

HAAANE

welding systems

WELDING AUTOMATION – INNOVATIVE & CUSTOMIZED SOLUTIONS

PIPE
WELDING

WELDING AUTOMATION

FOR PIPES & PIPELAYING
EQUIPMENT & COMPLETE
PRODUCTION LINES



HAAANE
welding systems

WELDING AUTOMATION – INNOVATIVE & CUSTOMIZED SOLUTIONS

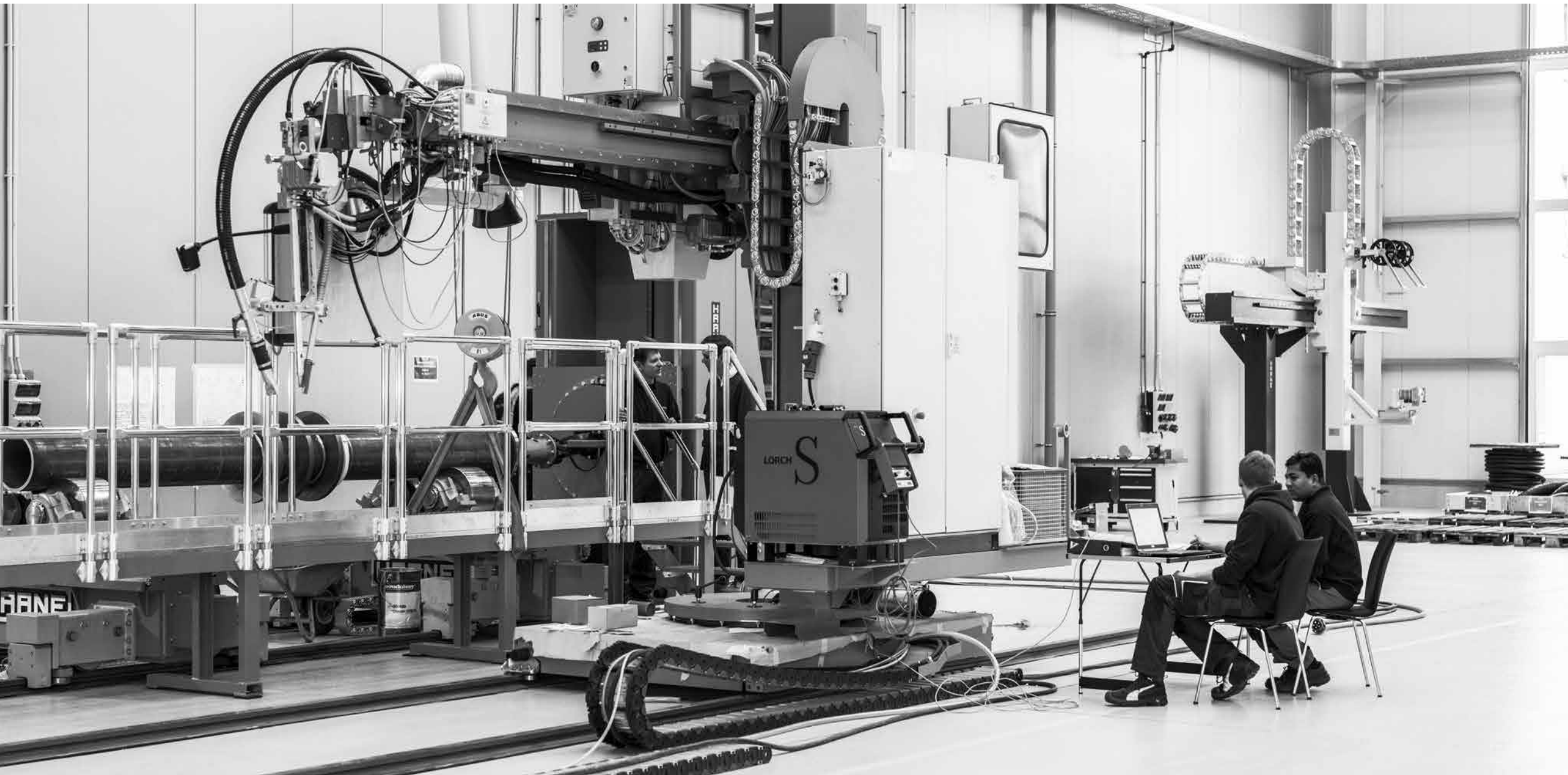
PIPE
WELDING

OUR PORTFOLIO OF INNOVATIVE PROJECTS

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HIGH PRODUCTIVITY SOLUTIONS

HAANE welding systems is a company active in mechanical engineering for the welding industry with many years of experience; but nevertheless a young and very flexible team of engineers, welding specialists, and a professional production workforce.

Our products? Solutions! We handle different kinds of welding processes, special cutting applications, and a very wide range of work piece handling systems.

We do not only ensure high deposit rates, but also seek to minimize the non-arc-time which quite often accounts for more than half of the welding time.

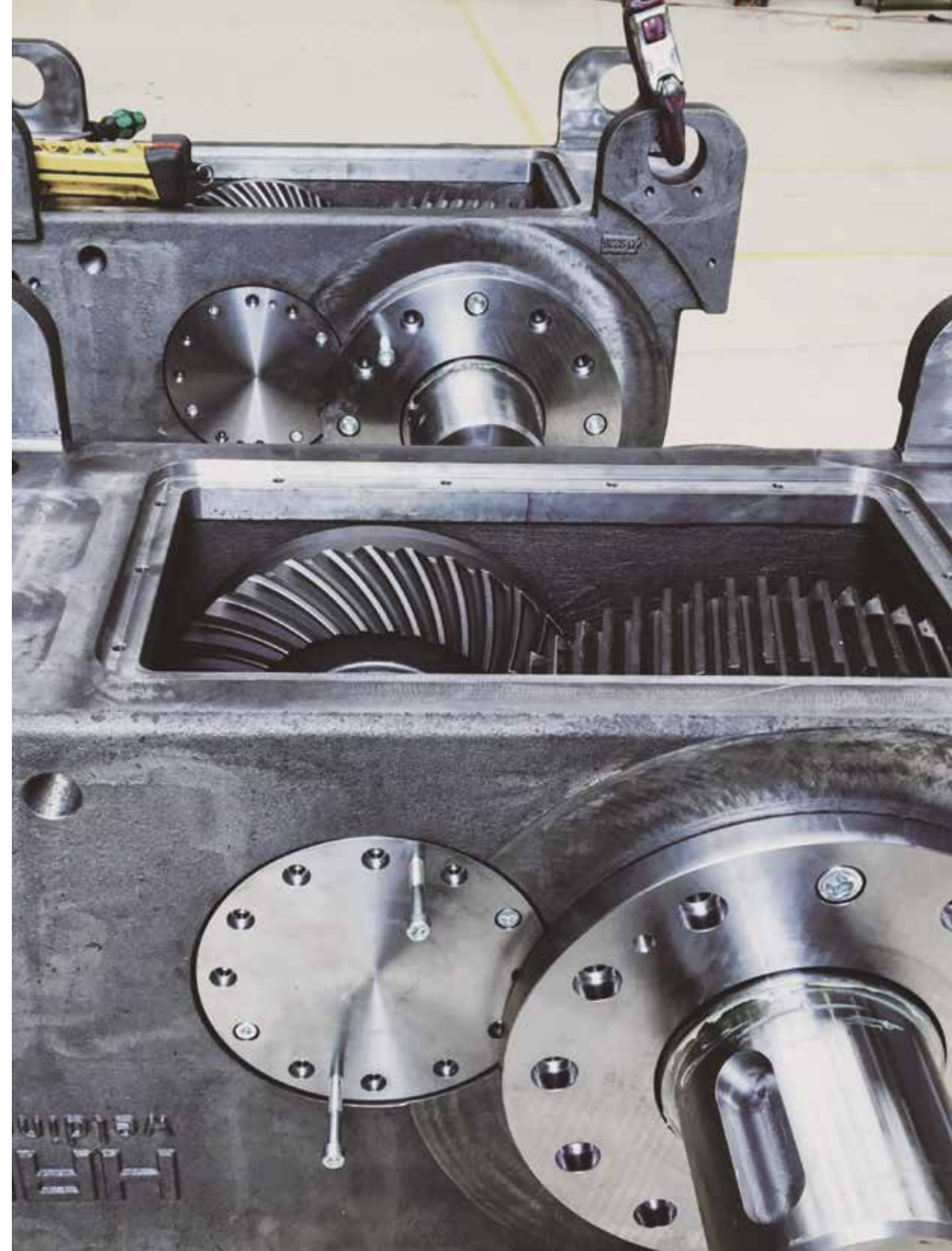
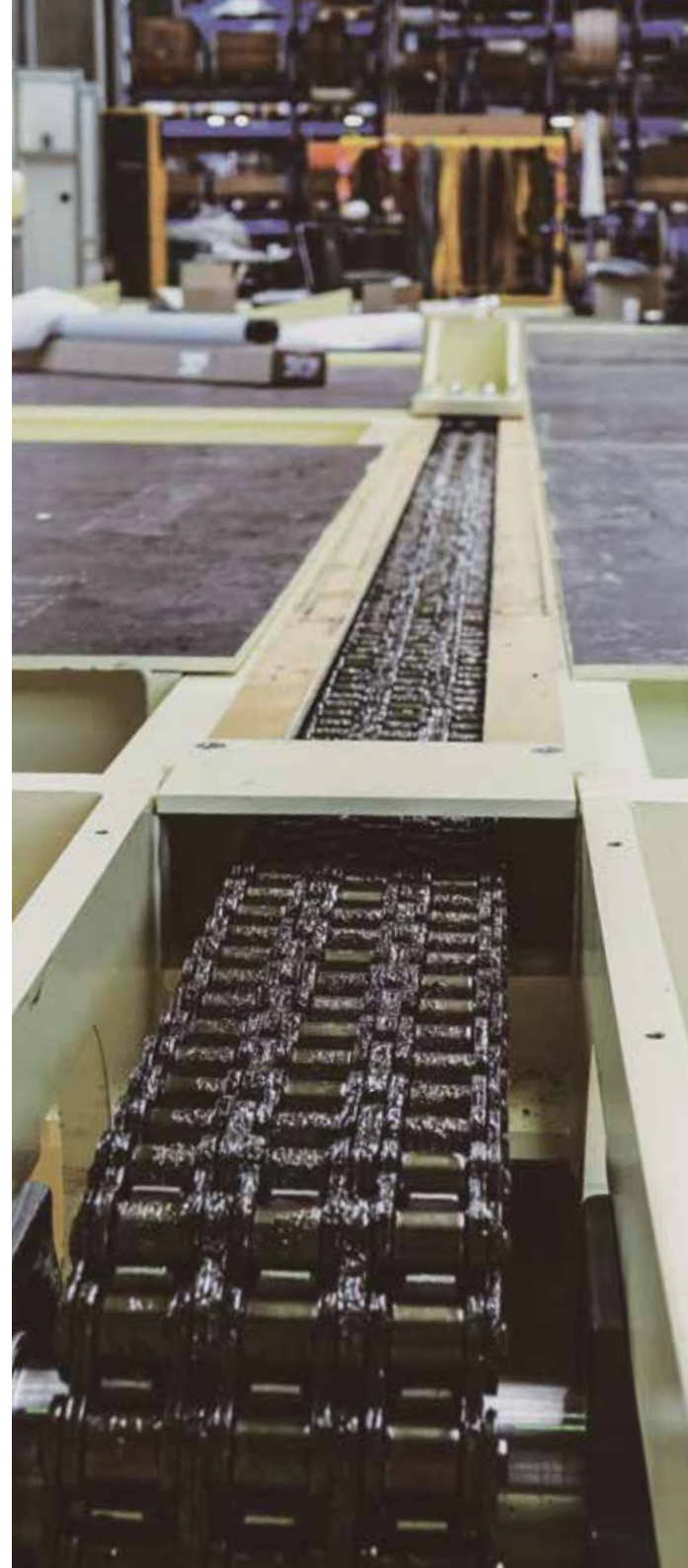
Thanks to our own in-house facilities, 3D-designing (SolidWorks) and manufacturing, we are able to grasp customized solutions very quickly.

