

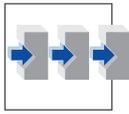
HAEUSLER

the forming factory



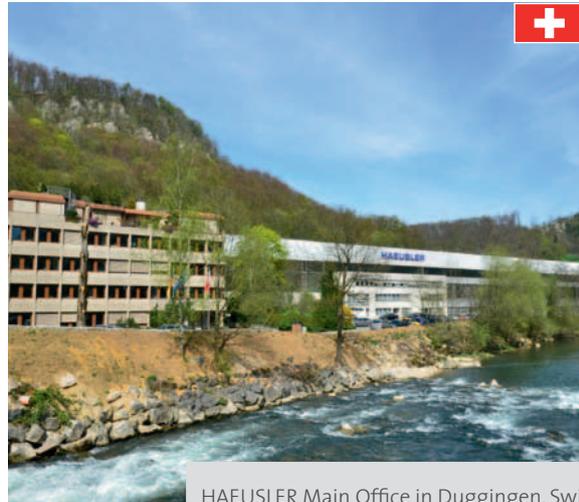
Pipe Mill

The solution for LSAW pipe production



We at HAEUSLER

HAEUSLER is one of the world's leading companies in the field of metal forming. With more than 80 years of experience we have always been and still are pioneers in developing innovative machines. What once started as a small locksmith's shop in 1936 is now a successful, future-oriented family business in the field of metal bending, forming and general assembly technologies. Our goal is to provide our customers with first class one-off machines, innovative custom solutions and entire highly efficient production lines. All designed and manufactured by HAEUSLER.



HAEUSLER Main Office in Duggingen, Switzerland



In use around the world

HAEUSLER is an export-oriented company. Our machines and equipment are in operation on all continents and in more than 70 countries in total. Shown below is an extract of HAEUSLER's reference list.



America

- Berg Steel Pipe Corp., US
- Confab, BR
- Siat S.A., AR
- Tenaris Siat, AR
- Tuberias Procarsa, MX

Europe

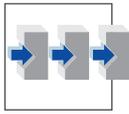
- Bergrohr, DE
- Corus, GB
- EEW Erndtebrücker Eisenwerk, DE
- Eisenbau Krämer, DE
- Khartsyzsk, UA
- PPSO SHELFPROEKTSTROJ (ETPM), AZ
- TMK, RU
- UMRAN STEEL PIPE, TR
- Zagorsky Pipe Plant, RU

Africa / Middle East

- Ahwaz Pipe Mills Co., IR
- Arabian Pipes, SA
- Global Pipe Company; SA
- IPIC, EG
- JPIOS, AE
- KPIOS, KW
- SAFA, IR
- SMT; SU
- WestcomWireless, NG

Asia

- Bakrie + Brothers, Jarka, ID
- Canadoil Asia Ltd., TH
- Dong Yang Steel Pipe, KR
- Histeel, KR
- Hyundai Pipe, KR
- MAN Aluminium, IN
- MAN Industries (India) Ltd., IN
- Pikaron, TR
- Pusan Steel Corp., KR
- PV Pipe, Vietnam, VN
- Sumitomo Metal Industries Ltd., JP



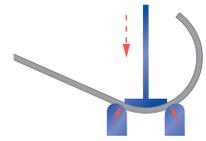
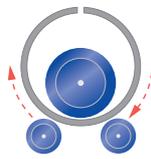
The Benefits of Rolling

There are different technologies for the production of LSAW-pipes. As with most industrial equipment, there are a few key parameters to benchmark the technologies. Typical benefits of roll bending (RB) are flexibility, bending quality, investment, output and Return on Investment.

HAEUSLER RB PIPE MILL

UO PIPE MILL

JCO PIPE MILL



	HAEUSLER RB PIPE MILL	UO PIPE MILL	JCO PIPE MILL
Low investment and running costs	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
Output	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roundness after bending (variance in transition zone and polygon effect)	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Stress homogeneity (in the pipe after bending)	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Process flexibility (Tool changes and duration)	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> *
			* when using forming die
Insensitive to material variances	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Few bending tools required	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> *
			* when using forming die
Return on Investment	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Shifting the limits

1990 HAEUSLER produced the first roll bending mill for the production of 12 m LSAW pipes.

This was the beginning of the success story that has continued until today and that has resulted in a market share of 70 percent in the LSAW pipe production sector.

