert and fingertips. Used specifically for welding aluminum with the VPPA weld process.

NOTE: Please see the [Technical Specification Data Sheet](#) on each of these products for more details and information.

LSW LINEAR SEAM WELDER OPTIONAL FEATURES

Part Load/Unload Cart or Rails

This support device helps the operator to load and unload parts into the LSW. The cart or rails are adjustable for various diameters and uses rollers so the part can be adjusted in/out as well as turned CW and CCW. Includes v-way rails for the cart to ride along.

NOTE: Maximum Diameter is reduced when using this feature.



Pneumatic Centering Devices

The standard centering devices are manually moved in and out of position. These devices are air driven so they work semi-automatically. The operator toggles a switch to lower or raise these centering devices (1 pair)

Finger Tips

Standard fingertips are made of copper. In some applications, fingertips made from steel, stainless steel or chrome plated fingertips are required.



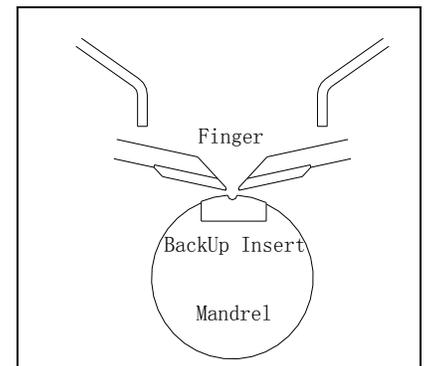
IGBI Inert Gas Back-up Insert

This copper insert is machined with a gas channel on the backside of it. Then a series of staggered holes, spaced 2” (50 mm) apart allow gas to pass to the backside of the weld joint to improve weld quality. This insert is required when welding reactive metals, like Titanium, and is recommended when welding stainless steel based materials.

Back-up Inserts

Inserts made from Steel, Stainless Steel, or Chrome plated inserts are available. These inserts are required when welding special materials where

copper is not allowed to contact the material when welding.



Continuous Clamping Strips

These copper strips are recommended when welding thin materials or materials where small amounts of oxygen are a concern.

Product Line Overview

LSW Seam Welder Optional Features (Con't)

Pivoting Mandrel

The mandrel is fitted with a hinge assembly at the vertical mainstay. A hydraulic cylinder is used to pivot the mandrel about this hinge, allowing the mandrel to open/close at the latch end. We design this assembly to allow at least 50 mm opening at the latch to ease part loading and unloading.

Used on models LSW, LSWC, and LSWE.

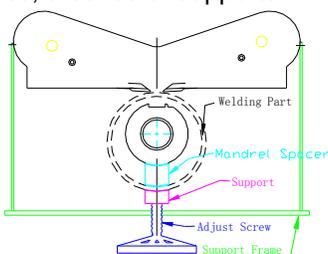


Retracting Mandrel (Insert)

The mandrel is "split" into two sections. The portion that holds the insert is secured through a series of levers to the remaining part of the mandrel. The levers act as a hinge assembly, allowing the insert section to lower up or down into position. This motion is achieved by a hydraulic cylinder located inside the vertical mainstay section. We design this assembly to allow at least 30 mm (1.25") between the fingers and the insert when in the retracted position, which simplifies the loading and unloading of parts. Can be used on all models, but typically on LSWI and LSWFS. (may add 4"/100mm to minimum part diameter)

Mandrel Center Support

In some applications, an undersized mandrel is required. However, when clamped, the mandrel will deflect beyond allowable tolerances. In these situations, we have to add a mandrel center support, or in some cases, a series of supports.



Stepped Mandrel

On some projects, the customer must have the ability to weld smaller diameter parts than allowed by the standard sized mandrel. However, they only need this smaller diameter capacity on parts that are less than permissible weld length. On some of these projects we can supply a stepped mandrel, where the latch end of the mandrel is machined with a small diameter. At some point the mandrel must increase in diameter significantly in order to counter the clamping forces. Typically includes special insert to match mandrel.

Air-Latch

The standard latch requires the operator to open and close it by hand. The air latch allows the operator to press one button to open the latch and press another button to close the latch. The latch is activated by a pneumatic cylinder assembly. A safety switch is included.



Manual Cross-Slides

AMET can supply single axis or dual axis cross slides to allow the operator to have manual cross seam adjustment and vertical stand-off adjustment for the weld head. Each standard slide has 100 mm of adjustment. The slides include necessary mounting hardware.

See Slide Literature for details.

Motorized Cross-Slide

AMET can supply a single axis motorized cross slide for cross-seam adjustment. Includes slide

assembly, variable speed control and a joystick pendant for positioning the slide position. AMET can offer the motorized slide with oscillation capability if desired.



See Slide Literature for details.

Air Slide

AMET can also include an air slide to lift and lower the welding torch away from the part. The slide is driven by a pneumatic cylinder with a 50, 100 or 150 mm (2, 4 or 6") stroke. We have two weight capacities, 15 and 45 kg (30 and 100 lb). The slide is automatically sequenced by the XMS, SX or XM system control.

See Slide Literature for details.

AVC (Arc Voltage Control)

An AVC module can be added to the system to automatically adjust for height variations due to mandrel deflection. Also, if running various parts, the arc voltage will likely need to be set differently to achieve desired weld quality. See AVC literature.

See AVC Literature for details.

AVS (Arc Video System)

Arc monitoring can be added to the seam welder to allow the operator to view the weld arc from a remote or convenient location.

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Product Line Overview

Typical LSW Seam Welder Applications

Air Cylinders

Air cylinders used in truck brakes, receiving tanks and air compressors.



Tanker Truck & Rail Trailers

Tanks associated with truck hauling and trailers.



Flat Sheet (panel welding)

Many applications require only sheet to sheet welding, such as welding panels for train cars and containers.



Hot Water Tanks

Hot water tanks heated by gas, electric and solar.



Aero-engine

Components used on jet engines (and other areas on aircraft)



Aerospace

Fuel cells, compartment sections and other critical components used in this industry.



Fuel Containers

Fuel storage containers, including truck tanks, LPG tanks, propane tanks.



Ducting for HVAC

New regulations in most countries require HVAC duct work to be welded.



Food Preparation

Filters, storage vessels, cooking vessels and other items used in the food industry have linear welds.



Petrol-Chemical Industry

Typical for stainless and special alloy vessels and pipe.



Conical shapes (Silos)

Many shapes are conical, not cylindrical. Silos are an example.



Beverage Industry

Stainless Steel and copper holding tanks.



Medical/Pharmaceutical

Cryogenic containers and autoclaves require excellent quality linear welds.