Being future-oriented and open to new challenges, we will identify the best way how to contribute to the success of your projects. We deliver consultant studies, equipment, and turn-key units.

Our assembly, start-up, and after-sales crew (with a great deal of international experience) operates worldwide. They do their job on land, on water, even in the air if necessary.

This brochure offers you a journey through the exciting industry we work in, to discover our core values and our contribution to the advancement of welding technology.

OUR MENTALITY? FINDING SOLUTIONS!



What happens if transport costs, for the coils and produced pipes, and local taxes jeopardize the profitability for a spiral mill? **Why not go for a mobile spiral mill? Please read page 19.**

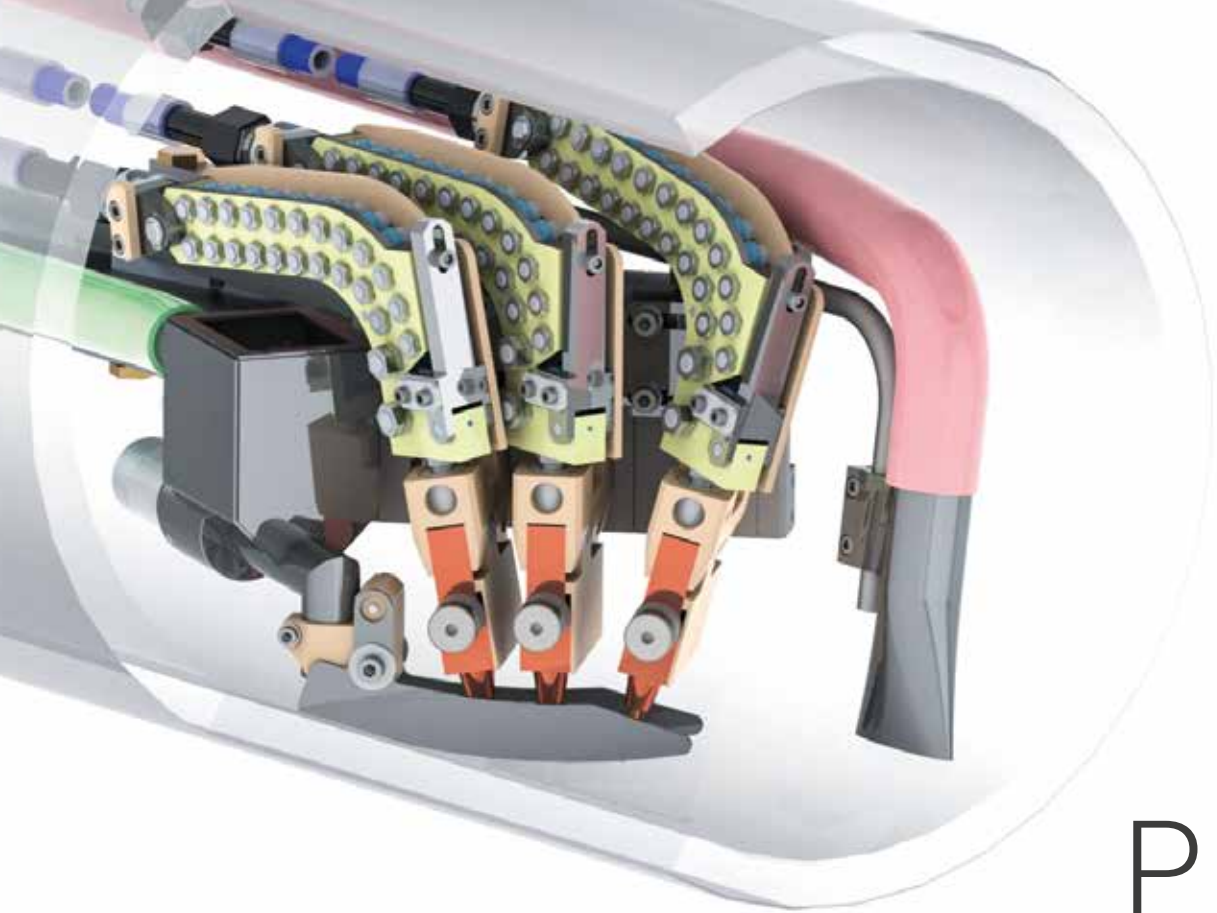
What happens if the defect and re-work rate of the pipework in pipeline construction drives the costs upwards and the production progress downwards? **Why not weld virtually defect-free seams fully automated? Please read page 40.**

What if you want to buy a welding machine and leave it at 80% functionality, because you rightly believe the other 20% will drive up the costs disproportionately. On the other hand you only see your safe return of investment in the remaining 20%, by lowering the idle times, increasing the arc time, error reduction and optimization of the operating system? **Why not consider a highly automated solution? Please read page 44/48.**

What if you often have large, narrow components, which are very dangerous to handle with the overhead crane? **Why not use a safe handling machine? Please read page 46.**

What happens if you have to carry out important welds on highly sensitive components in the distance, but on site, there is not enough qualified welding personnel? **Why not weld automated and bring along the equipment ready for use? Please read page 50.**

What if authorities, inspection organizations, or end users require a comprehensive, complete process data documentation for each of the welded pipes, or you yourself want that for product liability reasons? **Why not use the Pipe Track & Trace System? Please read page 58.**



PIPE MILL SOLUTIONS

» We don't do things half «

Which means we provide turnkey solutions for helical on- / offline pipe mills and for longitudinal pipe mills.

- » PIPE JOINT PREPARATION
- » PIPE WELDING
- » PIPE HANDLING
- » PIPE TESTING



HAANE welding systems provides components as well as turnkey solutions for longitudinal pipe mills and for helical on-/ offline pipe mills.

- » Our tack welding head is a success story:
Welding speed in ongoing operations of 10m/min up to 15 m/min
Minimum pipe diameter >10"
- » SAW multi-wire welding heads for inside and outside welding with high deposition rates. Easy adjustable, highly loadable torches as well as cassette solutions
- » Flux feeding and recovery systems
- » Advanced Welding Process Controllers
- » Data Documentation System
- » Pipe Track & Trace System



PIPE MILL DETAILS

For SAW multi-wire welding with inside and outside welding heads, detailed solutions are available which allow high deposition rates.

Solutions for small pipe diameters also exist for 90° guide pulley as well as contact jaws with a lifetime of up to one week in a 3-shift operation, implemented successfully by the engineering experience in this field.

As so often, it is the small details which are the key to success.

Together with our customers, we have therefore developed solutions around the handling of the welding head approved for applications under great operation stress.

Optionally using an intelligent cassette system, any adjustment of the torches is coupled with a safe flux provision of flux to every wire.

Furthermore, the maintenance time is greatly reduced by the user friendly equipment.