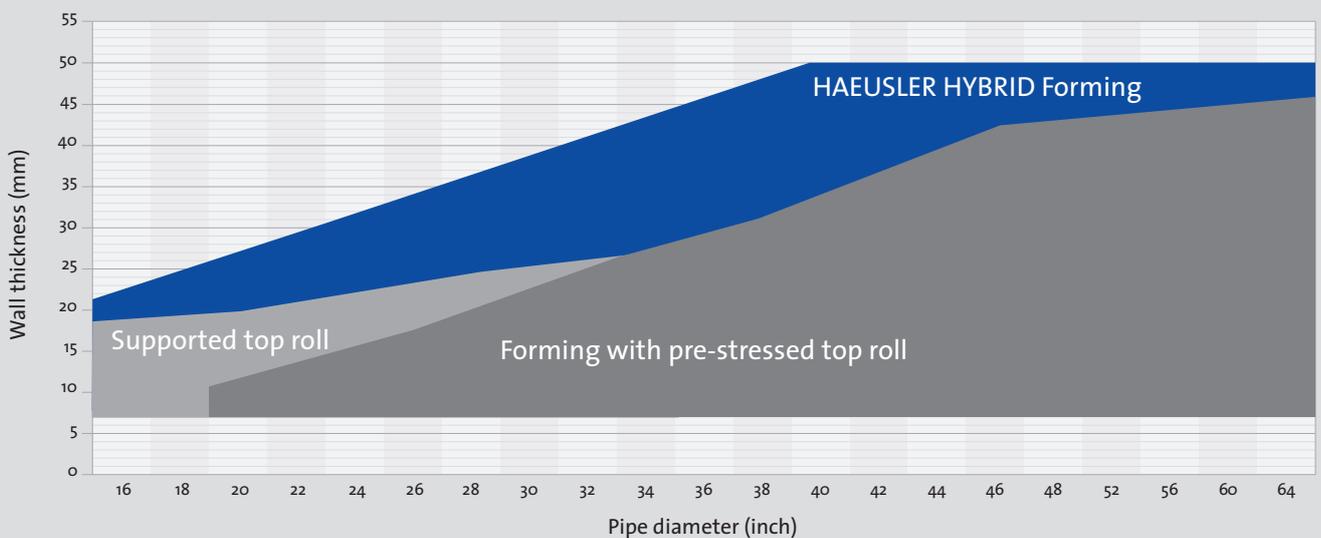
Other processes were only employed due to the limitations of the roll bending process with regards to the pipe diameter and wall thickness ratio.

2001 Shifted the limits in favor of roll bending by the supported top roll developed by HAEUSLER

2014 The new, further-developed and revolutionary HAEUSLER HYBRID Technology now ensures absolute flexibility in the use of the roll bending process over the entire LSAW pipe production range.



Capacity for LSAW pipe production



As a general contractor for turnkey pipe mill solutions, HAEUSLER offers all key machines as in-house products. Therefore all relevant sections of the HAEUSLER pipe mill process are produced from one source.

Beside the hardware production HAEUSLER offers a wide range of supplementary services for successful completion of your project and the long-term operation of your production plant.

Engineering

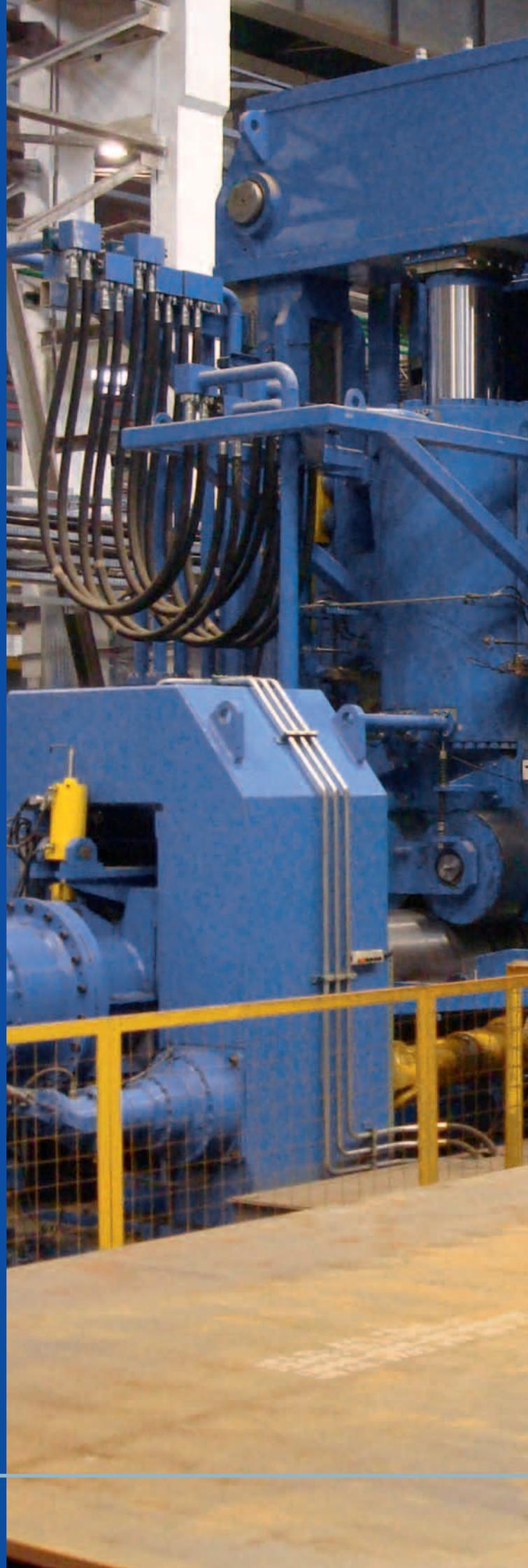
- Plant engineering
- Civil engineering documents
- Basic engineering for grounding
- Basic engineering for media networks like water, air, power, cooling systems and technical gases
- Basic engineering for drain systems and waste water treatment

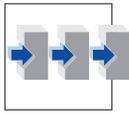
Accessories

- Quality Assurance Laboratory
- Maintenance workshop
- Spare parts logistics
- Consumables
- Transport and lifting equipment

