



**WELDERS FOR
COLD-ROLLING PLANTS**
THE HIGHEST RELIABILITY
AND THE MOST SIMPLE TO USE

A KEY WELDER SUPPLIER OVER THE YEARS

PRODUCT MARKET TRENDS

With constantly evolving steel products and steel grades from low carbon to high strength alloyed and stainless steels, welder capabilities have to be continuously adapted to changing market requirements. This may include, for instance, fully automatic welding machines that run without operator assistance.

In addition, demand is rising for most reliable welds with ultra low break rate lines rate on their processing.

Last but not least, steel makers want to be prepared to produce new high-strength steel grades such as dual-phase, TRIP, 3rd generation steel.

HISTORY

- 1970: Primetals Technologies has been an active player in the iron and steel welding machines business
- 1995: building on our expertise, we created an ongoing global evolution program for all welder types. Mash lap and flash butt are covering all full thickness range. Since then, our welding machines have achieved all crucial success metrics higher performance, increased reliability, and better adaptability with innovations in steel (high-strength steel, etc.)
- 2000: development of the laser welding process with 2 laser welder types
 - A Medium gauge machine (LW21M) for annealing lines, galvanizing lines, inspection lines
 - A Heavy gauge machine (LW21H) for pickling lines and tandem cold mills
- 2010: solid state, laser source and laser cutting technologies are integrated to our welders

KEY ADVANTAGES OF PRIMETALS TECHNOLOGIES WELDERS

- Primetals Tehnologies can achieve full welding tests on a pilot machine to confirm the weldability and cycles of new products with a specific chemistry. The welds are then tested through a tailor made machine designed for specific weld quality requirements
- Complete workshop testing – our welders are all assembled, adjusted and tested in our workshop in Montbrison, France. Specific tests are then done according to customer product mix to lower the commissioning time
- Our machines integrate a high safety level concept allowing to work easily and safely
- Welders have been designed easy to use and to maintain thanks to our experience and by keeping a constant feedback from our customers. Substantial effort was made recently for a user friendly and accessible documentation. The Condition Monitoring System is an additional advantage reinforcing our machine follow up along the years



PRIMETALS TECHNOLOGIES WELDERS DRAW ON FOUR DECADES OF EXPERTISE

As a globally active full-liner, we provide you with expertise that is unique in the steel production industry. Backed by our extensive experience, our product solutions ensure that every aspect of your production process is optimized. Not only do we provide cutting-edge technology, we also offer top-notch service. In everything we do, our goal is to improve your plant's performance.



LASER WELDERS - TOP QUALITY WITH MINIMUM MAINTENANCE

Laser welders are the perfect answer to increased market demands for high-strength steels, greater product flexibility (from oxidized, pickled, and non coated to coated strip) and top-quality processing and weld geometry. The Laser cutting technology allows to cut with a perfect and constant quality a wide range of product from ductile steels to the highest strength.

Our laser welders at a glance:

		LW21M	LW21H
		Laser cutting	Laser cutting
Maximum tensile strength	MPa	No limitation	No limitation
Strip thickness	mm	0.2 to 3.5	0.7 to 8.0
Laser source power	kW	up to 6	16
Planishing force	kN	20	40

MASH LAP WELDERS - FOR EFFICIENT STRIP JOINING

Mash lap welding is well adapted to ranging from 0.1 to 3.5 mm. In 1995, we created a new generation of ML21 mash lap welders geared to precision and high-strength steel welding. The ML21L and ML21M set new benchmarks with full closed-loop control of the welding process. The ML21H welds strip gauges of up to 5 mm in thickness, typically for cold and hot band.