2-STEP PRODUCTION PROCESS: **FORMING AND TACK WELDING**

The tack welding head is a success story:

- » **Welding speed in ongoing operations of 10m/min up to 15 m/min**
- » **Minimum pipe diameter >14"**

Due to a specially designed wire-feed system in combination with a "proven-in-use" gas protection the weld spatters are considerably reduced and less stops will be necessary for cleaning during operation, especially in a flying cross joint machine.

Furthermore, all these systems are completed by a laser tracking system inside or outside for an automatic welding head guidance.

01.1 SAWH-PIPES (HELICAL PIPES), ONLINE & OFFLINE



AN INTELLIGENT FLUX FEEDING AND RECOVERY SYSTEM

The flux recycling admixing rate has to be controlled and complied with the requirements of the API and oil company regulations.

For this purpose, **HAANE** welding systems has developed a flux recovery system, which fulfils these requirements. Some of the special features are:

- » Due to a controlled temperature level of $>100\text{ }^{\circ}\text{C}$ the flux is safe during operation
- » Providing pre-heated and insulated tanks
- » Including heated flux funnels

The systems are typically equipped with magnet separators. The design follows a soft and smooth flux transport which reduces the stress for the components and also for the flux itself.

We only use first class components for the operation stations from carefully selected and well-known suppliers, e.g. FESTO, SIEMENS, who ensure fast and future availability and a high value stability.





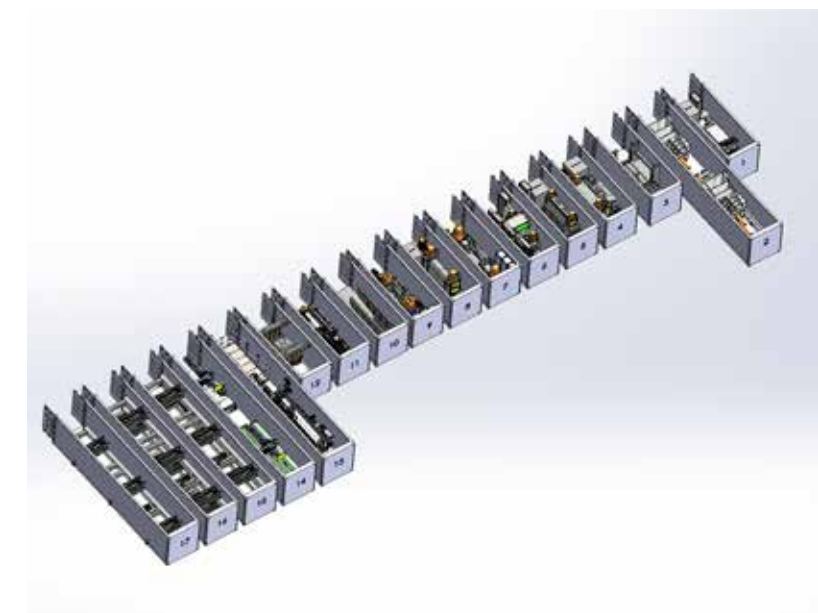
MOBILE PIPE MILL

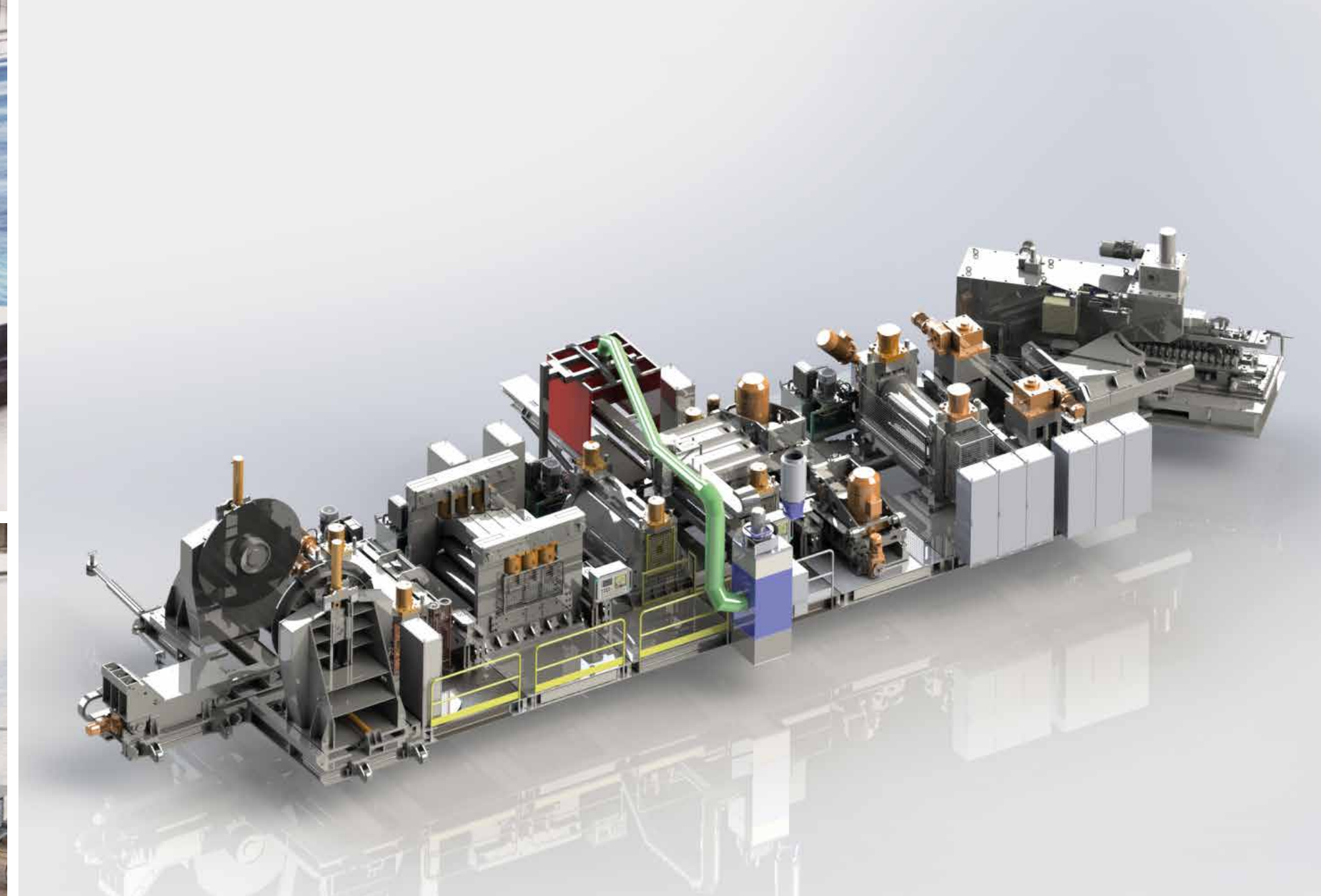
When running a spiral pipe mill, the base material, the steel coils, may come from remote places somewhere in the world and the usage of mills product, the pipe, may be at another remote place in the world.

This means a lot of transportation costs, transport damages, and taxes. Promotion of local economies may also be an obstacle, which needs to be overcome.

HAANE welding systems offers a solution: A Mobile Pipe Mill. The pipe mill has been divided into modules, modules on independent racks with independent hydraulic units and electrical cabinets. They can be packed into standard containers with CSC-approval and be shipped to their final destination, where the pipes or hollow structures are needed. The mobile Pipe Mill can easily be erect and dismantled.

Such a Mobile Pipe Mill is designed for a typical capacity of 50.000 – 60.000 tons per year, steel grades up to X80 and pipe lengths up to 50 m.





SPIRAL MILL COMPONENTS

Besides the entire mobile spiral mill and the welding equipment,
HAANE welding systems also can deliver single components, modules:

1. Coilcar & decoiler
2. Auxiliary drive with side guidancel
3. Leveller
4. Clamping device with side guidance
5. Butt welding station (Cross-welder) Plasma cutter for edge preparation
6. Edge Milling station
7. Main Pinch-roll (Main Drive)
8. Edge prepending device with side guidance
9. Forming station
10. Welding column with UT-station
11. "Flying saw"





WELDING OF SAWL-PIPES (LINE PIPES)

Whenever a steel pipe is produced from plate by roll bending or other forming processes, joining of the edges is required. The Submerged Arc Welding Process (SAW) is very well suited for this job.

HAANE welding systems supplies components as well as complete production lines for longitudinal welding of pipe, inside and outside, using SAW-Single-Wire, -Tandem, -TandemTwin, or -Multiwire Process.