Services

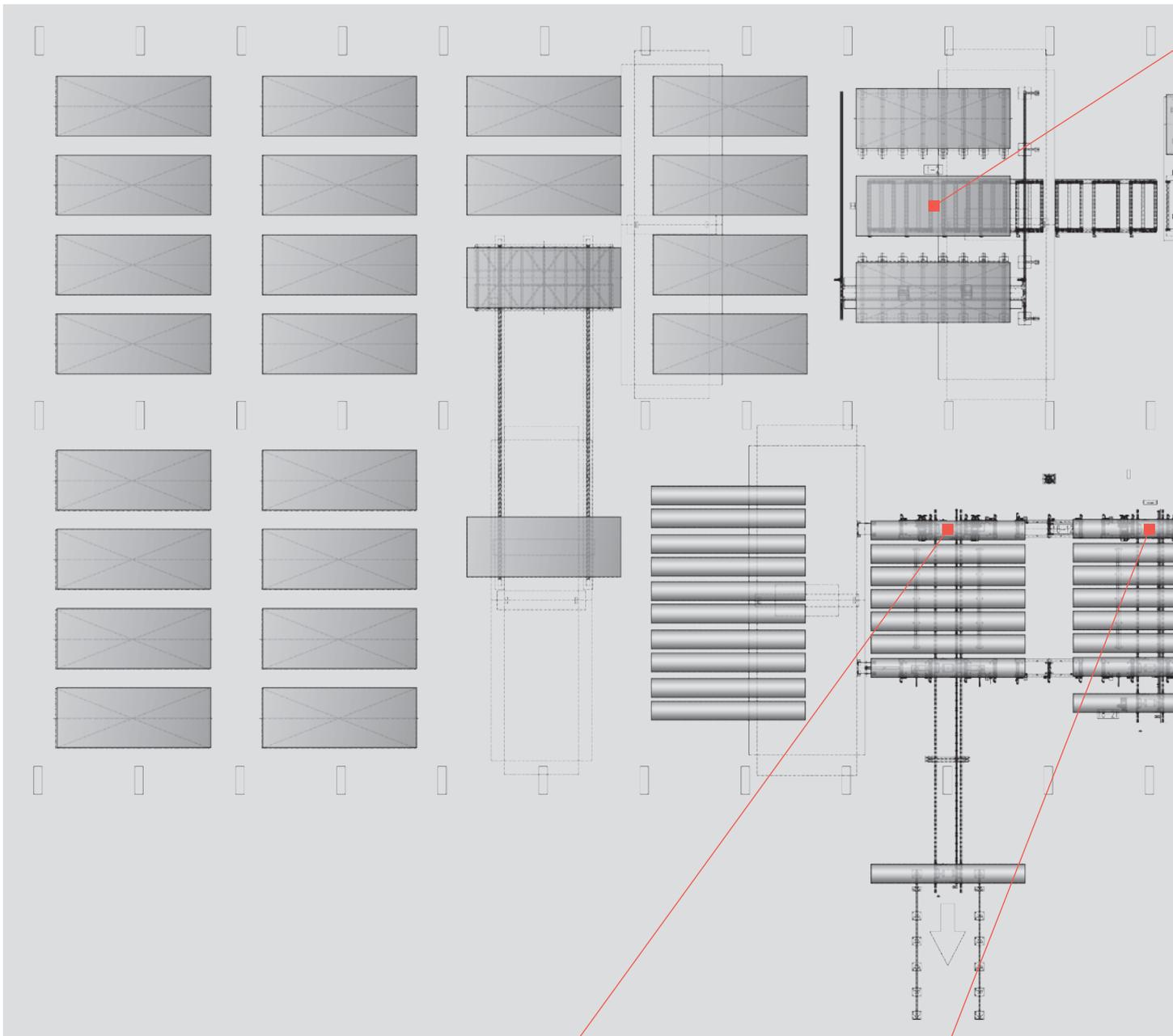
- Site management and installation
- Training
- Production support
- Repair services
- Certification support
- Plant modernization



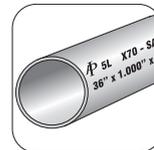


From plate to pipe with HAEUSLER

Working closely with our customers, we are developing tailored solutions for individual requirements. The degree of automation, production output and the quality standard which needs to be achieved are the key factors defining the final structure and workflow of the individual production steps. To merge the different production steps into a well-coordinated, sustainable, economical and long lasting pipe mill is the core competence of HAEUSLER's plant engineers.



