

weld+vision

FRONIUS MAGAZINE

1.05



CONCENTRATION:

How to stay in control in a world of sensory overload

ACTIVE WAVE: Two new systems that can do even more

TOUGH JOINTS: Autobody repairs on high-strength sheets

PRAGUE: The cultural metropolis at the centre of the world welding community





Management Team, from l. to r.:

Herbert Mühlböck
 Klaus Fronius
 Brigitte Strauss
 Volker Lenzecker
 Elisabeth Engelbrechtsmüller-Strauss
 Heinz Hackl

Dear Readers;

Strength from Stillness – this is the motto of a Fronius TIG welding system that ensures the lowest possible noise levels at the highest possible output power. In times like ours, in which the din of our high-decibel civilisation, with its 24/7 media bombardment, is getting worse and worse while “peace and quiet” are becoming an ever-scarcer commodity,

anything that cuts down the noise can only be a good thing. As well as being a welcome first step towards more concentration. Because noise distracts our attention. Peace and quiet help to focus it. On what's important, on the essentials, on the core of the matter. This will be the theme of this edition's cover story, which will be all about

“concentration”. Of course, we shall also be introducing you to the low-noise series of machines that we've just mentioned. There are three case studies waiting for you, a conversation with Klaus Fronius on the subject of energy, and much more besides.

Here's wishing you a pleasant, quiet read!

A few words on our cover picture:

Attentiveness and inner calm – these are the skills taught by Xiao Ping Zhang in Vienna. A master of Tai Chi, this Chinese emigré thus also symbolises the theme of this latest edition of weld+vision: The art of concentration. In the face of the rising flows of information washing over today's workplaces, this is a skill that is becoming ever-more important. In Tai Chi, it finds expression in supple movements. And at the workplace, it is most likely to be seen in a steady, even-tempered manner. On the following pages, we'll let you into the secret of which factors you need to watch out for, and what concentration means for a company like Fronius.

Publisher's imprint:

*"weld+vision" is the customer magazine of Fronius International GmbH
 Design: reklamebüro GmbH
 Responsible for contents: Fronius International GmbH, Buxbaumstrasse 2, A 4600 Wels, Austria, weld.vision@fronius.com, www.fronius.com
 Registered trademarks and tradenames have not generally been identified as such. The absence of any such identification does not mean that the name in question is an unregistered name for the purposes of product and trademark law.*

Contents

3-6	Cover story Strategies for inner calm
7-11	Totally R&D TIG welding with 500 A Digital high-performance welding Cel MMA welding up to Ø 3.25 mm
12-13	Brief and to the point News from Fronius
14-19	Case study MIG brazing in the autobody workshop Pipeline construction: At -50 °C, speed is what counts Robot welding – OK for small lots, too
20-21	The company Energy solutions for the future
22-23	Travel tip Prague – off the tourist trail

The art of concentration

THE CARDINAL VIRTUE IN THE EARLY 21ST CENTURY



As different as industrialised societies may still be at the beginning of the 21st century, they nevertheless have two things in common: The first is a constantly rising tide of “ambient noise”; the second, an incredible acceleration of the rhythms of our lives and our work. Calmness, in the sense of concentration, is becoming a virtue. This is what it is all about at Fronius – and in the article that follows.

Active Wave – Strength from Stillness

Something else that aids concentration is the Active Wave series of machines from Fronius. Their complete digitisation brings a further benefit: Peace and quiet. A digital signal processor makes for a maximum of arc-stability, coupled with a minimum of noise. Read more on Page 7 onwards.



Concentrated knowledge for all

A Fronius “Schweissercafé” (“welders’ café”) is consciously created as a place for communication. A physical space – architect-designed with great attention to quality and detail – that deliberately takes staff out of their “normal workday environments”. The “Schweissercafé” helps people to relax – and in so doing, helps them to concentrate. What is more, there is a huge amount of welding knowledge concentrated in these places, by way of computers and Intranet access, which is more than helpful to the cause!

con·cen·tra·tion: noun

1. The act or process of concentrating : the state of being concentrated; especially: a directing of the attention or of the mental faculties towards a single object. 2. A concentrated mass or thing. 3a. The amount of a component in a given area or volume; b. the amount of a dissolved substance contained in a solution (chem.).

The increasing din of our high-decibel civilisation, combined with an unprecedented, incessant barrage from the media, has made “calm” into a scarce and precious commodity that can only be attained by making a conscious effort. The same goes for “stillness” in the sense of “absence of motion”: Driven by technological development, the rhythms of our lives have accelerated to such a degree that it has become difficult or sometimes even impossible to slow down, pause or take a break.

Worse still: “I think modern life has fundamentally ... changed our sense of time. Even as we live longer, we seem to think shorter”, concluded the American publicist Esther Dyson in a recent online article. “It used to be that machines automated work, giving us more time to do other things. But now machines automate the production of attention-consuming information, which takes our time. Those quiet “in-between times” have vanished from our everyday lives, making every minute not used productively into an opportunity cost. This influences the way we think.”



Tai Chi – another booming Chinese export.

Even in places a long way from the Far East, this meditative motion technique has come to enjoy great popularity. The slowly flowing movements of the whole body are derived from the martial arts. When executed in slow motion, however, they are regarded as excellent relaxation methods for body and mind.

Tai Chi expert and “concentration master” Xiao Ping Zhang has been involved with Tai Chi ever since he was 11. This Chinese Wushu (= Kung Fu) instructor taught at the School of Chinese Medicine in Fujian and won numerous distinctions at Tai Chi tournaments. He came to Vienna in 1989, where he now runs a school for Tai Chi, Qi Gong and Wushu. (Studio Zhang, office: Störckgasse 90/12-15 A-1210 Vienna; course venue: Kremsergasse 1/2, A-1130 Vienna, zhangxp@aon.at)

Strategies to counter undesirable stimuli

Phenomena such as these are increasingly driving both people and organisations to the limits of what they can tolerate. The question is, what strategies can we use to defend ourselves against the plethora of undesirable stimuli to which we are exposed day-in, day-out?

One very important approach is “concentration” – on the level of both individuals and organisations. What does concentration mean? An “aggregation of economic or military force”; “mental composure”; “great mental exertion”; “systematic direction of the attention to a single object”.

