/ Perfect Welding / Solar Energy / Perfect Charging

Fronius
SHIFTING THE LIMITS

HIGH PERFORMANCE WELDING.

/ The CMT Twin, Time, LaserHybrid and TimeTwin technologies.

/ Ever since 1950, we've been developing innovative comprehensive solutions for arc welding and resistance spot-welding. Both of them weld processes that stand out for very high speed and deposition rates. Our Cold Metal Transfer process has swept away one old prejudice: that you can't weld aluminium and steel to one another. Day-in, day-out, we're working on our vision: to »decode the DNA of the arc«. No wonder that we're the welding-sector's technological leader worldwide, as well as being the European market leader.

TO MANY PEOPLE, HIGH PERFORMANCE WELDING IS ONLY ABOUT SPEED. WE'VE ADDED SUPERIOR PRODUCTIVITY.

/ Wherever light-gauge sheets need to be welded together at high speed, welding systems from Fronius play an outstanding role. With wirefeed speeds of over 15 metres per minute and deposition rates of up to 8 kilograms per hour in single-wire processes, they meet all possible requirements regarding productivity and precision. What is more, Fronius tandem systems achieve wirefeed speeds of over 30 metres per minute, and deposition rates of up to 20 kilograms per hour. And when it comes to welding thick sheets and plates, Fronius welding systems really flex their muscles, catering to every possible wish regarding cost-effective performance.

INNOVATIVE TECHNOLOGY

/ Products from Fronius are characterised by their high-performing, rugged technology and stable wire guidance. Even at the highest speeds, these ensure 100 % reproducible, visually immaculate weld-seams.

SYSTEM SOLUTIONS

/ If you're serious about exploiting the scope of excellent welding properties and functions to the full, you have to think in terms of systems. In conjunction with our peripherals, the digital power sources constitute thoroughly co-ordinated and extremely innovative high-performance welding systems that cater to every possible wish.

TECHNICAL KNOW-HOW AND MECHANICAL SKILL

/ Perfect welding solutions result from the interplay of several factors: For a start, the welding systems themselves have to be top-class. As well as this, users need to have excellent technical know-how and mechanical skill. We make sure this is the case by giving welders thorough practical training on their new welding systems, on their own premises.

HIGH PROCESS STABILITY

/ Our welding systems have above-averagely long service lives. This is because their high-quality components are all superbly well made and designed for optimum interoperability. Much to the welder's benefit, thanks to the high process stability which is essential for achieving the desired speed and deposition rates.

SERVICE THAT'S NEVER FAR FROM THE CUSTOMER

/ Just like our welding systems, our service staff are high-performers too, with capable teams of applications and service technicians delivering fast, expert 'on-the-spot' advice and support, 24 hours a day, 365 days a year.

WE OFFER YOU WELDING SOLUTIONS THAT ARE ALWAYS A STEP AHEAD.

/ The utmost in product quality, economy and energy efficiency – that's what Fronius stands for. We have mastery of the entire welding spectrum and can guarantee a perfect interplay between all the components of our welding systems. See for yourself!

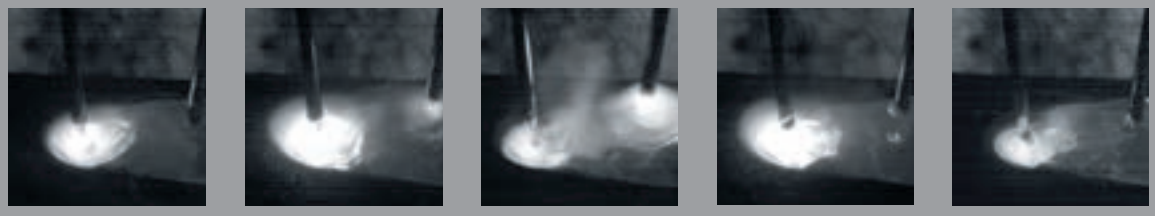
TIME

/ A modified MAG process in which optimisation of the shielding gas and of the stick-out allows the deposition rate to be increased by up to 30 %. The power-source technology has been specifically tailored to the demands of the TIME Process.