End clients' inspection

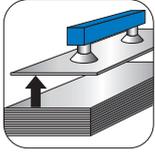


Marking

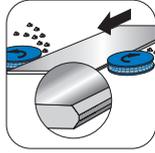


Final inspection

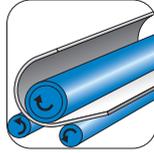
Plate de-stacking



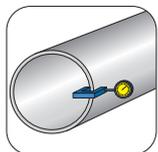
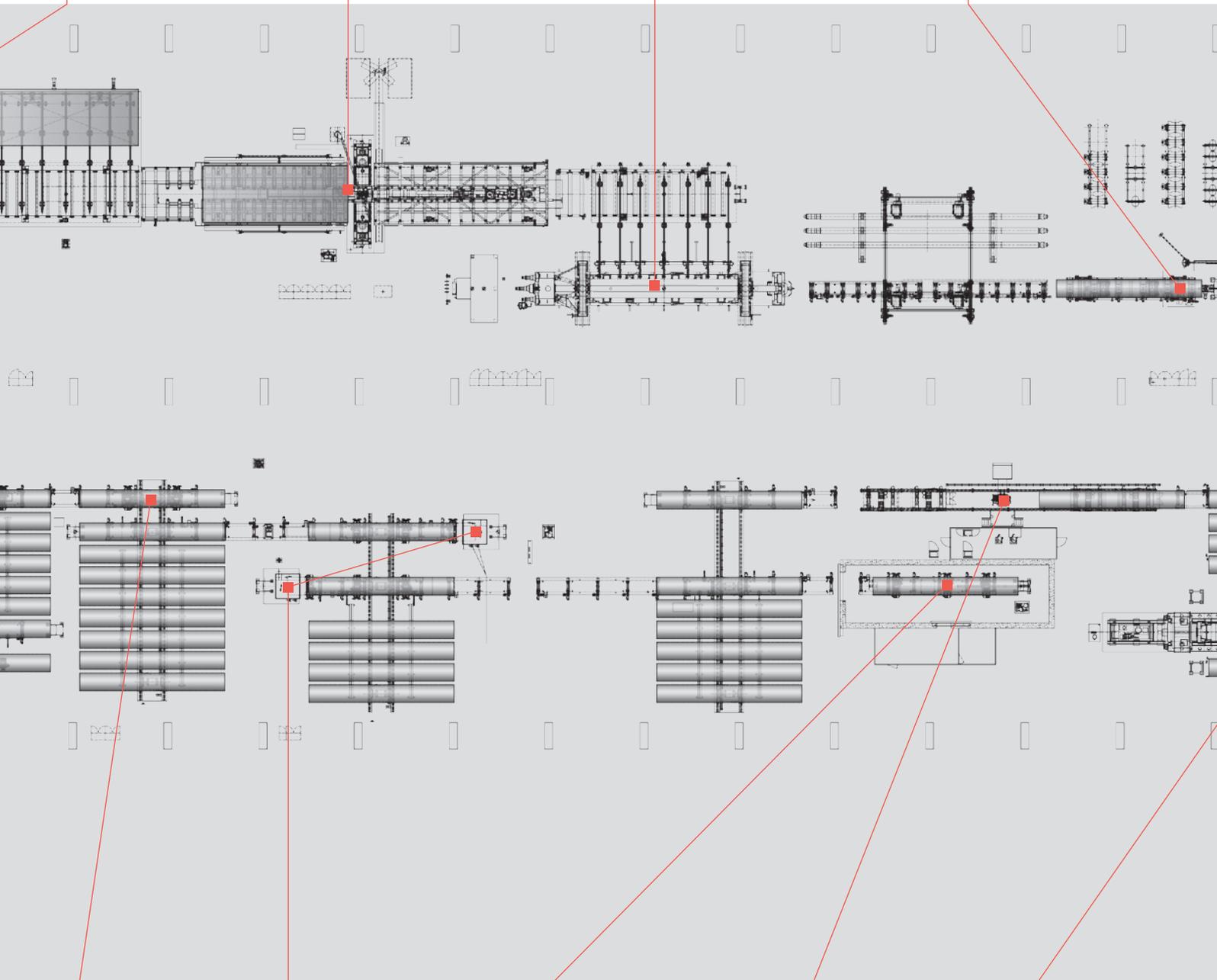
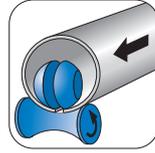
Edge preparation



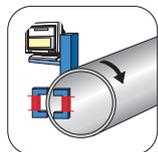
Roll bending



Edge forming



Weighing and measuring



Magnetic particle inspection



X-ray testing



Ultrasonic testing



Hydro testing

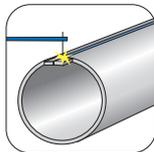
Root welding



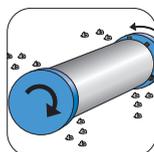
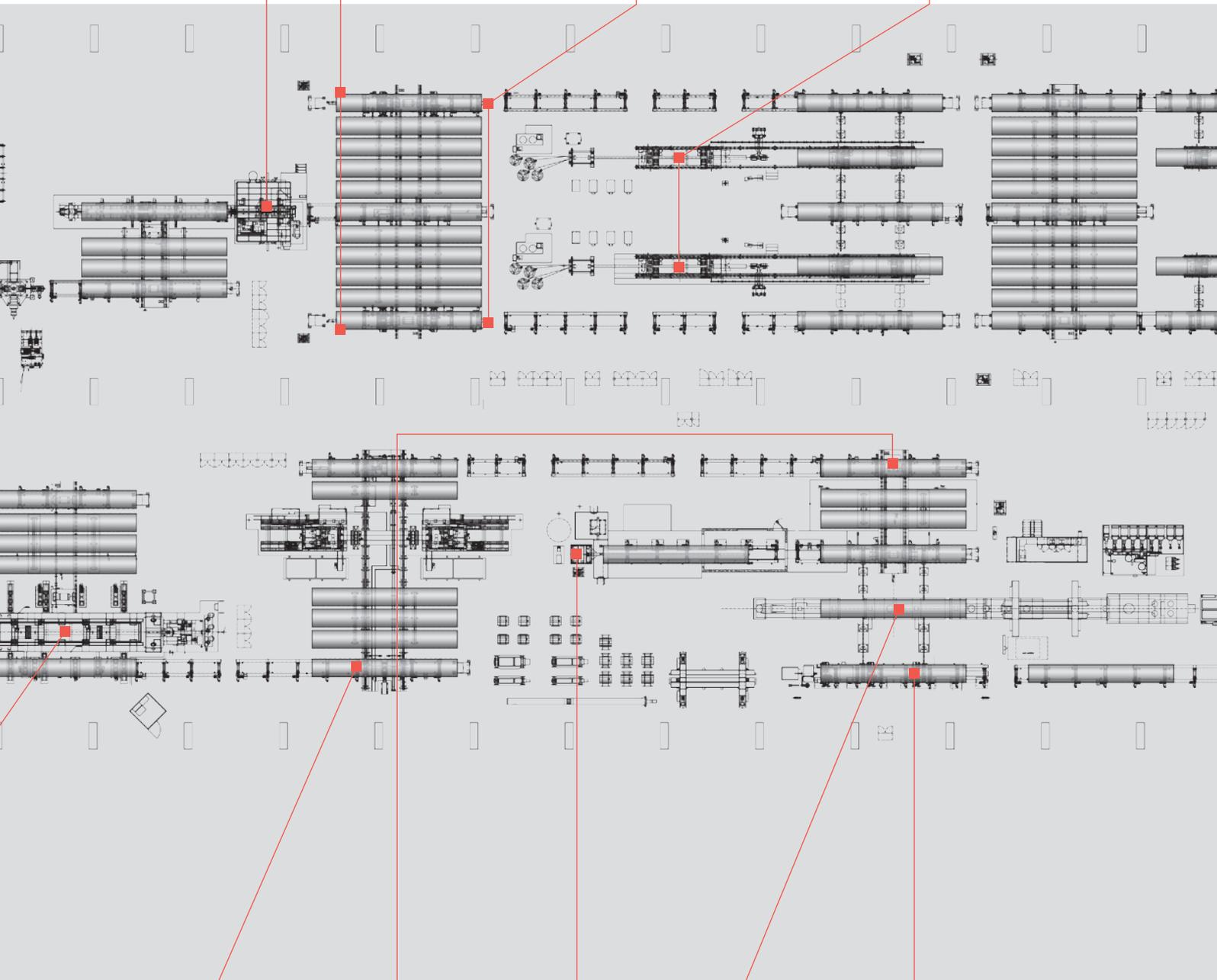
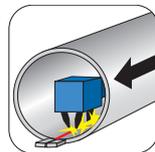
Visual inspection



