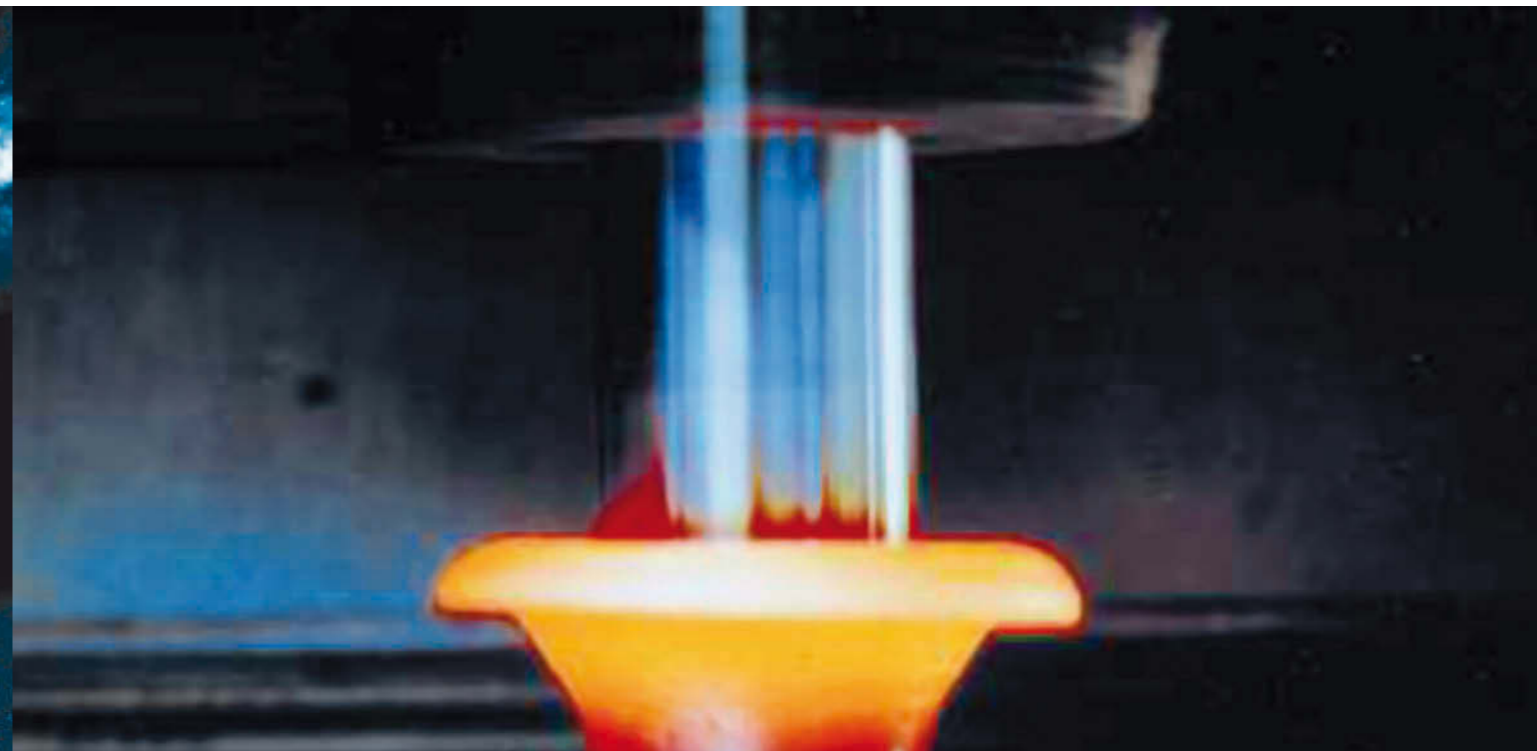


TRUST BUILDS BONDS



Butt-welded chain link



Friction welding

HARMS+WENDE **HWH**



Expertise, innovation and uncompromising focus on solutions: these are the components that distinguish Harms+Wende. Our mission is to develop and implement top-quality processes for resistance and friction welding – a goal we have been reaching with our customers and partners for over 60 years. We keep the quality of the products welded using our systems in view at all times: this is our impetus, our motivation for implementing new ideas. Commitment to innovation is a tradition for us.