What the dictionary does not mention, however, is the radical “reduction” that concentration always entails.

Concentration as a personal risk

For individuals, concentration will always mean selecting and focusing on what is important to them, and disregarding what is not. And knowing which actions, tasks and jobs have top priority, and when.

The key here is to identify for oneself what is essential, and to filter out everything else. These two steps towards concentration – recognising the essential and leaving out the non-essential – also entail a certain risk, then. Because in this way, of course, one cannot keep all one’s options open. One is forced to take a decision and to deliberately rule out various possibilities.



Concentration at the level of organisations

Organisations in general, and companies in particular, approach “concentration” from two different angles: Firstly, a company, too, must concentrate on one goal, activity and strategy, which implies “passing up” other potential opportunities.

Secondly, a company must create the overall conditions – in terms of time and space – which will permit its employees to focus their attention fully and completely on just one thing. This, in turn, will be underpinned by the cultural

values of the company: For example, allowing staff times when they cannot be got hold of, and in which real concentration becomes possible in the first place. It is, after all, so easy to be distracted - be it by the 'phone ringing at the wrong moment, by negative stress, by time constraints, decision-making pressure, information overload or noise. All these things have the very counter-productive effect of “de-railing” our trains of thought.

Ideally, then, a company will facilitate concentration by creating spaces (also in the physical sense of the term) into which its people can withdraw. This is

the clearest possible signal it can give of the cultural “desirability” of concentration.

It is only then that some further, absolutely crucial factors can come into play – factors that are inseparably linked to “concentrating on the essential”: perseverance and endurance.

High-end TIG welding

THE FOUR BIG PLAYERS OF THEIR CLASS



The MagicWave 4000/5000 and TransTig 4000/5000 are powerful, totally digitised welding systems for TIG welding at up to 500 amps. They are equally well suited to robot and manual welding. All-round professionals with minimal noise emissions, yet an extremely stable arc at all times. The key technology for all this is Active Wave.

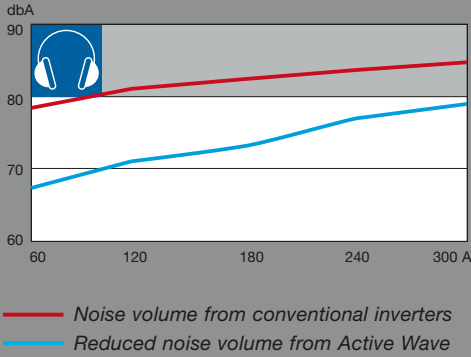


Reach for the stars

The welding systems in TIG welding are the MagicWave 4000/5000 for DC and AC, and the TransTig 4000/5000 for DC. Thanks to digitisation, extensive expert knowledge has been built into the machine concept, in a well-structured, easy-to-understand way. If you are really interested in high-end welding, you shouldn't settle for second-best.

From ignition right through to the end of the weld, from tacking to cap-shaping, from the system components to the cost effectiveness – everything has to be just right. Has to be – and is.

Active Wave: Strength from Stillness



Good work calls for complete concentration. Background noise can badly impair it, however. dbA values of over 80 are deemed to be stress factors. And who can concentrate on their work properly under stress? With Active Wave, the dbA value is always below 80 dbA - even when the machines are putting out 300 A of power. This relative "stillness" in TIG-AC welding is made possible by Active Wave. What this means is a digital signal processor that always computes - in real time - the waveform that will permit the highest possible arc stability with the lowest possible noise-emission levels. Meaning below 80 dbA, of course. And the people who best understand just how pleasant this is are welders themselves, of course.



MagicWave 4000/5000 and TransTig 4000/5000: Powerful systems for TIG welding at up to 500 A.

Ignition with and without touchdown

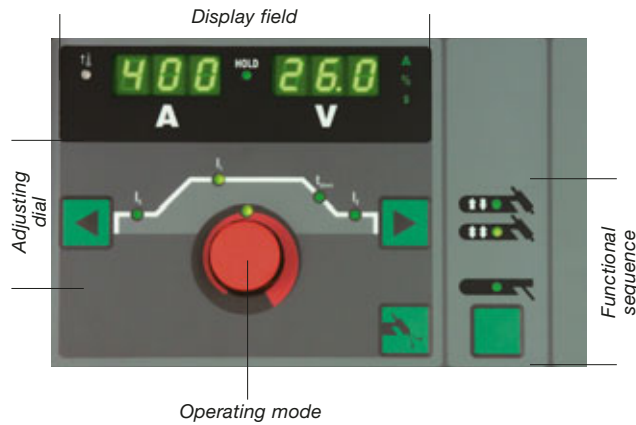
The ignition plays a big rôle in TIG welding. In touchless ignition, the arc is immediately ignited - at the first push of the button - by a high-voltage impulse, no matter how long the hosepacks are. The touchdown ignition is controlled by the digital process-control. There are no tungsten inclusions, not even when working in sensitive areas of application.

Many functions - one machine

The TAC function tack-welds spot-by-spot. This is quicker and easier than with a continuous arc, and does not need any filler metal. To be welded, aluminium needs a special program - and Fronius have made sure that it gets it. The MagicWave machines use a pointed electrode with a much smaller shaped cap, resulting in perfect root fusion. At the end of welding, the ideal post-flow time is calculated automatically by the digital microprocessor - which also controls the crater-fill process.

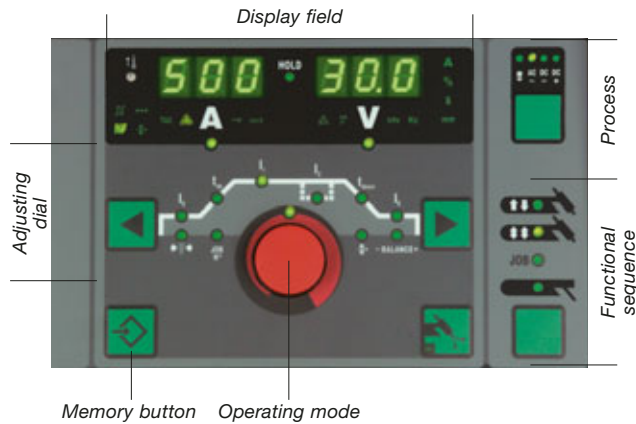
TransTig control panel:

The extensive know-how stored in the systems can be intuitively retrieved, and the control panel is self-explanatory and straightforward.