CMT TWIN

/ A simplified system configuration and synchronised start-up of two separately controllable power sources, two wire electrodes and a gas nozzle, combined with the tried-and-tested CMT process. Unbeatable arc stability coupled with deep penetration, optimum wetting to sidewalls, and low-spatter welding.

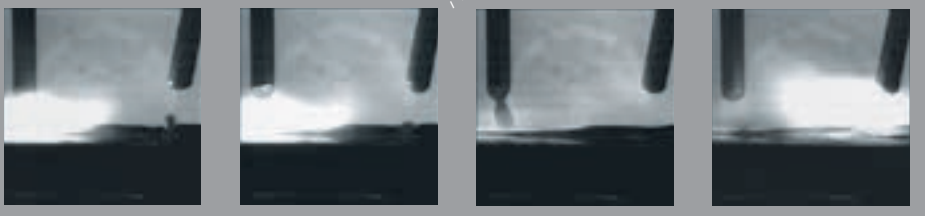
/ CMT Twin weld process



TIMETWIN

/ Is the name of a tandem process in which the weld process is synchronously controlled between two separately adjustable power sources. The two mutually insulated wire electrodes are routed through a single gas nozzle, thereby achieving perfect welding results.

/ TimeTwin welding process



LASERHYBRID

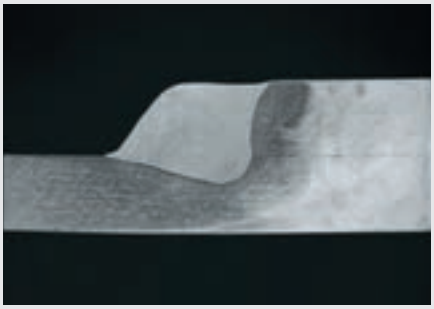
/ This combination of laser and GMA welding makes it possible to exploit the advantages of each process to the full, and to create synergies. The high welding speed and concentrated energy of the laser can be combined with the GMA arc to achieve either of two possible benefits: maximum welding speed on light-gauge sheets, or maximum weld penetration depth on thicker materials.

APPLICATION MODULE CMT TWIN

MAX. WELDING SPEED IN PB POSITION

/ No undercutting
/ Reliable penetration
/ Virtually spatter-free

V_{weld} = 300 cm/min (118.09 in/m)	
V_{wireL} = 15.5 m/min (610.0 in/min)	V_{wireT} = 6.2 m/min (236.14 in/min)
407 A	196 A
28.5 V	15.0 V



/ Steel, 3 mm (0.12 in)

BIGGEST 'a' DIMENSION IN PB POSITION

/ No weldment manipulation needed
/ Ideal weld-seam position (at 45°)
/ Optimised wetting to sidewalls

V_{weld} = 66 cm/min (~26 in/min)	
V_{wireL} = 15.0 m/min (590.29 in/min)	V_{wireT} = 8.0 m/min (314.84 in/min)
391 A	214 A
28.3 V	17.0 V

/ Steel, 10 mm (0.39 in), a = 6

EXTREMELY HIGH PROCESS STABILITY

/ No need for any additional grinding off of the primer coating
/ No weld-seam porosity
/ Virtually spatter-free

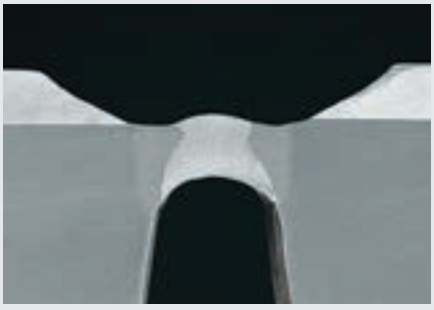
V_{weld} = 200 cm/min (78.61 in/min)	
V_{wireL} = 14.5 m/min (570.94 in/min)	V_{wireT} = 7.5 m/min (295.49 in/min)
374 A	209 A
27.0 V	18.7 V

/ Primered steel, 8 mm (0.31 in), a = 3

PERFECT ROOT FORMATION

/ Homogeneous weld interface
/ Reliable sidewall fusion
/ No weld-pool backing needed