Service- and customer-oriented work is our credo. We are bound to this philosophy and put our customers first. Open, honest and friendly customer relations go without saying for us. Harms+Wende repeatedly review this guiding theme through customer satisfaction analyses. Distinctions as a customer champion confirm our success.

BECAUSE 'TRUST BUILDS BONDS'

Harms+Wende repeatedly review this guiding theme through customer satisfaction analyses. Distinctions as a customer champion confirm our success.



'OUR GOAL: A CONTROLLED WELDING PROCESS!'

CONSISTENT FOCUS ON THE PROCESS!



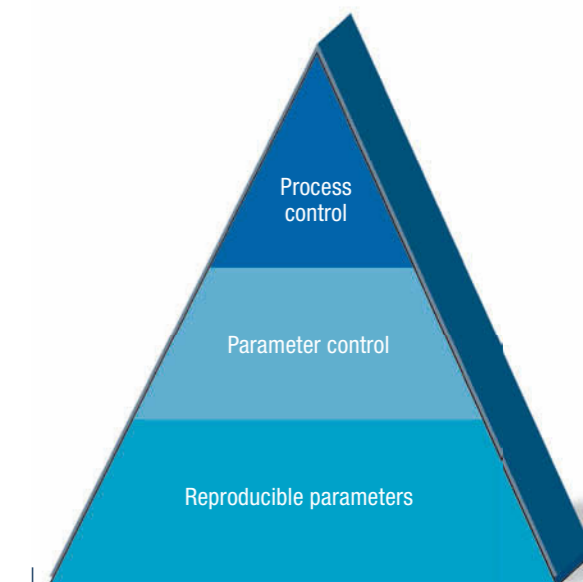
Harms+Wende's system portfolio, technologies and experience encompass resistance welding and friction welding.

We are setting the standard for innovative techniques, whether as pioneers in medium frequency, front-runners in adaptive controls and in-line monitoring systems or trendsetters in highly innovative friction and friction spot welding systems. The focus of all HWH development activities is the economic and technological optimisation of the welding process. Conservation of resources and the environment are always taken into account. The environmental prize for our System GeniusMFI and the distinction as an ecologically profitable company are impressive proof of the energy efficiency and environmental friendliness of both the resistance and friction welding technologies and the company's production.



PROCESS RELIABILITY

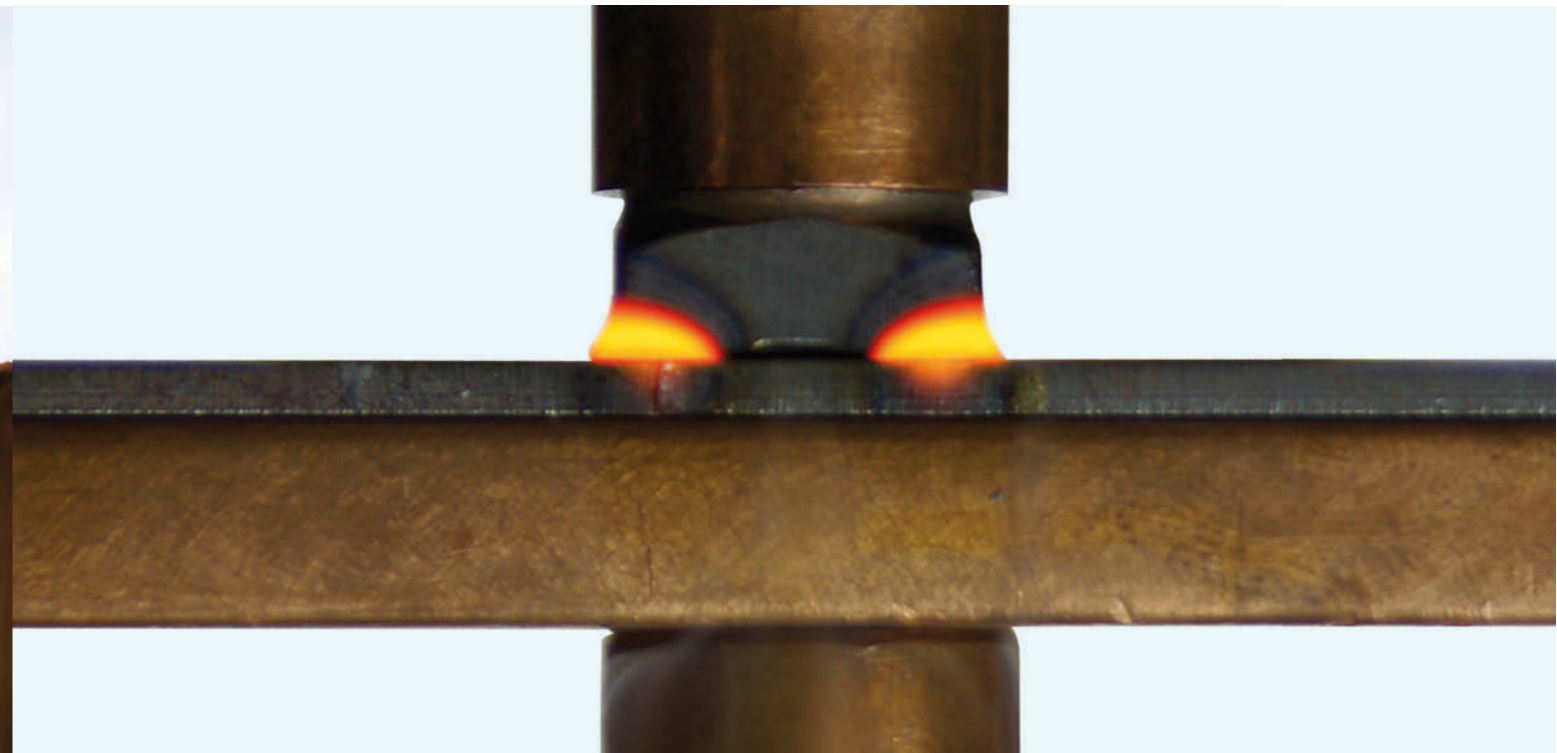
Reproducible parameters make every welding process reliable because what can be reproduced can also be controlled and monitored. The Harms+Wende model of the process pyramid reliably leads to a controlled welding process and hence to a stable and economical joining operation.