MagicWave "Job" control panel:

The "Job" variant offers extra functions such as job-mode, and supports cold-wire control and automated applications.



Convenience all the way

Working at the push of a button – this is just one aspect of the MagicWave and TransTig machines: practically self-explanatory, easy-to-use control panels; only the functions that are actually needed are activated; extensive range of remote-control units, each tailored to different tasks. As well as the "Standard" version, you also have the option of selecting the "Job" variant, which supports extra functions such as Job mode. "Job" also enables cold-wire control and automated applications.

The other aspect is that all the system components are designed for inter-operability, making a complete system: Welding torches with integrated remote-control, robot interfaces, weld-data documentation and visualisation. Not forgetting economy, of course: e.g. thanks to automatic cooling-unit cut-out, automatic cap-shaping function, small numbers of wearing parts etc. With this in mind: If you reach for the stars, be prepared to actually reach them ...

Facts

Active Wave technology boosts profitability:

- Whole system is totally digitised: power source, welding torches, remote-control units, robot interfaces, PC tools.
- Digital signal processor (DSP) regulates and controls the welding process.
- Available in both "Standard" and "Job" versions. "Job!" offers extra functions such as job-mode, and supports cold-wire control and automated applications.

Field of use

Materials

- Aluminium and its alloys
- Non-ferrous metals
- Low and high-alloy steels

Applications

- Manual welding
- Robot welding

Sectors

- Construction of chemical plant, tanks and vessels, machinery and plant
- Automotive engineering and construction of railway rolling stock
- Aerospace
- Site-erection contractors, maintenance and repair firms
- Pipeline construction
- Shipbuilding

Technical data

MW 4000 / TT 4000

- Welding current range

TIG	3 – 400 A
MMA	10 – 400 A
- Welding current at:

10 min/40 °C, 45 % d.c.	400 A
10 min/40 °C, 100 % d.c.	310 A

MW 5000 / TT 5000

- Welding current range

TIG	3 – 500 A
MMA 1	0 – 500 A
- Welding current at:

10 min/40 °C, 40 % d.c.	500 A
10 min/40 °C, 100 % d.c.	350 A



15 years old, 6 months young

TIME PROCESS NOW FULLY DIGITISED



Josef Kreindl spoke to w+v about the TIME Process.

The TIME 5000 Digital

Field of use

30 % greater economy in welding steel plates, thanks to increased wirespeed or a higher deposition rate.

Materials

- Unalloyed and low-alloy steels
- Fine-grained structural steels
- Low-temperature resistant steels

Sectors

- Construction of plant, tanks and vessels
- Manufacture of special vehicles and construction machinery
- Mechanical engineering and structural steelwork
- Shipbuilding

Technical data

- Welding current range

MIG/MAG	3 – 500 A
TIG	3 – 500 A
MMA	10 – 500 A
- Welding current at:

10 min/25 °C, 100 % d.c.	450 A
10 min/40 °C, 100 % d.c.	360 A
- Dimensions

LxWxH mm	625 x 290 x 475 mm
----------	--------------------
- Weight

	37.4 kg
--	---------

Fronius' first high-performance welding process, the still very widespread TIME Process, is now also available in the form of digital equipment technology: The Time 5000 Digital welding system - a modern-day classic.

When you consider how short-lived most technological innovations are, it is remarkable that the TIME high-performance welding process is still going strong, and indeed is still in great demand. It was launched by Fronius 15 years ago. weld+vision spoke to someone who was involved right from the outset: Josef Kreindl, Head of the Technology Centre in Wels.

w+v: Mr Kreindl, you've been at Fronius for 15 years now, and have been involved in TIME right from the word "go". Perhaps one could say that you "witnessed the beginning of TIME"!

JK: Yes, that's one way of putting it – I was certainly one of a team of people that helped TIME see the light of day.

Fronius took some novel approaches here. For the first time ever, it was not the equipment itself that was paramount, but the application.

w+v: Why has the TIME welding process been digitised?

JK: Here at Fronius, digitisation is almost standard by now. With digitisation, the welding properties and ease of operation have taken a giant leap forward: 100 % reproducibility of all welding results; updates via laptop, at any time; microprocessor control; multiprocess capabilities – the machine is suitable for all materials and processes.

w+v: Mr Kreindl, what is the main advantage?

JK: In manual welding, we're talking

about boosting efficiency by around 30 %. In the mechanised field, the increase in performance in some cases will be even greater. This increase is achieved by raising the wirefeed speed. Another really good thing about this process is the much better weld-seam quality you get when welding unalloyed and low-alloy steels.

w+v: *What is the main difference between TIME and other processes?*

JK: Well, to begin with, there is the longer stick-out. In GMA welding, it's usual to have a stick-out of between 10 and 12 mm. In TIME welding, the stick-out for a 1.2 mm wire is between 15 and 25 mm. This causes the wire to heat up very strongly, permitting either faster wirespeeds or higher deposition rates. Secondly, there is the use of special shielding-gas mixtures, which are now available from many gas manufacturers.

w+v: *Could you give us some examples?*

JK: It depends on the application. Gases based on argon/CO₂, for instance, or the 3 or 4-component gas argon/CO₂/O₂/helium. The deciding factors are the sheet thickness and the quality requirements.

w+v: *The TIME 5000 Digital was unveiled in January 2005. Has there been any feedback yet?*

JK: Yes, the machine has been tested in Ireland, for example. The feedback has been very positive, especially regarding the welding properties, design, and ease of operation. I have no doubt that we shall see a re-run of the success that TIME enjoyed in the 1990's.

w+v: *Mr Kreindl, thank you very much for the interview.*

Handy power

*TRANSPORT 1200:
MMA WELDING UP TO Ø 3.25 MM*



Making smooth, perfect work of difficult tasks – this is the job of the integrated “resonant intelligence” technology.

Fronius' outstanding series of MMA welding units has now been complemented by a further product: the TransPocket 1200. An extremely sturdy electrode power source that packs an unusually powerful punch: 120 A, even though it weighs only 3.7 kg.