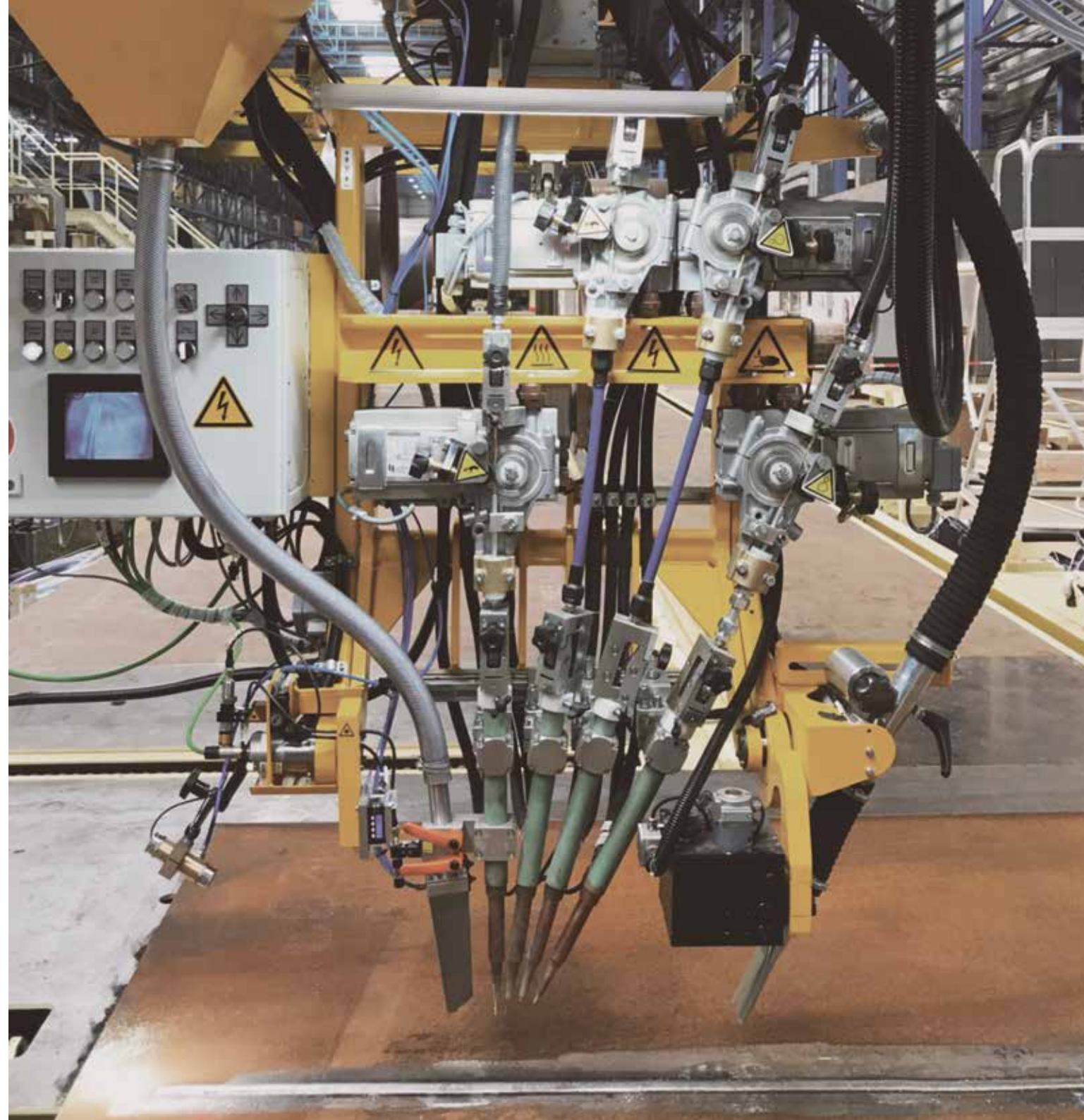
Our scope of supply for SAWL-Pipe-Production:

- » Powerful and robust SAW-welding heads
- » Power sources, thyristor, or inverter based with power booster, AC/DC-functionality, phase shift possibility, and others more
- » PLC welding controller
- » Seam tracker and television
- » Flux handling systems
- » Preheating device including temperature control & documentation
- » Inside booms up to 24 m of length
- » Pipe carriages/wagons
- » Complete pipe transport systems saving overhead crane capacity

If clad or lined steel line pipes shall be produced, **HAANE** welding systems can supply inside cladding systems for pipes from 8" upwards in order to seal the corrosion resistance surface.

The Multiwire SAW process is used on higher wall thicknesses and mostly in combination with narrow grooves as joint preparation. This is a challenging combination. To reach a save penetration as well as good slag detachment, **HAANE** welding systems pays special attention to:

- » Rigid torches and torch holders
- » Easy ways to get the wires in accurate line and angle
- » Wire straightening
- » Motorized tilting mechanism for the weld head in order to receive good slag detachment and avoid short circuit of the torch against the wall
- » Joint tracker for height and side
- » Fully automatic wire cutting with no bend of the sticking out wire





DJ-STATIONS (DOUBLE-JOINT)

Pipe-to-Pipe welding on site is time and cost consuming.

Therefore, it is always a good idea to deliver pipes with maximum possible length on site, limited by handling or transportation reasons.

If the standard pipe manufacturing process in the pipe mill results in a shorter than desired pipe lengths a double-joint station can be used in order to increase the pipe lengths.

Double-joint stations are used to do pipe-to-pipe welding under time and cost efficient conditions. Such stations can be placed in the pipe mill itself, even on a barge, or , in a camp near to the pipe laying site.

HAANE welding systems delivers DJ-stations comprising:

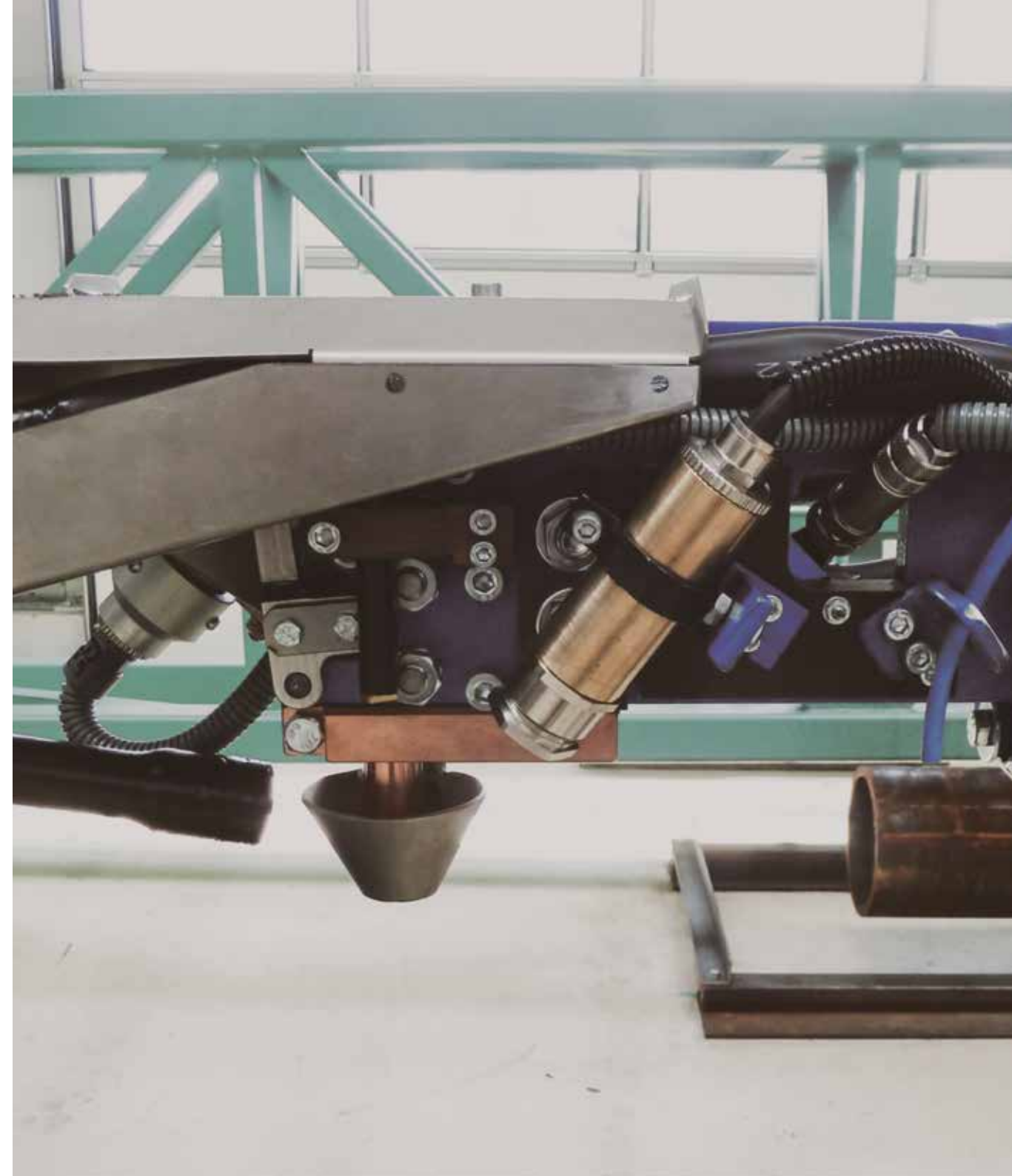
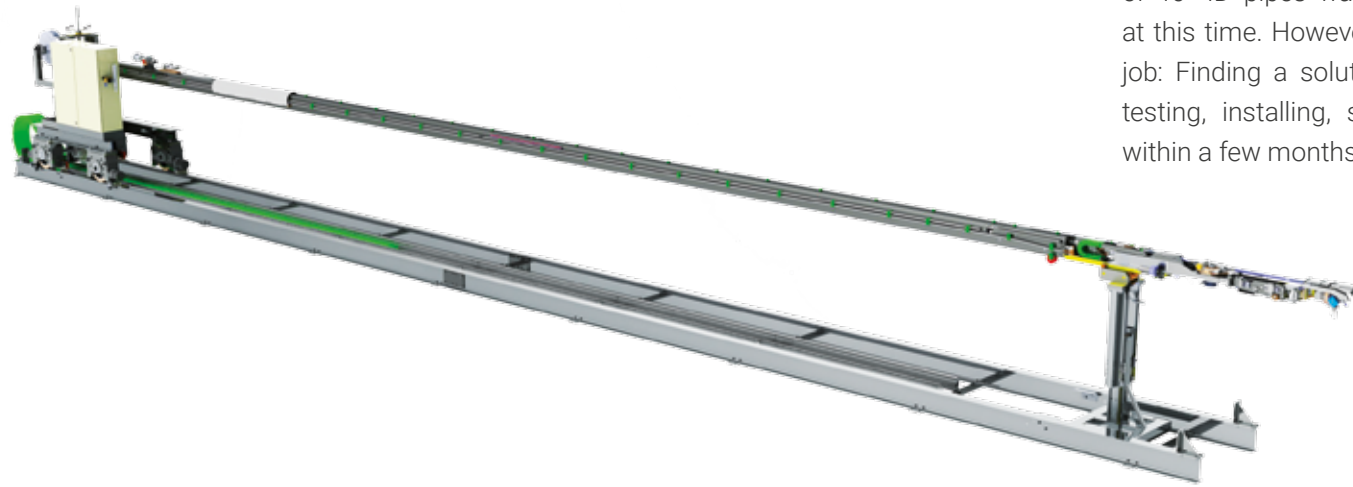
- » Joint bevelling equipment
- » Pipe transportation system
- » Line-up clamps
- » Fit-up rollerbeds
- » Preheating equipment
- » Circular welding stations for outside and inside welding