Process and parameter pyramid



Wagon building, spot welding

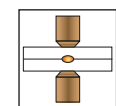


Projection welding

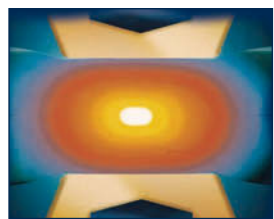
RESISTANCE WELDING

As specialists in resistance welding Harms+Wende have been offering controls and monitoring systems for all process variants for more than 60 years. With control systems for spot, projection, butt, flash butt, mesh and seam welding, our portfolio offers the right system for any application.

State-of-the-art control technology based on 50Hz, medium-frequency and high-frequency inverters forms the basis for high-performance welding systems. The spectrum ranges from single station applications to fully integrated lines and the scope of supply ranges from individual components to complete booth systems.

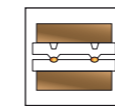


SPOT WELDING



Economical, powerful and robust: this characterises the dominating variant of resistance welding in a few words. That's why it has been the undisputed champion in many branches of industry for years. Completely linked body in white lines for resistance spot welding mark the current peak of development. Adaptive controls such as IQR and real process control through powerful monitoring and testing systems such as PQS enable reliable welding of the most com-

plex of materials. This allows high- and ultra-high-strength steel grades to be joined reproducibly and economically. Through development of the IQR adaptive control system Harms+Wende have set the standard and enabled top-quality welding. These developments have made spot welding more important today than ever before. The product range at Harms+Wende is enormous. From controls for all types of spot welding machines to linked regulating controls for the most demanding of requirements, the solution you need can be found at Harms+Wende.



PROJECTION WELDING



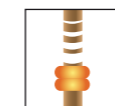
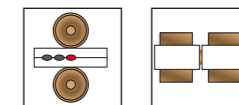
Projection welding is a very capable resistance welding variant. It offers advantages in terms of automation because multiple points can be welded in a single pass. The high currents required are a speciality of Harms+Wende.

The current of several hundred kA produced by the inverter technology is a pioneering achievement of the Harms+Wende development team. This can also be said of the monitoring of projection welds by specially developed monitoring functions.