Our mash lap welders at a glance:

		ML21L	ML21M	ML21H
Maximum tensile strength	MPa		up to 800 MPa**	up to 800 MPa**
Strip thickness	mm	up to 1.5*	up to 3.5*	up to 5*
Welding force	kN	20	30	
Planishing force	kN	60	60	80
Current	kA	22 (AC)	46 (DC)	46 (DC)

* Depending on material grade ** With annealing treatment on high range of yield strength

LASER WELDER LW21M FOR GALVANIZING AND FINISHING LINES



Thyssen krupp Angang

LW21M

- Cutting Tail and Head end by Laser
- Welding by Laser
- Weld quality control online
- Filler wire (Option)
- Post heating
- Planishing (Option)
- Fume exhaust
- Class I Laser machine (full confining cabin)

ENTRY/EXIT EQUIPMENT

- Markless clamp system
- Contactless sensor
- Ultra fast notching

GOOD CUT, GOOD WELD

The laser cutting of the strip head and tail offers a straight & square face without vertical strip deformation so as to reach a perfect weld quality. This is achieved without any tool wearing and whatever the product characteristics contrary to past mechanical cutting process. Cutting and welding process are done on the same way so there is no issue generated by blade and weld axis misalignment.

BENEFITS OF THE SOLID STATE LASER SOURCE TECHNOLOGY

Solid state laser source technology provides significant benefits:

- Ultra low maintenance by using fibers to transmit laser beam instead of mirrors, open beam path...
- No adjustment beam
- Maintenance of the laser system is very basic and frequency is low (1 Year). Less wear parts in stock

HIGH LEVEL OF PERFORMANCE

With a higher efficiency level and a higher beam quality, the solid state technology allows to weld in higher speed range if the technology is well mastered and the setpoints defined intelligently.

ELIMINATION OF WELD SEAMS

Galvanizing, tinning and finishing lines as well as mash lap machines, although highly efficient, may generate burrs that can damage the surface of coil wraps during coiling. The laser welder solves this problem by producing flat welds, thereby leading to improved quality and yield.

WELDABILITY WITH COATED AND UNCOATED STEEL

With the mash lap process, coated steel sheets can quickly contaminate welding wheels (50 times more than on non coated steel) requiring their reconditioning which means production losses and higher maintenance costs. Laser welding cuts out this problem, as it requires no contact between the strip and the laser head.

LOWER MAINTENANCE & OPERATION COSTS

Because laser cutting requires no shear blades or welding wheels, it reduces the need for maintenance and thereby lowers your overall costs.

SAFETY

Class I Laser machine with a high protection against radiation without decreasing the operability.

LASER WELDER LW21H

FOR CONTINUOUS PICKLING LINES AND TANDEM MILLS



LW21H

- Cutting Tail and Head end by Laser
- Pre heating
- Welding by Laser
- Weld quality control online
- Filler wire (Option)
- Post heating
- Planishing (Option)
- Fume exhaust
- Class I Laser machine (full confining cabin)

ENTRY/EXIT EQUIPMENT

- High strip speed positioning
- Powerful notcher

Heavy-gauge laser welder LW21H

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ULTRA WIDE RANGE OF PRODUCT

The higher performance of Hot rolling mills to produce low thickness and the products generation with complex chemistry make the Flashbutt welders becoming out dated. The mechanical cut is also an issue for Laser butt welding process as the shearing quality is varying according to product characteristics. LW21H is therefore providing high advantages by combining Laser cutting and Laser welding technologies.

VERY LOW MAINTENANCE

- Zero blade change
- Ultra low maintenance by using fibers to transmit laser beam instead of mirrors, open beam path...
- No need to adjust the beam axis
- Maintenance of the laser system is very basic and frequency is low (1 Year)tLess wear parts in stock

SAFETY

Class I Laser machine with a high protection against radiation without decreasing the operability.