If clad or lined steel pipes shall be produced, **HAANE** welding system can supply circular inside cladding systems for pipes from 12" onwards in order to seal the corrosion resistance surface.

CHALLENGING OFFSHORE PROJECT

HAANE welding systems also delivered a welding station, suitable for joining two pipes each 12,200 mm in length, welding inside and outside. The double-pipe of 24,400 mm length thus created was fed into the fire line of a pipe-laying vessel installing offshore subsea pipelines.

But there was one tricky point: Circular internal welding of 10" ID pipes was not yet state-of-the-art technology at this time. However, **HAANE** welding systems took this job: Finding a solution including design, manufacturing, testing, installing, start-up, and production supervision within a few months. And we did it with success.





Additionally, we also took care of non-arc times, because time is money, valid especially for jobs on a very expensive vessel.

Some technical features:

- » Pipe length 12,200 mm each
- » Pipe diameter 10" ID up to 48"
- » Circumferential inside and outside welding
- » Inside welding with SAW single wire technology
- » Outside welding with SAW tandem technology DC/AC
- » Welding head positioning speed: 40,000 mm/min
- » Laser tracking system
- » Equipped with Siemens PLC-System and **HAANE** welding systems controller
- » Remote-Service-Facility via satellite

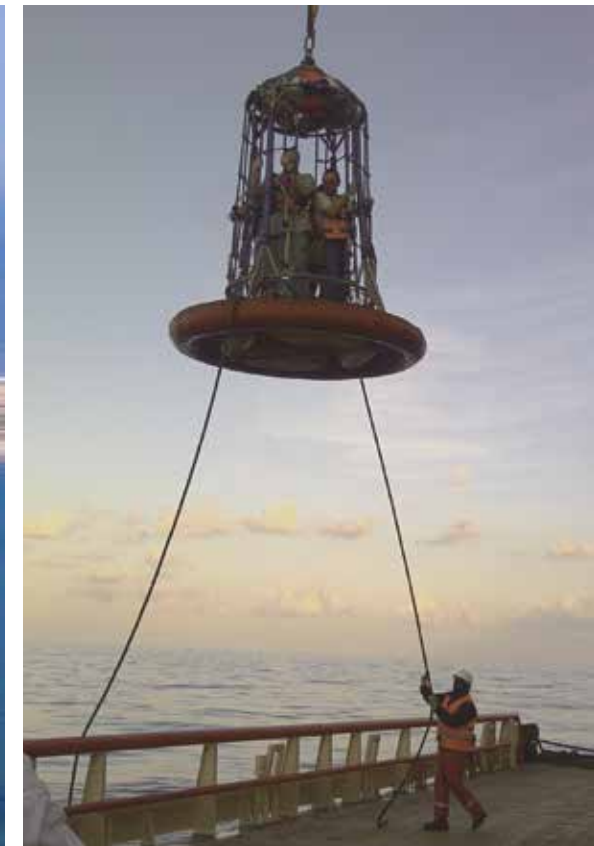


A SUCCESSFUL STORY »

AFTER SALES SERVICE – WORLDWIDE RELY ON US!

Of course, there was also a need for assembly, start-up, and after sales service on the vessel. But that was no problem for the highly motivated and experienced **HAANE** welding systems team.

All trainings needed such as the Norwegian Offshore Survival Training (OLF), Netherlands Emergency Response Training (NOGEPA), Helicopter Underwater Escape Training (HUET) as well as Emergency Breathing System training were carried out in order to acquire the necessary professional offshore licenses.



PIPELINE WELDING STATION INSTALLED ON THE WAY FROM ISRAEL TO BRAZIL.

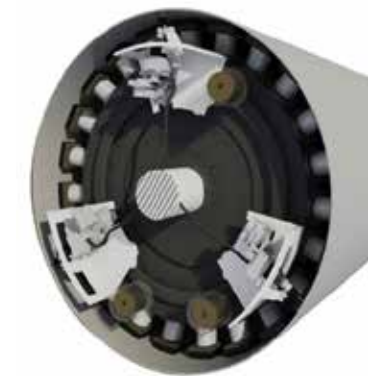
Pipe laying vessels hurry from job to job somewhere in the world. It was our challenging task to install our complete welding equipment ready for use between two of those jobs during the crossing from Israel to Brazil – and only 4 weeks were left for this ambitious target...

Finally, everything went according to plan and the job was successfully finished on time.



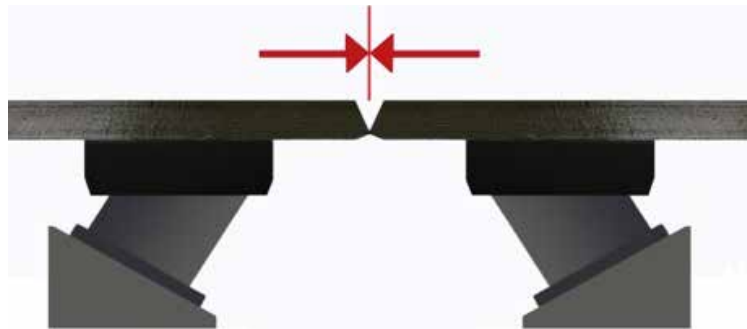
NEW GENERATION OF INTERNAL WELDER

FOR ON- & OFFSHORE PIPE LAYING WITH
PATENTED DUAL WELDING TECHNOLOGY



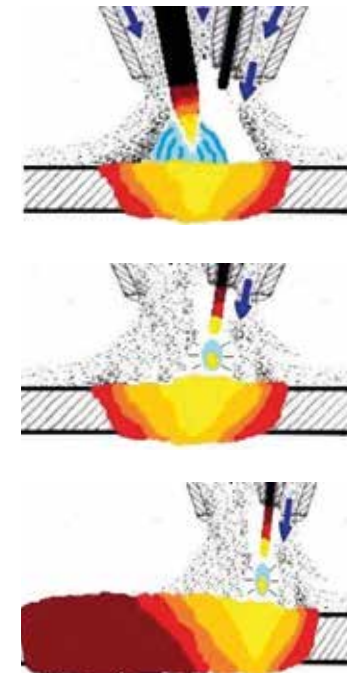
When pipe laying the pipe-to-pipe welding shall happen at a highly efficient sequence and the welds produced must be high quality welds with no defects.

For this purpose, **HAANE** welding systems has developed in close partnership with MAGNATECH Group B.V., The Netherlands, a new generation of fully automatic, electric operated internal welder. The electro-mechanical clamping system with tremendous clamping force increases roundness of pipe ends and provides a precise line-up.

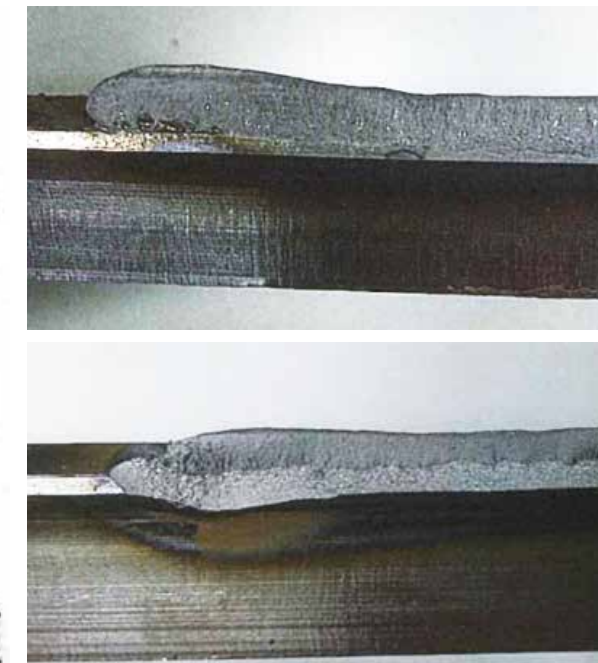


The angle clamping pistons are pushing pipe-ends towards each other providing closed joint fit-up. The laser aided weld path system provides exact coordinates to the independently controlled robotic welding heads for GMAW-orbital welding with several welding heads. Magnatech is taking care of worldwide sales & service of and for the Internal Welder.