That's 10 A more than the smallest member of the family. But these 10 A make a big difference: All types of electrode can be welded, even Cel electrodes with a diameter of 3.25 mm. Because you always have enough power up your sleeve.

Ingenious technology

“Resonant intelligence” automatically ensures an ideal output characteristic and thus a stable arc. Even where the mains supply lead is over 50 m long.

Among the other features are anti-stick and hot-start functions, arc force control, generator compatibility, thermostat-controlled fan, overtemperature indication and protection, and continuously adjustable welding power.

[www](http://www.fronius.com) 

You'll find more details on the TransPocket units at www.fronius.com/tp1200

News

Concentrated production



The 100,000 m² site pictured above is where the Fronius company is planning a milestone for its future: the Group's biggest logistics and production location. To mark the start of the project in November 2003, a chestnut tree was planted on the building plot. The groundbreaking ceremony for this approx. 34,000 m² construction project will be taking place in May. Its aim is to concentrate the majority of Fronius' locally scattered production units at one single location: Sattledt. This will, firstly, send out a clear signal of Fronius' continued commitment to producing in Austria. Secondly, the aim is to streamline and optimise our internal logistics still further, so as to give our customers an extra time advantage. This concentration of activities in Sattledt will entail a number of changes for the production-plant network, especially as far as Český Krumlov is concerned: In future, Český Krumlov is to be the centre of expertise for transformer manufacturing; in return, its assembly line is to be relocated to Sattledt.

From 2006, Fronius will be producing and dispatching all its battery charging systems, welding systems and solar inverters from this new system location.

World's longest welding bead



Last year, a new world record was established in Düsseldorf, Germany: A 1001 m long welding bead. This is more than twice as long as the previous world record. This big event was initiated by welding publishers DVS, the Düsseldorf Chamber of Crafts and the Institute of Welding-Engineering Education, and some 500 welders and thousands of visitors took part. The bead was welded on two parallel U-section steel girders which were arranged in five 48 m long double strands that meandered up and down the Gustaf-Gründgens Square in the centre of town. Fronius was involved as one of the sponsors, and loaned 10 welding machines to be used at the event: Five MagicWave 2200's and five TransPuls Synergic 2700's.

[www](http://www.fronius.com/future) 

From June, you will be able to keep an eye on how the building work at the new site in Sattledt is progressing: www.fronius.com/future

New LaserHybrid centre goes into action



The newly fitted-out LaserHybrid centre was unveiled in the Technology Centre at Fronius' sales & marketing site in Wels back in the autumn of 2004. Ultimately, there will be three completely equipped LaserHybrid cells available here. Since the beginning of 2005, it has been possible to carry out all training courses, demonstrations and client-specific project work at the sales & marketing site in Wels. The activities here are looked after by Franz Samer and Michl Matthias. Continuing to develop and refine this process is still one of the main tasks of the Fronius development team. Great interest is being shown – so far, around 50 installations have been sold.

Important expo dates:

Beijing Essen Welding and Cutting:
25th – 28th May 2005, Shanghai, China

58th Annual Assembly and International Conference of International Institute of Welding: 10th – 15th July 2005, Prague, Czech Republic

Schweissen und Schneiden:
12th – 17th Sept. 2005, Essen, Germany

Brand-new premises for Fronius Vienna



The new Vienna facility has only just been opened: 16 staff moved into the new building in March 2005. It took only one fast-moving year to get from the architect's first drawings to actually moving in. The cheerful modern architecture goes a long way towards meeting customers' requirements: High-quality, sophisticated demonstration and lecture room, prestigious reception area in the entrance hall (complete with "Schweissercafé" and service check-in desk, making it the communicational centre), convenient loading and unloading. Also, the two separate sales teams both work in the same office building – meaning short decision-making channels and direct access to the stock of demo machines. This enables every sales adviser to respond flexibly to clients' special wishes.

Sales meeting at Fronius Solar Electronics



On 10th and 11th February this year, the Solar Electronics Division held its 2nd international sales partners' meeting in Wels. Representatives of 27 wholesalers from 11 countries, taking in anything from A for Australia to Z for Zurich, came to the meeting. The two days were a mixture of product presentations and cultivating personal relationships. The highlight was the new FRONIUS IG 500 central inverter. Marketed under the motto "Your own solar power station", this unit is perfect for PV installations with a nominal capacity of 28 kW and above. The event was rounded off by a visit to a nut-liqueur distillery, and then a round of "Eisstockschiessen" (a game a bit like curling, played on ice). Great spirits – great memories.