SEAM / BUTT AND FLASH BUTT WELDING



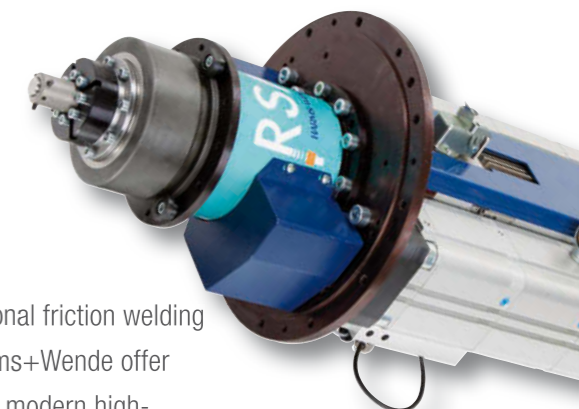
These technical specialties are firmly established in certain niches. Harms+Wende provide the corresponding controls meeting the requirements of the welding processes.



FRICTION WELDING

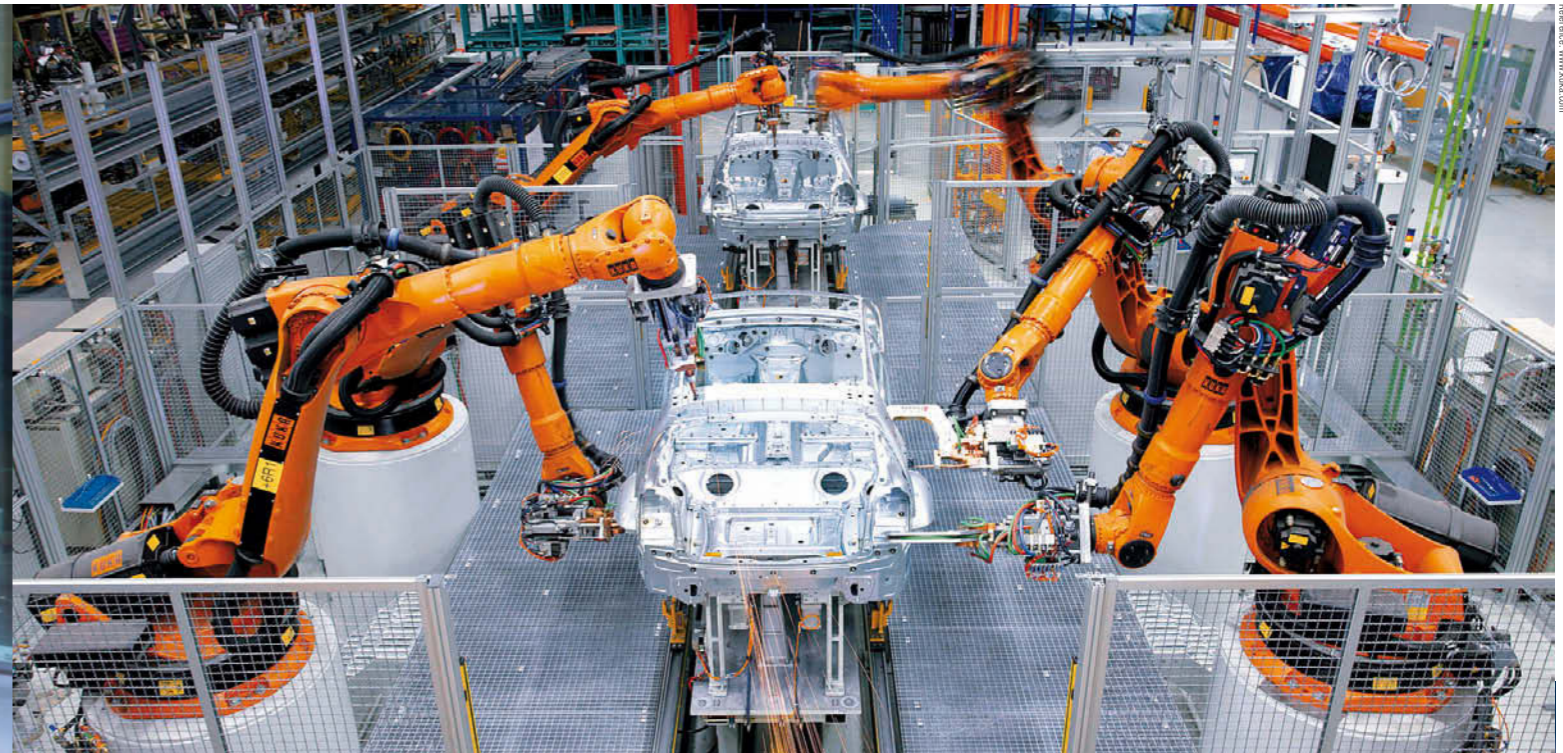
The second business segment after resistance welding is friction welding. This newly interpreted 'old' joining technology is undergoing rapid development and offers new perspectives in joining technology due to its high process reliability and diversity of applica-