V_{weld} = 120 cm/min (47.2 in/min)	
V_{wireL} = 7.1 m/min (275.49 in/min)	V_{wireT} = 7.5 m/min (295.49 in/min)
374 A	268 A
16.2 V	17.3 V



/ Steel, 8 mm (0.31 in)

APPLICATION MODULE TIMETWIN

HIGHEST-QUALITY METALLURGICAL JOINS

/ Tightly controlled thermal input
/ Low thermal load
/ Extremely low spattering

V_{weld} = 180 cm/min (70.75 in/min)

V_{wireL} = 9.2 m/min	*V_{wireT} = 8.0 m/min*
(354.19 in/min)	*(314.84 in/min)*
230 A	*200 A*
21.4 V	*20.4 V*

/ CrNi, 2 mm (0.08 in)

HIGH SEAM QUALITY

/ On many different thicknesses of metal
/ Reliable root fusion
/ Very low pore formation

V_{weld} = 200 cm/min (78.61 in/min)

V_{wireL} = 12.5 m/min	*V_{wireT} = 11.3 m/min*
(492.24 in/m)	*(432.89 in/min)*
235 A	*213 A*
21.1 V	*20.3 V*

/ Aluminium, 3 mm (0.12 in)

EXTREMELY HIGH DEPOSITION RATE

/ Wirefeed speeds up to 30 m/min
/ Deposition rates up to 22 kg/h
/ Extremely stable arc achieved by fully digitised power-source know-how

V_{weld} = 80 cm/min (31.45 in/min)

V_{wireL} = 15.5 m/min	*V_{wireT} = 15.0 m/min*
(610.29 in/min)	*(590.29 in/min)*
350 A	*340 A*
31.9 V	*31.7 V*

/ Steel, 8 mm (0.31 in)

MULTI-PASS WELD

/ Perfect welding properties in PF
/ Only small included angle needed
/ Higher productivity, as fewer passes are needed

Includes welding parameters from the root, filler and top passes

V_{weld} = 15 - 20 cm/min (5.9 - 7.9 in/min)

V_{wireL} = 8 - 10 m/min	*V_{wireT} = 5 - 8 m/min*
(314.84 - 393.54 in/min)	*(196.79 - 314.84 in/min)*
200 - 250 A	*120 - 200 A*
17.3 - 17.8 V	*15.8 - 17.3 V*

/ Aluminium, 40 mm (1.57 in), PF

APPLICATION MODULE TIME

ECONOMICAL

/ Large ‘a’ dimension with small numbers of passes
/ Reliable penetration behaviour
/ Minimal distortion

Deposition rate 9.6 kg/h (21.16 lb/h)
V_{weld} = 37 cm/min (14.6 in/min)
V_{wire} = 18 m/min (708.34 in/min)
360 A
40 V

/ Steel, 15 mm (0.59 in), 3 passes, PF, a = 12

NARROW-GAP WELDING

/ Good accessibility
/ Reliable sidewall fusion
/ Highly economical, thanks to lower number of passes compared to MAG

Beads 1 and 2:
Deposition rate 6.4-8.5 kg/h (14.1-18.7 lb/h)
V_{weld} = 47/60 cm/min (18.5/23.6 in/min)
V_{wire} = 12/16 m/min (472.24/629.64 in/min)
210/310 A
34/37 V

Beads 3/4/5/6:
Deposition rate 11-12.3 kg/h (24.3-27.11 lb/h)
V_{weld} = 30 - 46 cm/min (11.8 - 18.11 in/min)
V_{wire} = 20 - 23 m/min (787.04 - 905.09 in/min)
390 - 420 A
42 - 46 V

/ Steel, 12 mm on 25 mm (0.47 in on 0.98)

POSITIONAL WELDING

/ High weld-metal deposition, even in overhead position
/ Fine wetting to sidewalls
/ Reliable fusion of the root edge

Deposition rate 4.8 kg/h (10.58 lb/h)
V_{weld} = 40 cm/min (15.7 in/min)
V_{wire} = 9.0 m/min (354.19 in/min)
250 A
31.5 V