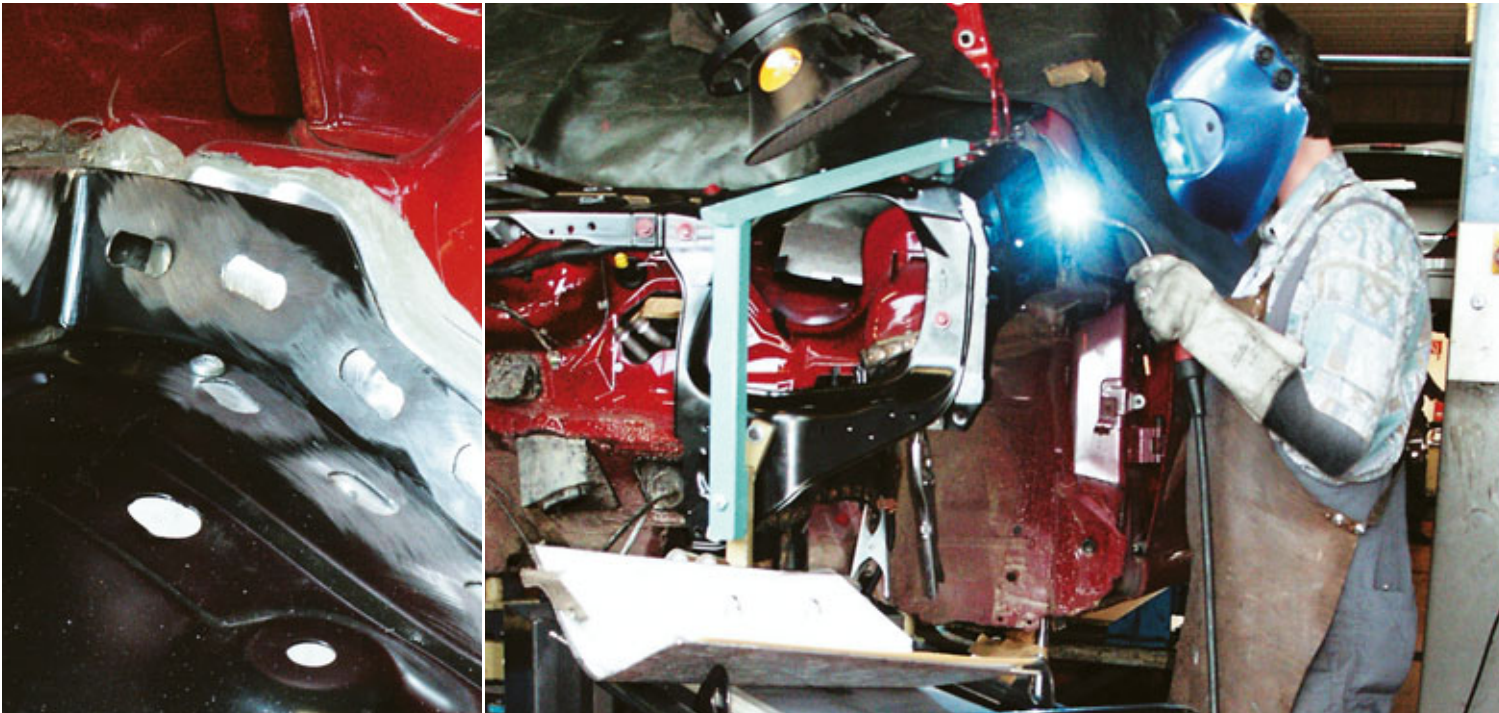
Fronius battery charging systems for the Hong Kong fire brigade



205 Acctiva Professional starter-battery charging units were dispatched to Hong Kong last year. The lucky recipient? The Hong Kong fire brigade. Or, more accurately, around 100 of its fire-fighting vehicles. The enquiry for this major order came via Internet. The requirement was for high-performance starter-battery charging units – two per vehicle. The Hong Kong trading company Action Engineering offered the Fronius products, and won the contract. Since when, Acctiva Professionals have been out on every single mission in this city of 7.5 million inhabitants, ensuring that the Hong Kong fire brigade is always ready to spring into action straight away.

For us, customer satisfaction comes first

CUSTOM CHARACTERISTICS FOR TOP-QUALITY BODYWORK REPAIRS



Repair work on high-strength galvanised sheets makes very special demands of the power source.

At Opel, gas-shielded brazing is the ultimate in processes for joining bodywork panels. Since the launch of the Vectra C, this process has largely superseded MIG/MAG welding. Opel dealership Autohaus Franken KG also uses the MIG brazing process. The TransPuls Synergic 2700 GM welding system “pulls all the stops” here: It is easy to use, comes with a “recipe book” of specific characteristics, and offers 100 % reproducibility – ensuring that bodywork repairs can be carried out to maximum customer satisfaction.

3500 regular customers, 50 employees – 2 of them autobody engineers – 11 apprentices and 100 cars per week in the service department. These are some of the key figures of Autohaus Franken, a big Opel garage in Ansbach (near Nuremberg), Germany. The company co-operates very closely with Opel – not least because the latest Opel vehicles differ from their predecessors in terms of the production technologies and bodywork-repair methods used.



This Opel dealership is a fourth-generation family enterprise. Two years ago, a quality management system was introduced with the aim of putting make-or-break factors such as quality, service orientation and customer satisfaction on a firm long-term footing. As part of this, Autohaus Franken decided to bank on the TransPuls Synergic 2700 GM welding system for bodywork repairs.

Galvanised steel sheets, some of them of the high-strength variety, ensure high vehicle durability, quality and economy.

For this Bavarian family firm, being technologically up-to-date is a matter of course. "Autobody work is one of our core areas of expertise, and we always follow Opel's instructions to the letter", affirms service manager Kurt Endress.

Perfect MIG brazing in the autobody workshop

For safety reasons, Opel insists on MIG brazing using the TransPuls Synergic 2700 GM welding system. When repairs are carried out on the high-strength galvanised sheets, both the strength values and the corrosion resistance must be preserved. To this end, MIG brazing or resistance spot-welding are used.

"Investing in resistance-welding equipment would never pay off for us", says junior boss Peter Ulrich. "The TransPuls Synergic 2700 GM welding system is very much more cost-effective. What is more, this system from Fronius also supports all MIG and MAG processes".

A complete set of stored parameters ensures quality and reproducibility

Using the TransPuls Synergic 2700 GM gives the workshop all sorts of different advantages. The various operating points are pre-saved and are easy to retrieve. The results are of the very highest quality, and are 100 % reproducible. Ultimately, this is what customer satisfaction results from.

Asked what tip he would give to colleagues looking for a suitable welding system for MIG brazing, Peter Ulrich answers without hesitation: "Look for ease of operation and good-quality service. We tried out several different machines before we made our decision. And that's why I can wholeheartedly recommend the Fronius machine".

The TransPuls Synergic 2700 GM

Technical data

- Welding current range	3 – 270 A
- Welding current at:	
10 min/25 °C, 100 % d.c.	210 A
10 min/40 °C, 100 % d.c.	170 A
- Degree of protection	IP 23
- Dimensions	
LxWxH mm	625 x 290 x 475 mm
- Weight	27.5 kg

Processes

- MIG brazing
- MIG/MAG pulsed-arc welding
- MIG/MAG standard welding
- TIG-DC welding
- Manual-electrode (MMA) welding

High performance at high latitudes

PIPELINE WELDING IN THE CANADIAN NORTH



Louisbourg Pipelines of Mississauga, Ontario recently built an oil pipeline for its client Transcanada, of Calgary, Alberta. Fronius, together with system integrator CRC Evans Pipeline International Inc. of Houston, Texas, won the contract for the 2 km long Peerless Lake pipeline looping operation, near the remote community of Wabasca in Northern Alberta.

The custom system solution was developed for use in arctic conditions, including the "TPS 4000 Pipe" power source and the Thermobox for power sources and cooling units.