Weld-on taps



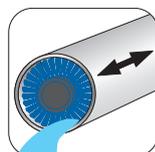
Internal welding



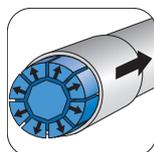
End bevelling



Specimen taking



Post-washing

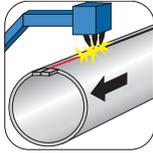


Expanding

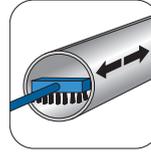


Pre-washing

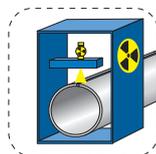
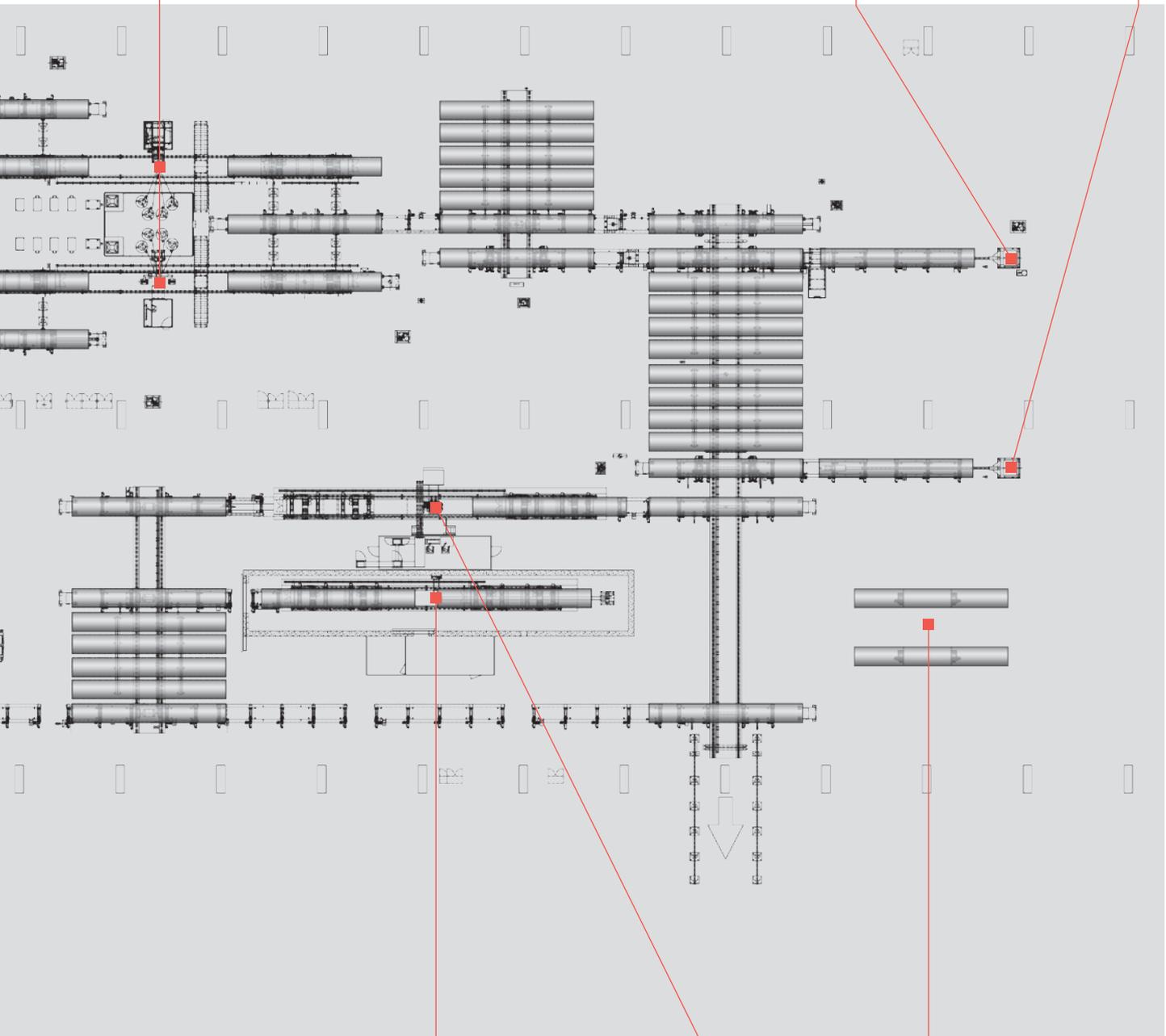
External welding