/ Steel, 10 mm (0.39 in), a = 5

EXTREMELY HIGH DEPOSITION RATE

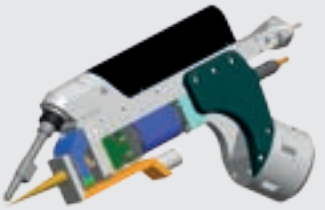
/ Perfect penetration cross-section
/ No undercutting
/ Distortion minimised by low thermal input

Deposition rate 16.2 kg/h (35.7 lb/h)
V_{weld} = 45 cm/min (17.72 in/min)
V_{wire} = 30 m/min (1180.54 in/min)
520 A
51 V

/ Steel, 20 mm (0.79 in), PA, a = 8

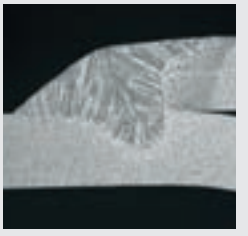
APPLICATION MODULE LASERHYBRID

10 kW WELDING HEAD
/ New design for a focal length of 300 mm (11.8 in) and 10 kW of laser power



/ Steel, 12 mm (0.47 in)

4 kW WELDING HEAD
/ 10-year track record of successful deployment in the automobile industry.



/ Steel, 2.7 mm (0.1 in)

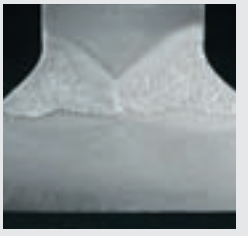
90° 4 kW WELDING HEAD
/ Angled design for optimum accessibility, e.g. in automotive axle production

/ Steel, 2 mm (0.08 in)

90° 8 kW WELDING HEAD
/ Ensures optimum accessibility in pipeline-construction projects

/ Steel, 12.3 mm (0.48 in)

10 kW WELDING HEAD
/ Optimum head-geometry for single-sided root fusion on steel sheets up to 10 mm (0.39 in) thick.



/ Steel, 16 mm (0.63 in)

CMT TWIN: THE THRIFTIEST WAY TO WELD.

WIREFEED SPEED

/ VR 1550 wirefeeder with 4-roller drive for smooth, precision feeding of the filler metal – regardless of where the wire is being fed from (bulk wire container or wire-spool).

DIGITALLY CONTROLLED MIG/MAG WELDING POWER SOURCES

/ The two digitally controlled CMT welding power sources are perfectly attuned to one another by the unique system/process technology of CMT Twin. They come with a package of ideal characteristics covering every possible application.

COOLING UNIT

/ The rugged and reliable FK 4000-R cooling unit is designed to dovetail with the modular concept of the welding system as a whole.

/ CMT Twin is based on the same set-up as the tried-and-tested TimeTwin process: two power sources, one torch and two mutually insulated contact tips (‘Lead’ and ‘Trail’). To which have been added the outstanding welding properties of CMT. CMT Twin scores top marks for its high welding speeds and easy-to-use process control.

TORCH HOLDER

/ Developed specifically for CMT Twin, the torch holder allows the two CMT Drive motors to be arranged in a way that minimises the obstacle contours.