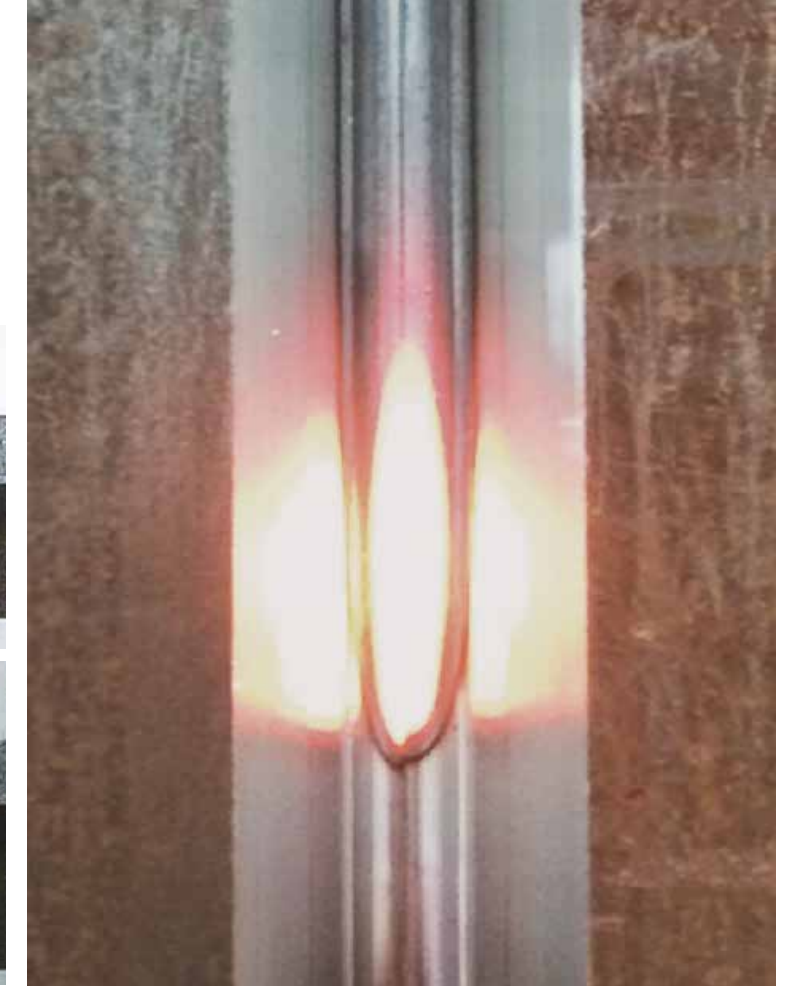
Welding of a defect free root is one of the most critical issues at a pipe laying job. The very well-known defects at the start position resulting from insufficient penetration and lack of fusion are resolved by the new patented welding technology.



Basic principle of patented Dual Welding Technology



Penetration with and without use of patented Dual Welding Technology



MAGNATECH and **HAANE** welding systems are proud to introduce its internal welder with innovative patented welding technology.

The innovative welding heads with automatic lead/lag angle adjustment, cross movement and height control, start with GTAW and create a fully penetrating melting puddle. In a split second after, the system switches to GMAW and starts in the fluid puddle, generating fully fused starts.

LONG SEAM WELDING OUTSIDE & INSIDE



Fabrication of offshore structures. Due to the destructive force of the ocean, offshore structures are mostly of enormous size.

Stiff pillars with large diameters and big wall thicknesses need to be manufactured by using extra high strength steel. Of course also the welding must be of best quality and at the same time quick and cost efficient.

When it comes to long seam welding the key to success is taking away idle times and increase the duty cycle, the arc time, by implementing automation to a maximum limit.



HAANE welding systems delivers extra big size welding platforms, safe and ergonomic, best workmanship following the EN-regulations, CE-certificated

- » Easy access
- » Wire feeding by big size drums or coils, including endless feed ability options
- » Never stopping flux feeding systems
- » Slag disposal systems
- » Automatic joint tracking
- » Welding data management, WPS data is sent from remote welding office to each single machines, real data goes back for follow up and store at quality management.
- » One operator running several welding stations

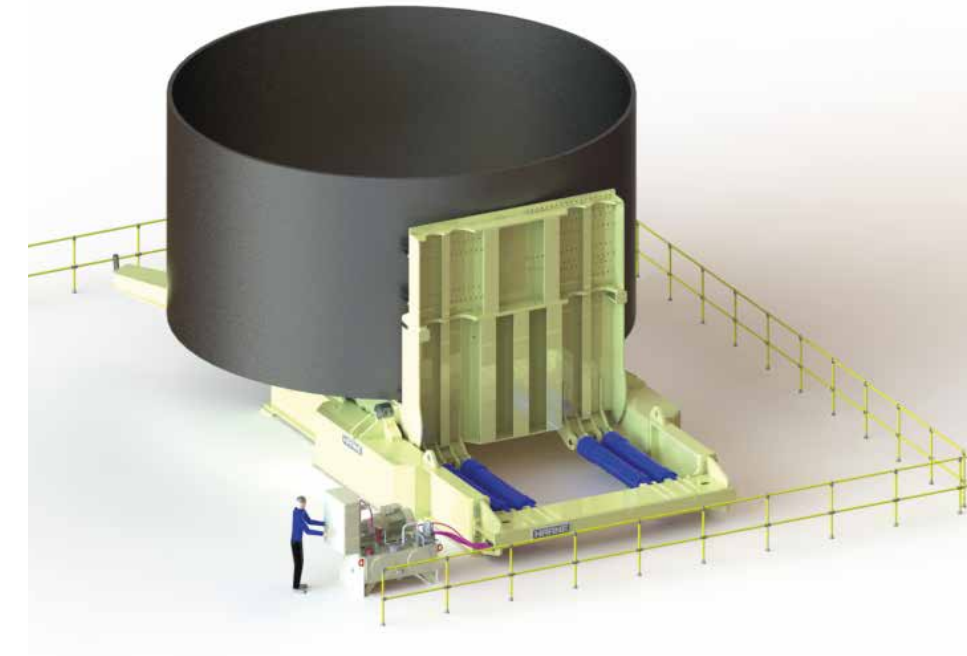
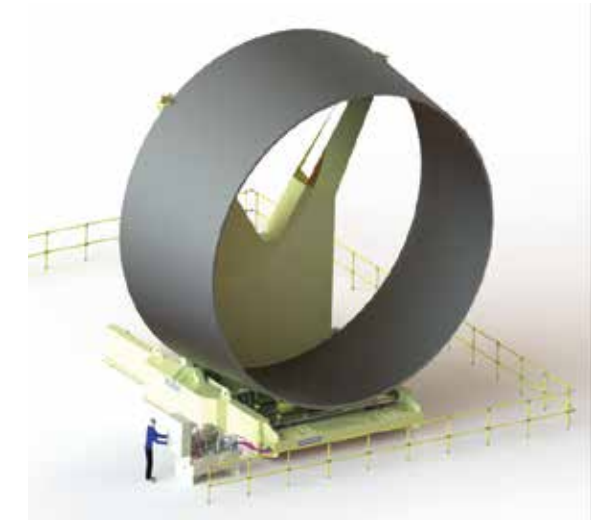


SAFE HANDLING OF HUGE COMPONENTS

In the fabrication of offshore structures (DNV GL – OS C 401), e.g. monopiles, the requested diameter of the components is increasing steadily. This ends up in slim and huge components, where we find the diameter to be several times more than the width.

The handling of such components in the factory is quite dangerous, especially when they need to be flipped over from vertical to horizontal position, or the other way around. When using the overhead crane for such an action, it is not only very risky, it is also taking a lot of time and occupies the urgently needed crane capacity unnecessarily.

For save and quick handling of such huge components **HAANE** welding systems has developed a special tilting table. This tilting table, as a standard, can manipulate components up to 80 metric tons of weight, diameters up to 10.000 mm, cylindrical as well as conical shapes.



OFFSHORE STRUCTURES – CIRCULAR WELDING OUTSIDE & INSIDE

Nowadays, if an offshore project has been approved and is being started, the investors want to get the installation working as fast as possible. Time is money.

But there are offshore structures of tremendous size, large diameters, and wall thicknesses up to 150 mm. A lot of welding needs to be done within a very short time. In order to achieve this you have to pull out all possible stops.