Pipe cleaning



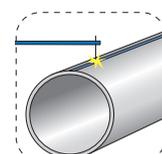
Visual inspection



X-ray testing

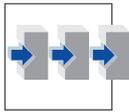


Ultrasonic testing



Weld repair





Roll forming – for every pipe mill the right process

Only HAEUSLER offers the unique option to produce pipes in three different processes combined in one machine:

- Forming with a pre-stressed top roll
- Forming with supported top roll
- Forming with press die



Roll forming

- Reliable plant output due to fast roll forming process
- High quality pipe due to continuous forming process
- Easy control of the bending process and highly reproducible forming results

Forming with a pre-stressed top roll

The conventional way of rounding large pipes in a diameter range of 20 to 64" is by using a pre-stressed top roll in combination with a variable bottom roll distance. This guarantees optimum utilization of the installed bending

power while maintaining a consistent pipe quality. The complete diameter range of the plant can be covered using two to three top rolls which can be exchanged quickly.

Forming with supported top roll – a HAEUSLER innovation!

As a result of continuous development HAEUSLER added the supported top roll, which opens a new wall thickness range for pipe diameters from 16 to 32". This new feature combines the advantages of roll bending with capacities previously reserved to press forming processes.



Roll forming with supported top roll

- Maximum capacity range in high wall thickness application
- Flexible production due to few tooling and fast tool change



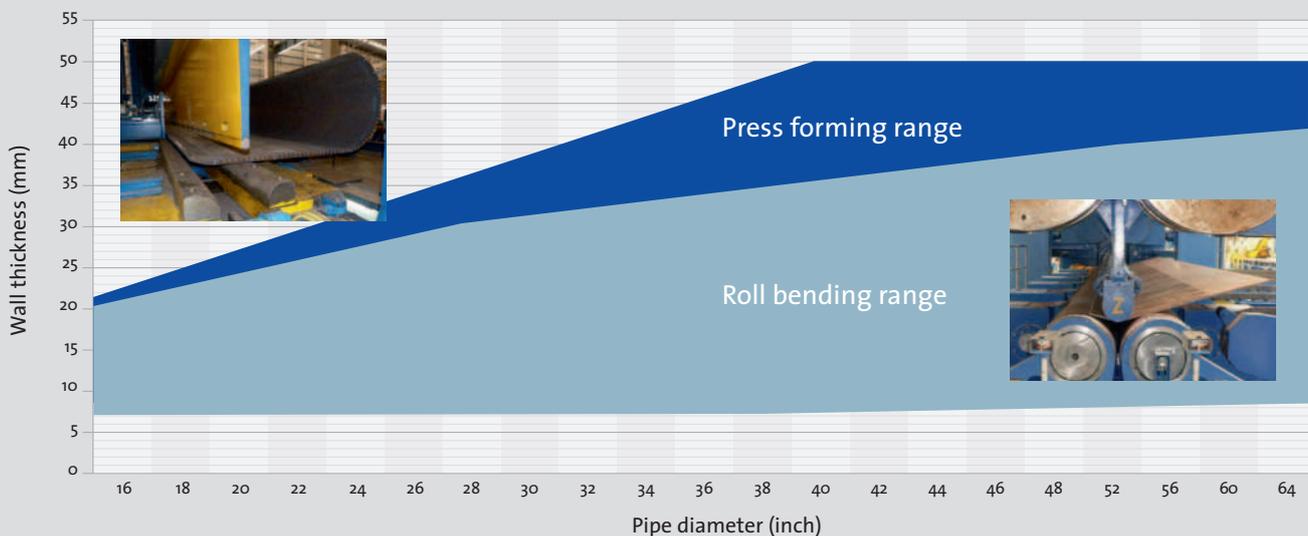
Forming with additional press die HAEUSLER HYBRID TECHNOLOGY HHT

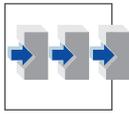
The newest development combines the advantages of roll forming with the range of press forming. The new Hybrid machine replaces the JCO forming for all pipe mills going for high efficiency.