WELDING TORCH

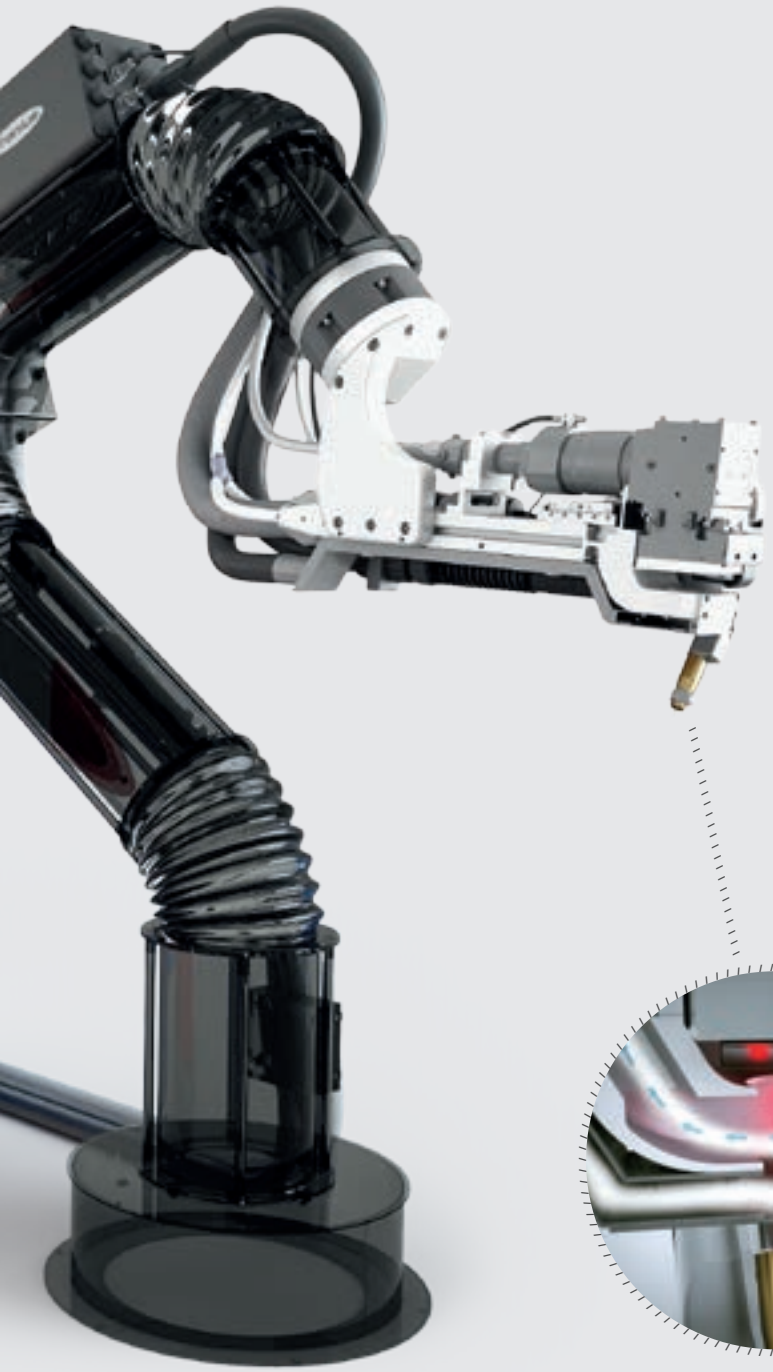
/ A tandem torch optimised for the high-performance power range, the new Twin Compact Pro is highly versatile. This is made possible by the perfectly matched torch packages. The compact design of this water-cooled torch, with its two mutually insulated electrodes, provides very good weld accessibility.

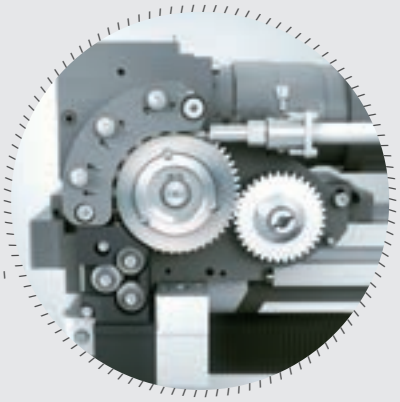
LASERHYBRID: THE ADVANTAGES OF THE FULLY DIGITISED MIG PROCESS COMBINED WITH THE BENEFITS OF LASER WELDING.

DIGITALLY CONTROLLED POWER SOURCE

/ LaserHybrid functions with a TPS 5000 welding power source. In order to fulfil the special requirements of LaserHybrid, the TPS 5000 comes equipped with a package of special characteristics.