Under extreme arctic conditions, 182 pipeline joints were welded in only five days.

The seven passes per joint were welded in four separate operations, all carried out inside tents.



Higher productivity was the key

Thanks to its convincing argument of significantly higher productivity, Fronius has managed to break into the tough North American pipeline construction market. The American and Canadian clients were won over by the enduring cost superiority of Fronius' solution, and the merits of its specially developed system.

Custom solution for deployment under arctic conditions

In view of the extreme climate and difficult working conditions found in Northern Canada, Fronius developed customised equipment for pipeline welding. The digital system solution was given thorough testing by independent agencies.

The custom solution is complemented by the relevant welding programs. Four different set-ups are available, as necessitated by the application in question: Single (single-wire), Dual (single-wire), Single Tandem and Dual Tandem. The Peerless Lake project used the Single Tandem variant, with a deposition rate of 35 kg/h.

Welding speed four times faster, and high quality

The decisive argument for TimeTwin Digital, and thus for the Fronius solution, is the time gains that it brings: The welding time with this process is slashed by a factor of four. From two hours to just half an hour. Every day, the pipeline welders completed approx. 40 joints. This made it possible for the whole project – comprising 182 joints – to be finished in only five days, at outside temperatures of around -50 °C.

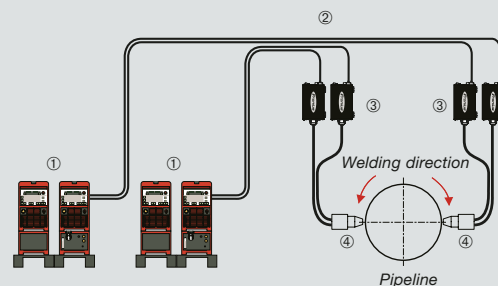
One factor which might have made it more difficult to use these welding systems in the field was the mains-independent power supply. However, despite the fluctuations in the supply voltage and frequency, the welding properties were not affected. The continual digital regulation of the welding parameters ensured that the weld-seam quality remained constant. Automated ultrasonic testing (AUT) revealed a defect rate of less than 4 %.

Which accounts for the pleased reaction from Transcanada's pipeline integrity specialist David Hodgkinson: "The Fronius seams are of high quality, with hardly any defects. The result is uniformly good throughout the entire length. This is the first time we have ever had a project with so many new techniques and materials and such good results."

Peerless Lake project

For the Peerless project – named after a lake near Wabasca, Canada – the clients chose the Single-Tandem variant. The welding process is organised as follows: Two TimeTwin Digital Pipe systems start welding at the apex of the pipe joint and each weld half an orbit, on opposite sides of the pipe, until they meet at the bottom.

Two TimeTwin torches, each with two wire electrodes, weld simultaneously.



- ① TimeTwin Digital Pipe system, TransPuls Synergic 4000 MV Pipe, FK 9000R Pipe cooling unit
- ② "Pipe" interconnecting cable
- ③ "VR 1500 Pipe" wirefeeder unit
- ④ Robacta Twin Pipe welding torch

The joints of this 36-inch, X-100 steel pipeline were welded in seven passes. Four separate operations – all of them carried out inside a tent – were needed here.

1. Root pass from inside
2. Hot pass and first filler pass from outside
3. Second and third filler pass from outside
4. Strip and final capping pass from outside

Small lots, short production times, high efficiency

MEDIUM-SIZED ENGINEERING FIRM STREAMLINES ITS JOINING OPERATIONS WITH A DIGITAL ROBOT WELDING SYSTEM

For utility-vehicle manufacturers Reform-Werke Bauer, welding low-alloy steels is an important factor.

What this Austrian engineering firm has found is that robot welding can make economic sense even for small lot sizes. To succeed in its relatively narrow market niche, it has to cater for clients' special wishes at the same time as ensuring business efficiency.



The welding process is executed automatically, even with small lots.

The technicians at Reform-Werke Bauer have been using the Fronius TransPuls Synergic 4000 system for robot welding since 2003. Among the results noted by the production managers are a one-third reduction in times, high process reliability and improved working conditions.

Improvements in the welding processes, in terms of quality and economy, have a distinct effect on the company's market position. A high level of vertical manufacturing integration with small lots, a wide spectrum of parts, many and varied tasks, and highly differentiated client wishes - this is the background to what Reform-Werke requires of its welding systems.

Firstly, these must be suitable for a wide-ranging spectrum of welding processes and materials / sheet thicknesses to be joined. Secondly, they should give a boost to quality and process reliability. And this Austrian client insists on ease of operation and cost effectiveness as a matter of course.

1000 different parts to weld

Low-alloy steel is the material used for the vehicle frames and the over 1000 other parts joined by the firm's 17 welding experts, who get through approx. 17,000 kg of weld filler metal a year. For Production Manager Manfred

Lebelhuber, welding is the key link in the process chain.

The welding technicians can easily create the program for the TransPuls Synergic 4000 on their own. The system for robot applications is suitable for a spectrum of processes ranging from MIG/MAG arc and pulsed-arc welding to TIG-DC welding and MIG brazing, in a welding current range of between 3 and 400 A. It weighs a mere 35 kg.

Dependable welding results, and greater job satisfaction

“We gain process reliability and 100 % reproducibility – and, incidentally, higher job satisfaction as well”, reckons Lebelhuber. He goes on to state a number of other advantages: “The TransPuls Synergic 4000 welds uniform, long seams on thick materials just as reliably as it does short ones on thin

sheets – with little or no spatter in either case. With regular updating, the system is good for the next 10 years.”

The production manager sums it up in terms of business efficiency: “The more complicated and the more extensive the part to be welded, the greater the efficiency gains. Our investment in the robot-welding system will have paid for itself within three years.” With the TransPuls Synergic 4000 system from Fronius, utility-vehicle manufacturers Reform-Werke Bauer found exactly the solution they were looking for.

[www](http://www.reform-werke.at)

Reform-Werke Bauer & Co. GmbH
www.reform-werke.at

Reform-Werke Bauer & Co. GmbH



The Austrian company Reform-Werke Bauer & Co. GmbH has been family-owned for three generations. Reform's customers include hill-farmers and foresters working steep hillside land, owners of particularly hilly parks, gardens or golf courses, as well as municipalities and highways departments. The core competence of this Wels, Austria based niche engineering firm is utility vehicles for special terrains and gradients, including such differentiated areas of use as sowing, mowing, harvesting or winter road clearance.