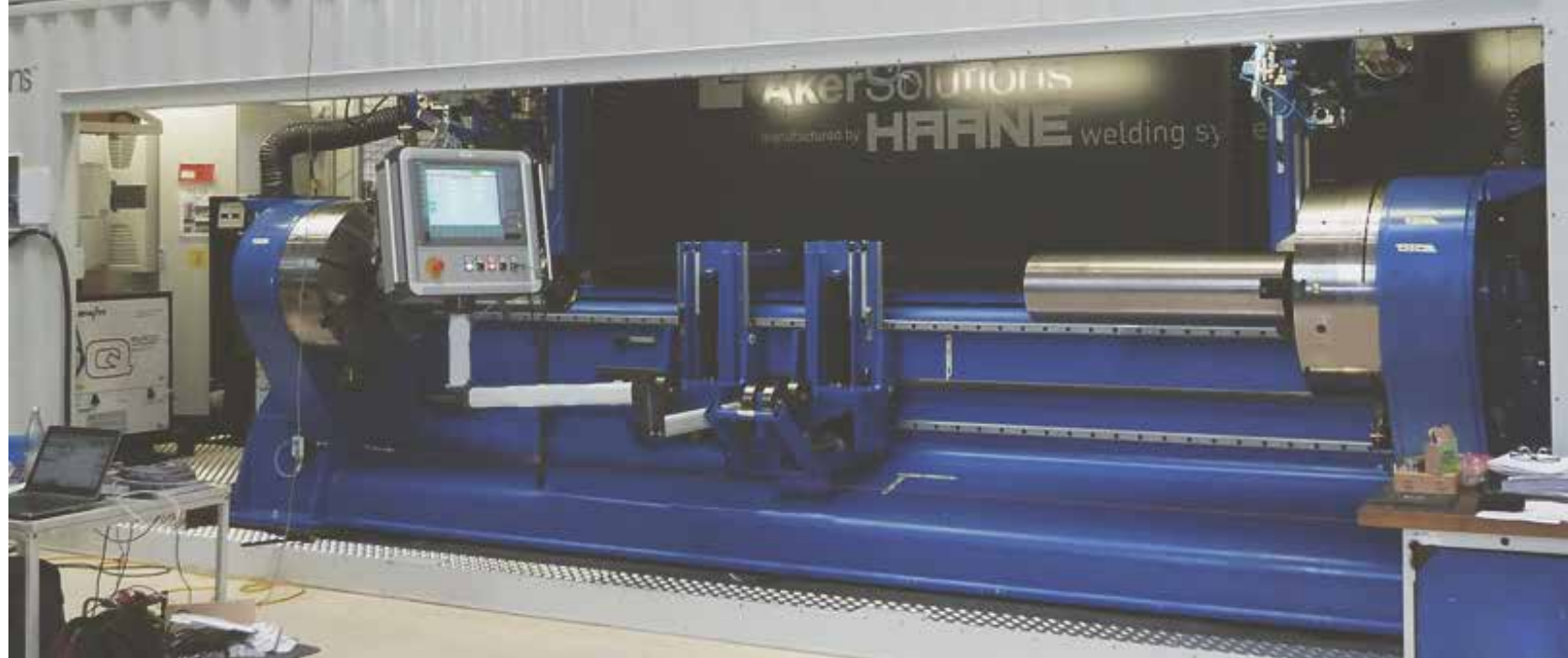
The fit-up must be optimized and the welding must be most efficient by using narrow gap solutions, increasing

the weld deposit to maximum, bringing ancillary times to a minimum and boosting up the arc times.

HAANE welding systems, delivers huge welding platforms with several multi-wire welding heads working at the same time at the same workpiece observed by one operator only. A very high degree of automation makes it possible to achieve the requested productivity.

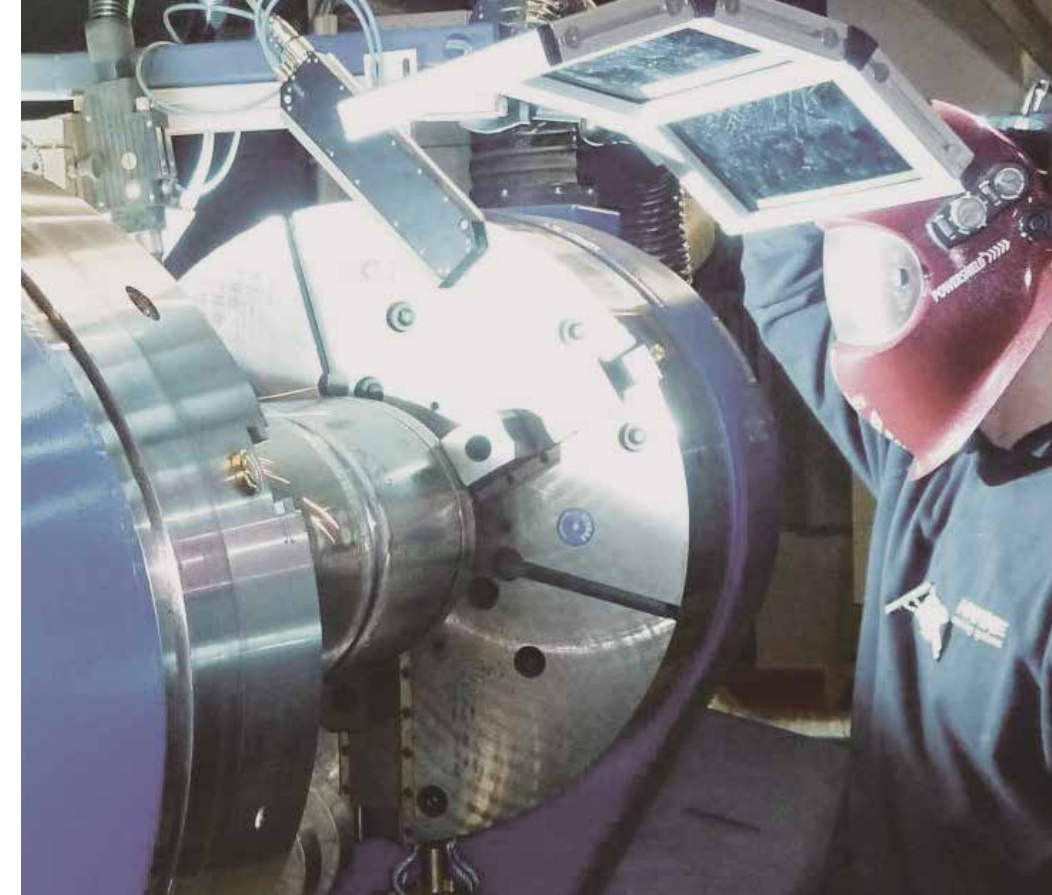
A telescopic boom extends up to 12.000 mm into the pile, which leads in production to an optimum balance between fit up job and welding job for highest efficiency.





SUBSEA COMPONENTS PIPE SHOP

HAANE welding systems provides stationary as well as mobile welding equipment for automated joint welding pipe-to-pipe, flange-to-pipe, elbow-to-pipe, as done here with TIG and GMAW welding process. SAW process is also an option. A combination of two processes is very efficient and fulfils customer's requirement.



Laser scanners allow for a good seam tracking, and purging devices guarantee a low oxide, clean root appearance. Duplex-/Super-Duplex-, stainless steels, and nickel clad carbon steels, alloy steels from the heat-resistant series, all this are eligible materials.

All of this is integrated into a navigable 40"-container, including a small workshop, joint bevelling tools and climate chambers for save storing of welding consumables.

Only one single, voltage stabilized electrical connection point for the entire equipment allows almost all worldwide common line voltages can be fed in.



VALVES

HAANE welding systems provides heavy duty head & tailstock positioner, which are used for example for welding of x-large valves.

Powerful double-motor servo drive, very stiff table plate, spindle driven tailstock, roller guided beam carriage for accurate positioning of the MultiMode-Welding Head, welding & positioning controller are features for this welding installation for ending up with the best welding results.

Using **HAANE** welding systems MultiMode SAW Process is a very good choice, when it comes to small diameters together with big wall thickness and narrow grooves. You can use for example a 4,0 mm wire for the root and hot passes for getting good penetration and easy slag removal, then easily switch over and use 2x2,0 mm wire for getting best possible deposit rate when welding the fill layers.



PIPE CLADDING

There are different reasons for doing weld overlaying inside pipes.

One reason is that erosive media or cavitation are destroying the pipe or valve seat material. In order to increase the lifetime of such components hard surfacing by welding is a good method.

Another reason is that the media going through the pipe may create corrosion and destroy the pipe material. The use of clad pipes is a good option here. CLAD pipes are perfectly combining two features: Corrosive resistance and very good mechanical properties with cost advantage compared to solid/pure CRA pipe materials.

When such CLAD line pipes are produced, the welded long seam must be finished with the same good CRA properties as the CLAD inside the pipe.

HAANE welding systems delivers complete systems for these jobs, doing inside electro strip cladding ESW, for long seams as well as circular seams at double-joint stations (DJ).