Press forming with HHT

- Very small diameters, heavy wall thickness
- Unlimited in pipe length

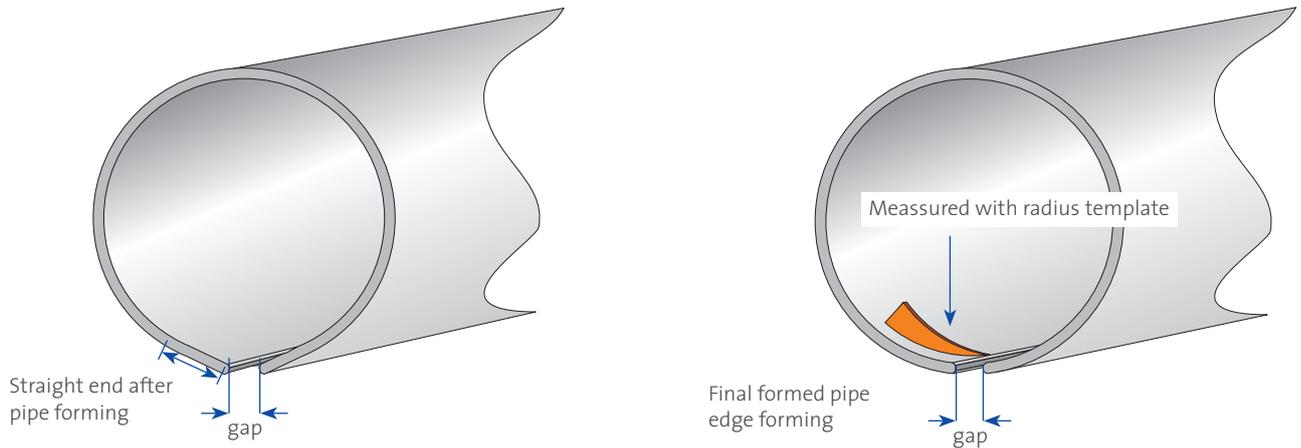
General capacity of HHT and overview of the two bending processes





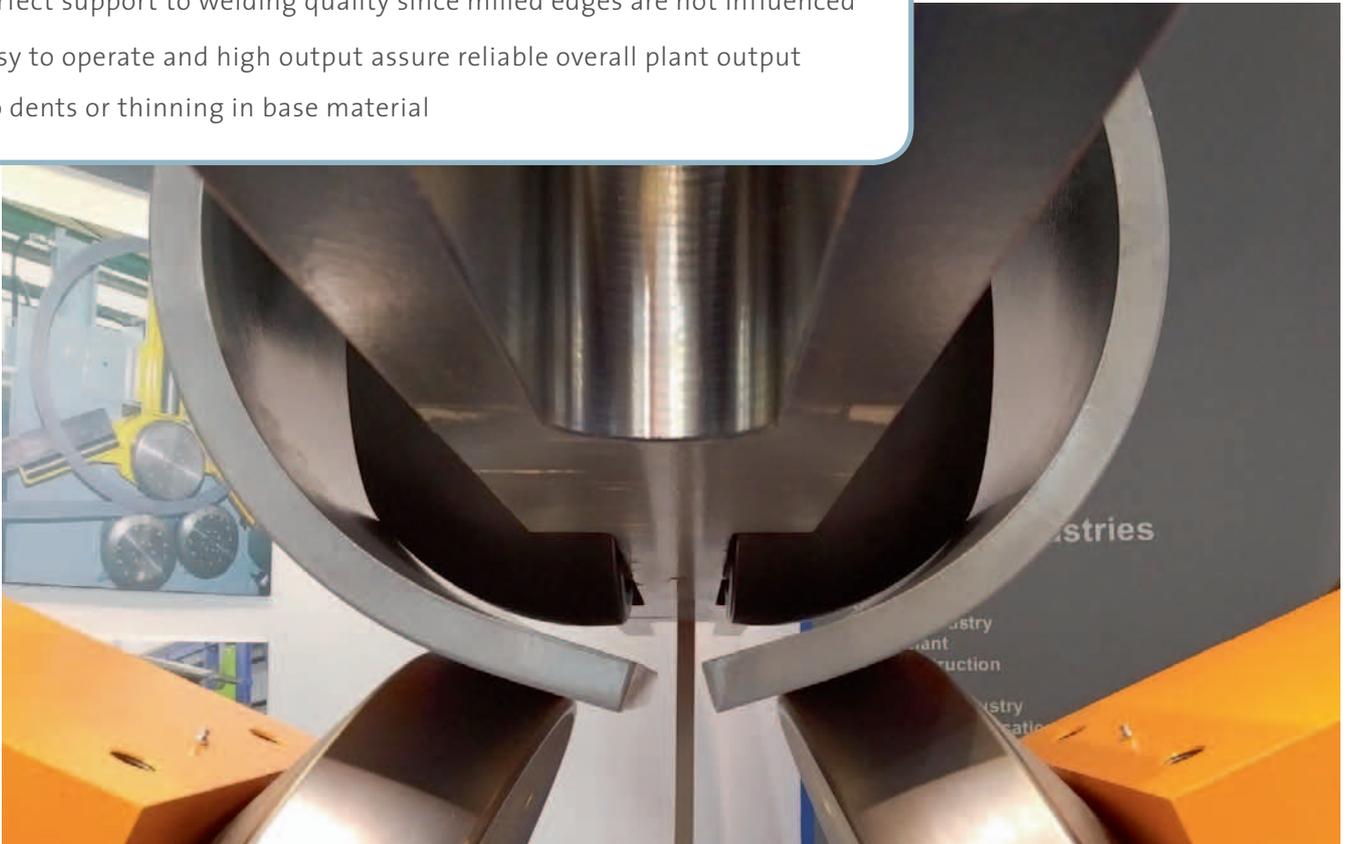
Edge forming – perfect edges for all pipe dimensions

The consequent development of post-bending results in the new continuous edge forming process. This process is by far the most advanced method to form straight ends on the pre-formed slot pipes.