tions. As specialists for rotational friction welding and friction spot welding Harms+Wende offer innovative joining systems for modern high-performance materials.





Auto body, between 4000 and 6000 points



Spot welding the body in white

Photo: www.hwa.com

AUTOMOTIVE

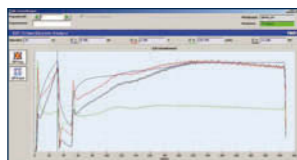
IQR Lower power consumption and high demands on safety equipment in automobile manufacture necessitate the use of state-of-the-art materials. The welding technology must exhibit maximum process reliability and flexibility whilst the production process demands user-friendly and robust solutions.

These amazing acrobatic splits place extremely high demands on the product. Harms+Wende provide integrated product lines tailor-made to these requirements.



THE DRIVING FORCE

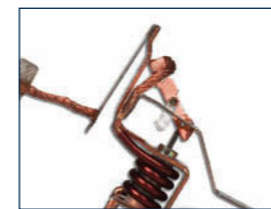
State-of-the-art medium-frequency and 50Hz welding current sources form the basis. Harms+Wende provide an integrated system with standard functions such as constant current regulation, electrode management and monitoring functions. Thanks to the IQR adaptive control system the welding lens is monitored during its formation and the welding process is regulated online by means of current and voltage measurement. Different material combinations become controllable and



interference factors are eliminated directly. When manual welding tongs are employed a welding program can be used; in automated and robotic welding systems process fluctuations are compensated for. The inspectors monitor the process during each individual weld. Operation via XPegasus enables visualisation, part tracking and data archiving.

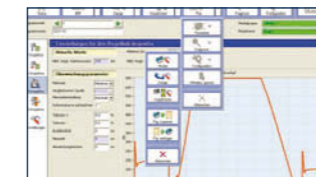


MICRO WELDING



The world of small part welding has special requirements. The welding process is extremely fast. A wide range of materials are used. Iron and non-ferrous materials are welded. This places special demands on the welding systems. Harms+Wende offer tailor-made solutions based on 1kHz and 10kHz systems which can meet

the requirements of short-duration welding. These systems can be seamlessly integrated into existing machine concepts. The advantages to you are the fast machines and high outputs made possible through integration of operation and control.

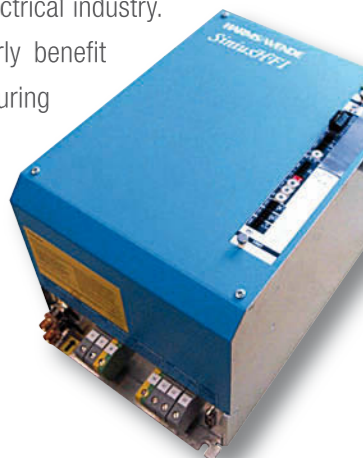


INDUSTRIAL SOLUTIONS



Extreme diversity requires extremely flexible solutions. For every welding task Harms+Wende design the right control. Be they specially coordinated modules for machinery construction or maximum power for projection welding, our controls and power units cover all resistance welding techniques. The particular challenges here are the obvious weld quality and systems which are both economical and efficient. These challenges are met with the easy and intuitive operation and the outstanding possibilities for integration into new and

existing systems through the interfaces to PLCs. Harms+Wende are your partners for the entire electrical industry. Many of our users can particularly benefit from our experience in manufacturing complete switchgear systems according to in-house or customer specifications.

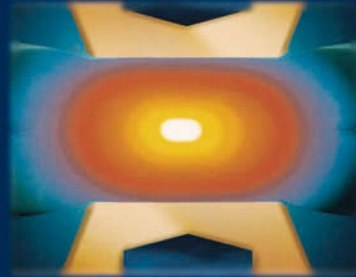


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