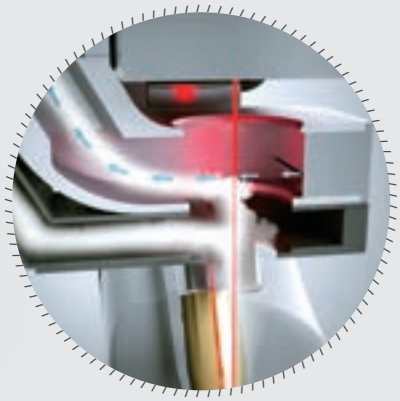
/ Fronius LaserHybrid, the laser-MIG process from Fronius, unites the advantages of the industrial-scale MIG and laser-beam welding processes. And does so without taking on any of the disadvantages of either process. Fronius LaserHybrid marries the excellent gap-bridging ability and easy weld-seam preparation of MIG welding with the low thermal input, deep penetration and speed of the laser process. With Fronius LaserHybrid, it is possible to carry out automated joining of different aluminium and steel items at speeds of up to 8 metres per minute, in superlative quality.





WELDING HEAD

/ The integral wire straightener ensures precision wire positioning in the Fronius 90° 4kW welding head. Developed specially for axle production, this welding head provides optimum weld accessibility.



FRONIUS CROSSJET

/ All Fronius LaserHybrid-welding heads come with the patented enclosed CrossJet system. This unique system reliably prevents soiling of the protective optical glass, thereby ensuring optimum system availability.

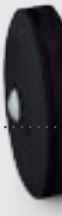
TIME: 30 % HIGHER DEPOSITION RATE THAN CONVENTIONAL MAG WELDING.

TIME MANUAL WELDING TORCH

/ The 2-circuit cooling system ensures optimum cooling. Thanks to the continuously adjustable contact tip, this welding torch permits an extremely long stick-out (of between 15 and 25 mm). The longer stick-out means that the wire is heated up very strongly, allowing extremely high wirefeed speeds to be achieved, yet at a low amperage.

DIGITALLY CONTROLLED MIG/MAG-WELDING POWER SOURCE

/ Higher performance also means that more power is required from the power source: The TIME 5000 Digital has an extremely long duty cycle, with possible working voltages of up to 48 V and a wirefeed speed of 30 m/min.



COOLING UNIT

/ If you have more power, you need more cooling. The rugged and reliable FK 4000 cooling unit is designed to dovetail with the modular concept of the welding system as a whole.

/ The TIME Process is a technically more advanced version of the conventional MAG process. It has a long and successful track record in industry, for both manual and mechanical applications. The difference from conventional MAG welding is that the TIME Process has a longer wire stick-out on the welding torch, and a higher wirespeed. As a rule, it is possible to work with 2-component shielding gas. However, we recommend admixing helium for seams with an 'a' dimension above 8 mm, for metal thicknesses from 25 mm upwards, and for penetration cross-sections greater than 50 mm².

3-PARAMETER CONTROL

/ The 3-parameter control makes for very easy handling of the entire welding process. This ensures that start-up, lowering to the required welding power and end-crater filling are all carried out with complete process-reliability.

WE HAVE THREE DIVISIONS AND ONE PASSION: SHIFTING THE LIMITS OF POSSIBILITY.

/ What Günter Fronius started in 1945 in Pettenbach, Austria, has now become a modern day success story. Today, the company has around 3,000 employees worldwide and has been granted more than 1,000 patents. Our goal has remained constant throughout: to be the innovation leader. We shift the limits of what's possible. While others progress step by step, we innovate in leaps and bounds. The responsible use of our resources forms the basis of our corporate policy.

PERFECT WELDING

/ We develop products and complete systems - both manual and automated - as well as the corresponding services for our customers in the global welding technology market. We have made it our goal to decode the "DNA of the arc".

SOLAR ENERGY

/ The challenge is to make the leap to a regenerative energy supply. Our vision is to use renewable energy to achieve energy independence. With our services, inverters and energy-storage systems for optimising energy yields, we are one of the leading suppliers in the photovoltaics sector.

PERFECT CHARGING

/ As know-how leaders in the world of battery charging, we deliver exceptional solutions to create the maximum benefit for our customers. For the intralogistics sector, we are committed to energy flow optimisation for electric forklift trucks and are constantly striving for the next innovation. Our powerful charging systems for vehicle workshops guarantee safe and reliable processes.

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