A “Metrac” nears completion: The platform concept is the basis for meeting specific client wishes at the same time as manufacturing economically.

The TransPuls Synergic 4000

Technical data

- Welding current range: 3 – 400 A
- Welding current at:
 - 10 min/25 °C, 100 % d.c. 365 A
 - 10 min/40 °C, 100 % d.c. 320 A
- Degree of protection IP 23
- Dimensions
 - LxWxH mm 625 x 290 x 475 mm
- Weight: 35.2 kg

Processes

- MIG/MAG arc welding
- MIG/MAG pulsed-arc welding
- MIG brazing
- TIG-DC welding
- Electrode welding

Renewable raw materials

HOW KLAUS FRONIUS VIEWS THE COMING END OF PETROLEUM AND NATURAL GAS

“Energy is getting scarce. Our most important natural resources are running out. What can be done?” These were the sort of headlines that were typical of the mid-1970's, remembers Klaus Fronius. Nowadays, the topic barely merits a mention. Even though the “end” is 30 years closer than it was then. weld+vision got talking with Klaus Fronius on the subject of energy, and is pleased to pass on some of his thinking on the matter.



Right from its earliest days, the Fronius company has always been involved with energy. Welding technology and battery charging systems, for instance, are both areas which are directly to do with electric power.

But Fronius went a step further: With photovoltaics, the company has moved on to converting and producing energy directly. Using resources that will never – indeed can never – run out. Like the sun, or even water – for fuel cells, for

example. Mere dabbling in an interesting sideline? “No. Not in the slightest. There is a pressing need to act. Around 30 or 40 years from now, or maybe in as many as 50 years' time, we shall have finished with petroleum and natural gas once and for all. And if you're in any doubt about that, just look at the behaviour of the really big players in this league”, says Klaus Fronius.

In 30 or 40 years' time, there will no longer be any money to be made from petroleum

To illustrate this assertion, Klaus Fronius points to two of his company's customers: One of them is CRC Evans in Canada, one of the world's biggest manufacturers of pipeline construction equipment – which has just changed over to welding-technology from Fronius. On a recent visit to Fronius, the Managing Director of CRC Evans – an Austrian – was talking to Klaus Fronius about the future of oil production. CRC Evans, for instance, is boosting capacity from 120,000 km of pipelines per annum to 200,000 km by 2011. The reason for this is that petroleum is having to be fetched from fields that are further and further away, and is increasingly contaminated. This means that the pipes need to be of smaller diameter in order for sufficient pressure to be built up to transport the petroleum along the pipeline. Nevertheless, this line of business does not have a long-term future – in 30 or 40 years it'll all be over, reckon the experts at CRC Evans.

Another example is Hyundai Shipyards in Ulsan, South Korea. At present, Hyundai produces one petroleum or natural gas supertanker every seven days. By 2010, they'll be up to one every day. Yet even at Hyundai, there's one thing they're sure of: We're "scraping the barrel", the end is in sight, and petroleum and natural gas will then be a thing of the past.

Higher demand from the Far East

"But for us Europeans, this period could turn out to be shorter still. And the reason is simple: Those who pay more for their oil will be able to get more of it", says Klaus Fronius. And who will be paying more? "China. China's wealth is of a completely different kind from Europe's. And China has only just entered the petroleum era – so it will not be in a hurry to leave it. China is not only able to afford this, it is determined to do so."

The renewable resource of the future: Knowledge

Has Klaus Fronius got a counter-recipe at the ready? Yes, he has. And it sounds very much like a classic Fronius success recipe: "There are certain things where we Europeans have got a definite edge. The biggest of these lies in our know-how and huge specialist knowledge in many different fields. It doesn't matter how many faked knock-offs keep coming onto the market from countries that are good at that sort of thing – the fact remains that our knowledge and our stored know-how cannot be copied. Ideas are not so easy to figure out."

"Another area where we can have an edge is speed: The faster we get to market with new products, the stronger our position will be." And Klaus Fronius continues: "How can we work best with this raw-material, knowledge? It's all

about coming up with ideas. Ideas as to how we can substitute renewable resources for crude oil, for instance.

The greatest opportunity for doing this is to be found in our young people. We need to make clear to them just how important education is, just how important their ideas are, and just how important their commitment and involvement are. If we can do that, then all the rest – in terms of practical implementation – will follow."

Klaus Fronius knows what he's talking about. An example would be the totally resource self-sufficient house built recently in the Netherlands, using solar energy and fuel cells. The second is currently being planned near Wels, in Austria. As an experiment aiming at an advanced residential power-supply concept.

www 

CRC Evans: www.crc-evans.com
Hyundai Shipyards: www.hhi.co.kr



*The Charles Bridge
and Prague Castle*

Prague: A different “take” on the Golden City beside the Moldau

*THE CULTURAL METROPOLIS OFF THE BEATEN TOURIST TRACK –
A SIDE PROGRAMME FOR THE INTERNATIONAL WELDING CONFERENCE*

Prague is a world heritage city. Prague is the sort of place that you simply have to have seen and enjoyed at least once in your life. And when you do, you really ought to spend more than just one day there. Maybe this July would be a good opportunity to visit Prague. Why? Because the Annual Assembly and Conference of the International Institute of Welding will be taking place there

from 10th to 15th July. weld+vision has been there to have a look-around for you in advance.

Prague, of course, is filled to the brim with “classic” sights. To begin with, there is Prague Castle, which dates back to 870 and symbolises the more than one-thousand-year history of the Bohemian nation; then there is the old

Royal Palace, the Charles Bridge and the Powder Tower, used today for exhibitions of mediaeval handicrafts, astrology and alchemy.

But you'll find more than enough about all these places in traditional travel guides. What you won't find so easily, though, are suggestions like the ones which Prague natives divulged to us:



Petrin Funicular



The "Dancing House"



View from the Petrin Hill

A different “take” on Prague: Sports cars, mirror labyrinth, sewerage systems ...