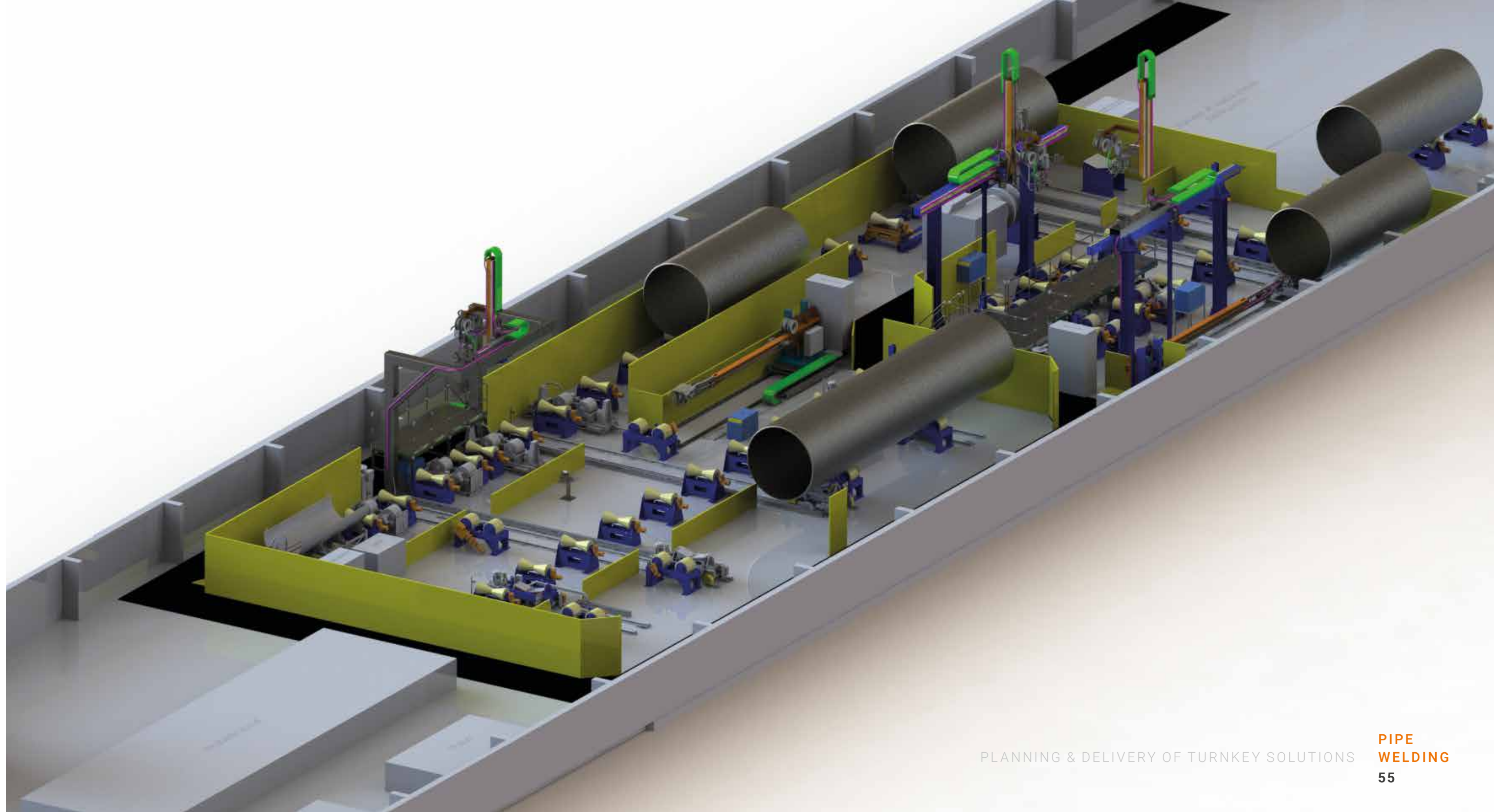
Processes we use for weld overlay inside pipes are: ESW electro slag cladding, TIG, GMAW, Open Arc



PLANNING & DELIVERY OF TURNKEY SOLUTIONS

HAANE welding system offers design studies and factory layouts for your newly planned or reorganized production line. And we can make it real.

We deliver turnkey solutions, including the entire equipment that is needed for your manufacturing process, from plate cutting up to NDT-testing equipment with all steps in between.





CUSTOMIZED PLC WELDING CONTROLLER & WELD DOCUMENTATION SYSTEM

Data Documentation and Pipe Tack & Trace System

The acquisition, analysis and storage of process data is an important building block for quality management. The additional inclusion of workpiece and machine data gives further important information to production planning and maintenance (condition monitoring), a preliminary stage to Industry 4.0.

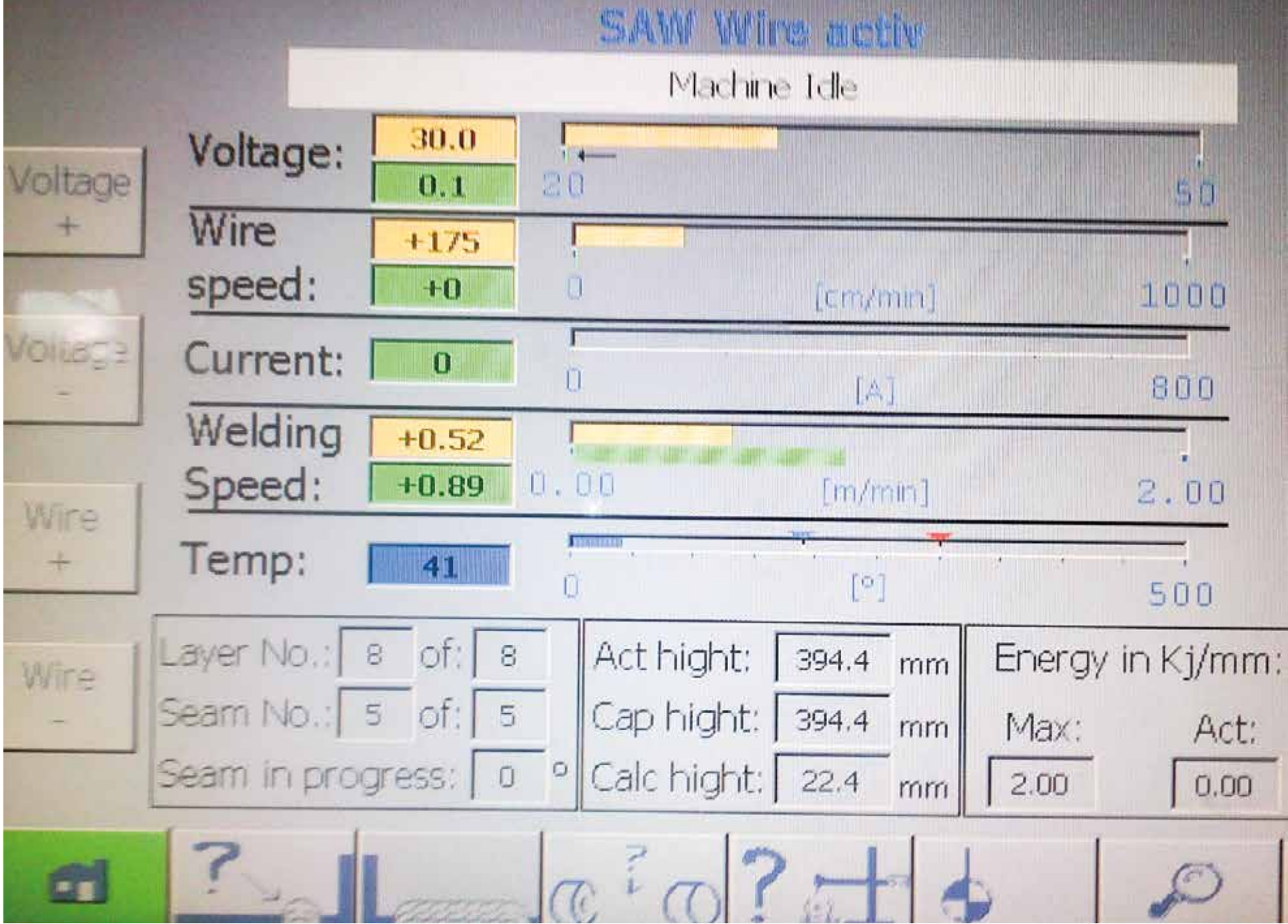


TRACK & TRACE SYSTEM

If the data from all the various individual production processes involved, including operator identification , can now be referenced to a single, identifiable component, an ideal production tracking module is obtained.

However, in the existing production there is usually a very heterogeneous machine park with systems of different kinds and different ages. In this case, linking the respective machine data in the sense of a network, creating interoperability is a particular challenge.

HAANE welding systems and KLANN Automatisierungstechnik offer such functionality with the Pipe Track & Trace System.



PROCESS DEVELOPMENT

If you want to optimize a process of your production apart from the mainstream, but in any event you want to keep it confidential: **Please contact us.**

- » We are the right partner to help you face your individual challenges.
- » We are competent and discreet, and we know how to handle a confidentiality agreement.
- » We can help you to optimize everything around your production process.
- » If you need a specific solution, let us know – our experts will find it!



REFERENCE LIST

We proudly present some of our renowned customers:

- » Aker Solutions AS, Norway
- » Allseas Engineering bv, The Netherlands
- » Arcelor Projects Spiral Mill Bv, The Netherlands
- » Berg Steel Pipe Corporation, USA
- » Bharat Heavy Electricals Ltd., India
- » Böhler Schweißtechnik Deutschland GmbH, Germany
- » Caterpillar Global Mining HMS GmbH, Germany
- » Corinth Pipeworks s.A., Greece
- » Essar - Hazira Pipe Mill Limited, India
- » Europipe GmbH, Germany
- » Federal Institute for Materials Research and Testing, Germany
- » FST Industrie GmbH, Germany
- » Jindal SAW Ltd., India
- » OSX Construção Naval S.A., Brazil
- » PSL Ltd., India
- » PSL North America, USA
- » Salzgitter Mannesmann Großrohr GmbH, Germany
- » Maschinenbau Scholz GmbH & Co. KG, Germany
- » Siemens AG, Germany
- » Sempell AG, Germany
- » SIF Group b.v., The Netherlands
- » Sulzer Metco AG, Switzerland
- » Ümran, Turkey
- » VandeGrijp Bv, The Netherlands
- » Welspun Gujarat Steel Pipe Ltd., India



COOPERATION, PARTICIPATION & DISTRIBUTORS WORLDWIDE

KLANN

AUTOMATISIERUNGSTECHNIK

- » Automation and drive concept
- » Automation of rolling mills and steel strip plants
- » Retrofitting and upgrading for existing plants
- » Control, regulation and automation systems of processing plants
- » Hard and software-engineering
- » Assembly, commissioning and service
- » Safety engineering

HWS

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WELDING / CUTTING / HANDLING

WELDING AUTOMATION – INNOVATIVE & CUSTOMIZED SOLUTIONS