MASH LAP WELDERS

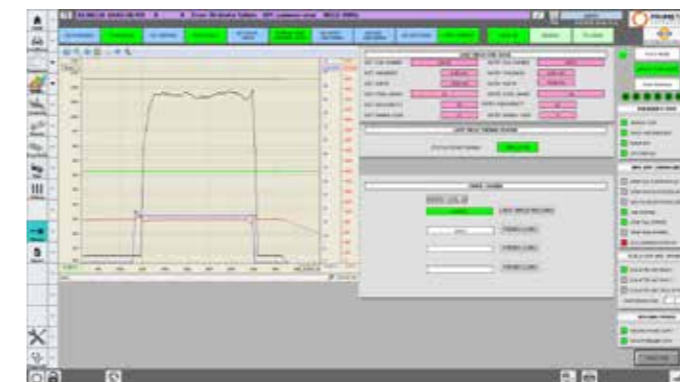
A CLEAR CONCEPT WITH CLEAR ADVANTAGES



Mash lap welder ML21M

Since 1995, we have successfully supplied machines worldwide with the following features:

- Single-cut shearing
 - Extra space for tail and head ends before cutting; strip stop accuracy of 0 to 200 mm
 - Identical cut shape of tail and head ends before cutting, increasing blade life by more than two years
 - Burr located inside the weld, increasing life of welding wheels
- Feedback control of welding current, ensuring consistent weld quality
- Separate feedback control for operator and drive sides, allowing for adjustment to thickness and steel grades, better weld quality



Thermo view

BUILT-IN RELIABILITY

Our mash lap welder family provides reliable, high-quality industrial welding solutions that include a variety of technological innovations:

- Digital feedback control of all welding parameters (including current)
- Automatic welding wheel reconditioning after each weld
- Weld quality control with IR thermometer temperature measurement
- Direct current (ML21H and M)
- Welding set-point model
- Post heating system for high-strength steel.

In addition, the optimized sequencing and high welding speed (15 m/min with up to 1.5 mm) of our mash lap welders allow for a short cycle time of less than 30 seconds.

FOR STAINLESS STEEL AS WELL

In collaboration with the Aperam group, we have proven the reliability of the mash lap ML21 on stainless steel (ferritic and austenitic) of up to 3 mm thickness. Our mash lap welder ML21 will meet your needs for high-quality stainless-steel welding.

EXCELLENCE FROM EXPERIENCE

SELECTED SUCCESS STORIES WITH WELDERS FOR COLD ROLLING PLANTS WITH CONDITION MONITORING



Heavy Laser Welder

Our solution. LW21H laser welder, preheating, post heating, filler wire, planishing

The result. High speed cutting and high welding quality

Welded product range. IF to QnP, Aisi 340, Aisi 430, Si steel, 3rd generation steel

Technical data. Width: 600 - 2150 mm; thickness: 0.50 - 8.0 mm



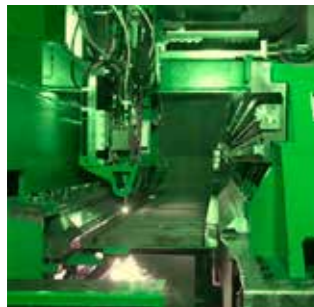
Customer. Posco Gwangyang Steelworks, Korea

Line Type. Continuous Annealing Line

Our solution. LW21M with post heating, filler wire, planishing

The result. DP1200, TRIP1200, TWIP

Technical data. Width: 800 - 1880 mm; thickness: 0.40 - 2.52 mm



Customer. US Steel Pro-Tec Coating Co., United States

Line Type. Continuous Galvanizing Line

Our solution. LW21M with post heating, filler wire, planishing

The result. Gen3 Steel, MS1700

Technical data. Width: 870 - 1670 mm; thickness: 0.60 - 2.7 mm



Customer. Ereğli Demir ve Çelik Fabrikaları T.A.Ş., Turkey

Line Type. Continuous Galvanizing Line

Our solution. ML21M Mashed lap welder with post heating

The result. Automotive quality DP800

Technical data. Width: 800 - 1880 mm; thickness: 0.40 - 2.0 mm



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