The Ecotechnical Museum is right at the very top of this list. There are some fascinating technical monuments and relics to look at here: Sewerage systems complete with their original machinery and equipment. Or the Technical Museum: This documents the technical development of the Czech lands, with a particular focus on public transport. The Sports-Car Museum is also very interesting, with an exhibition of over 50 models, both new and old. From Ferrari Testarossas to Škodas. Also well worth visiting is the Public Transport Museum, where urban “mass transit” vehicles - both antique and modern – can be admired.

While on the subject of public transport: You should definitely take a ride on the Petrin Funicular. It was built in 1891 to take visitors up the Petrin Hill to the lookout tower – a 60 m scaled-down replica of the Eiffel Tower. The mirror labyrinth is right nearby.

Architecture and technology

If you're interested in architecture, you should go and see the following buildings: The Cubist Villa on the Moldau Embankment, the Loos Villa, the Dancing House (also on the Moldau Embankment), and the Sazka aréna stadium. You ought also to see the Zizkov TV tower – but then, at 124 metres tall and weighing a massive 11,800 tonnes, this is impossible to overlook anyway, no matter where in the city you are. The lifts whisk you up to the restaurant and the viewing terrace (you can see 100 km on a clear day) at 4 metres per second.

Engineers will be particularly interested in the Danube House on Rohansky Island, the first energy-saving administration building anywhere in Central Europe. It was picked out as the “Best Future Office Building” at the 2004 International Property Market (MIPIM) expo in Cannes, France.

That was just a small selection of not-to-be-missed “alternative Prague sights”.

Prague at the centre of the world welding community

Prague will be hosting the International Institute of Welding Congress from 10th to 15th July. Speakers from all round the world will be there to present and discuss new technologies and welding processes. This international event is also being partnered by Fronius CZ. Fronius' has a substantial presence in the Czech Republic – a production location in Český Krumlov, and 6 sales teams in Prague, Pilsen, Hradec Králove, Jihlava, Ostrava and Zlín. In addition, this structure is strengthened by 11 distributorships.

www 

International Institute of Welding:
www.iiw-iis.org
 2005 International Welding Conference, Prague: www.iiw2005.cz
 Sights to see:
www.pragueiguide.com
 Accommodation: www.visitprague.cz
 Fronius Česká Republika:
www.fronius.cz (in Czech)

Austria **FRONIUS INTERNATIONAL GMBH** • Buxbaumstrasse 2 • A 4600 Wels •
Tel: +43 7242 241-0 • Fax: +43 7242 241-3940 • E-Mail: sales@fronius.com
VERTRIEB ÖSTERREICH • Tel: +43 7242 241-3100 • Fax: +43 7242 241-3490 • E-Mail: sales.austria@fronius.com

Brazil **FRONIUS DO BRASIL** • Av. Senador Vergueiro, 3260 • Vila Tereza • São Bernado do Campo- SP •
CEP: 09600-00 • Tel: +55 11 4368 3355 • Fax: +55 11 4177 3660 • E-Mail: sales.brazil@fronius.com

Czech Republic **FRONIUS ČESKÁ REPUBLIKA S.R.O.** • V Olšínách 1022/42 • CZ 100 00 Praha 10 •
Tel: +420 2 72 74 23 69 • Fax: +420 2 72 73 81 45 • E-Mail: sales.praha@fronius.com

France **FRONIUS FRANCE SARL** • 13 avenue Félix Louat-B.P. 195 • F 60306 Senlis Cedex •
Tel: +33 3 44 63 80 00 • Fax: +33 3 44 63 80 01 • E-Mail: sales.france@fronius.com

Germany **FRONIUS DEUTSCHLAND GMBH** • Liebigstrasse 15 • D 67661 Kaiserslautern •
Tel: +49 631 351 27-0 • Fax: +49 631 351 27-30 • E-Mail: sales.germany@fronius.com

Norway **FRONIUS NORGE AS** • Tegleverksvn., Aaserud Ind. område • N 3057 Solbergelva •
Tel: +47 32 23 20 80 • Fax: +47 32 23 20 81 • E-Mail: sales.norway@fronius.com

Slovakia **FRONIUS ČESKÁ REPUBLIKA S.R.O.** • Nitrianska 5 • SK 91701 Trnava •
Tel: +421 33 590 75 11 • Fax: +421 33 590 75 99 • E-Mail: sales.slovakia@fronius.com

Switzerland **FRONIUS SCHWEIZ AG** • Oberglatterstrasse 11 • CH 8153 Rümlang •
Tel: +41 44 817 99 44 • Fax: +41 44 817 99 55 • E-Mail: sales.switzerland@fronius.com

Ukraine **FRONIUS FACKEL GMBH** • S.Knjashitschi • Browarskogo R-NA • Kievskaya OBL.; 07455 •
Tel: +380 4494 627 68 • Fax: +380 4494 627 67 • E-Mail: sales.ukraine@fronius.com

USA **FRONIUS USA LLC** • Business Center-Eagle One • 10503 Citation Drive • Suite 600 Brighton •
Michigan 48116 USA • Tel: +1 810 220 4414 • Fax: +1 810 220 4424 • E-Mail: sales.usa@fronius.com

You can find the addresses of our international distribution partners at www.fronius.com/addresses

www.fronius.com



weld+vision

Subscription



CONCENTRATED INFORMATION.

With a free weld+vision subscription.

The "issues" that count! Issue by issue, the Fronius weld+vision magazine brings you information and behind-the-scenes reporting from the world of welding. Why not let your colleagues and friends benefit as well? Simply sign them up for a gift subscription to weld+vision.

weld+vision is opinion-forming.

The editorial team of the Fronius magazine would dearly love to know: What do you really think of weld+vision? Send us your reactions, suggestions, praise, criticism ...
... we await them with great interest!



■ Please also send weld+vision to the following address from now on, free of charge.

(Of course, you can also pass on this reply card – or copies of it – directly to anybody who's interested. If you prefer, you can also fax it back to us, on +43 7242 241-2670).

My opinion on weld+vision
(or e-mail to weld.vision@fronius.com)

Company
Forename
Surname
Department
Street address
Postcode & locality
Country
e-mail

--

Please affix
postage stamp if
available, or fax to
+43 7242 241-2670

Fronius International GmbH
Marketing & Kommunikation
Günter Fronius Strasse 1
A 4600 Wels