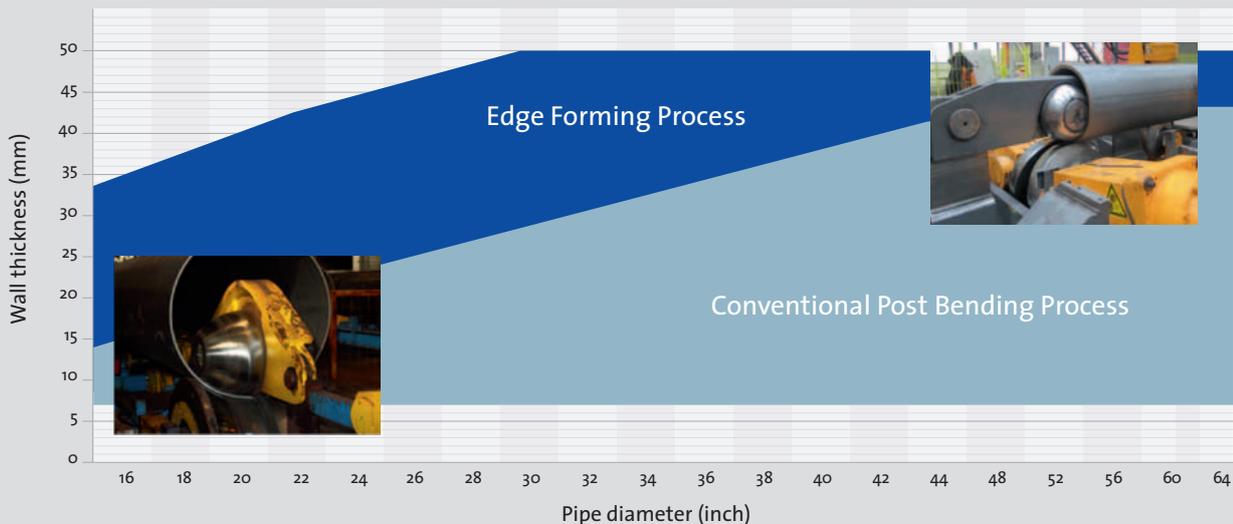
Edge forming

- High end pipe quality due to continuous forming process without transmission zone
- Perfect support to welding quality since milled edges are not influenced
- Easy to operate and high output assure reliable overall plant output
- No dents or thinning in base material



The new patented edge forming system of HAEUSLER shifting the limits of all the known post bending processes to cover complete pipe manufactures demand.

Capacity of HAEUSLER edge crimping process for LSAW pipes based on steel grade X 70 with 530 N/mm²



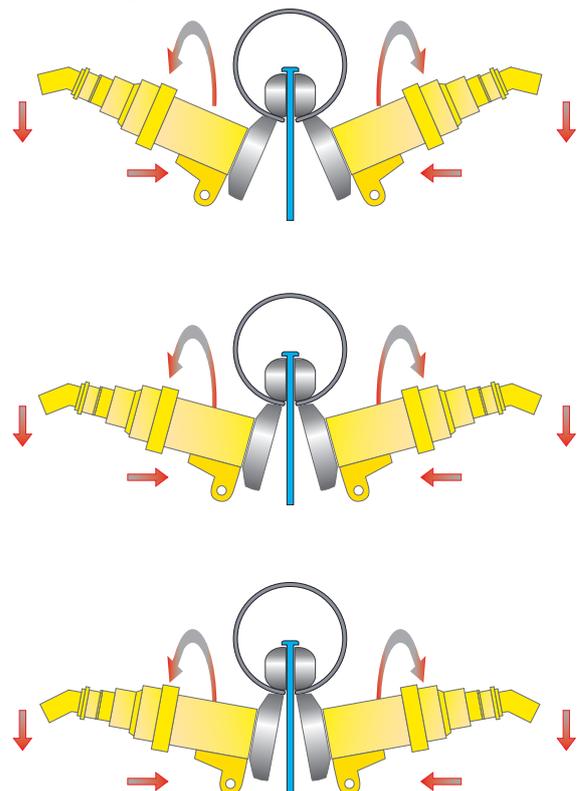
Strong to the form but smooth to the edge

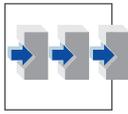
The diameter related top ball tooling is in fix position and the two universal forming rollers will bend the straight end in 3-7 steps until the requested diameter is reached for all straight end areas.

The forming rollers which are equipped with a heavy hydraulic motor in teamwork with the feed rollers will move the pipe through the controlled forming passes.

All forming roller movements are CNC-controlled and the edge forming process works fully automatical.

Since the forming rollers touching the pipe surface on a line and the area changes in every path there is no deformation or thinning on the base material.





Tack welding – 100% good pipes without edge offset

Accuracy of edge alignment and continuity of weld bead of the tack weld process is the mandatory basic for all following sub arc welding and therefore the key factor for the pipe quality. The latest generation of HAEUSLER tack welding machine assures

a new level of pipe quality due to active edge control during complete welding process. This patented system in combination with a high end CNC controlled laser tracking and digital welding equipment, provides the absolute production flexibility by assured stable output.

Tack welding

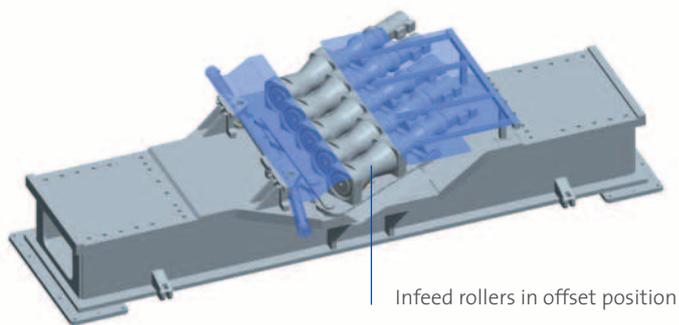
- No edge offset due to active spinning control
- Complete welded pipe ends due to independent high low roller
- Perfect welding quality due to homogeneous and smooth pipe feeding



Active spinning control

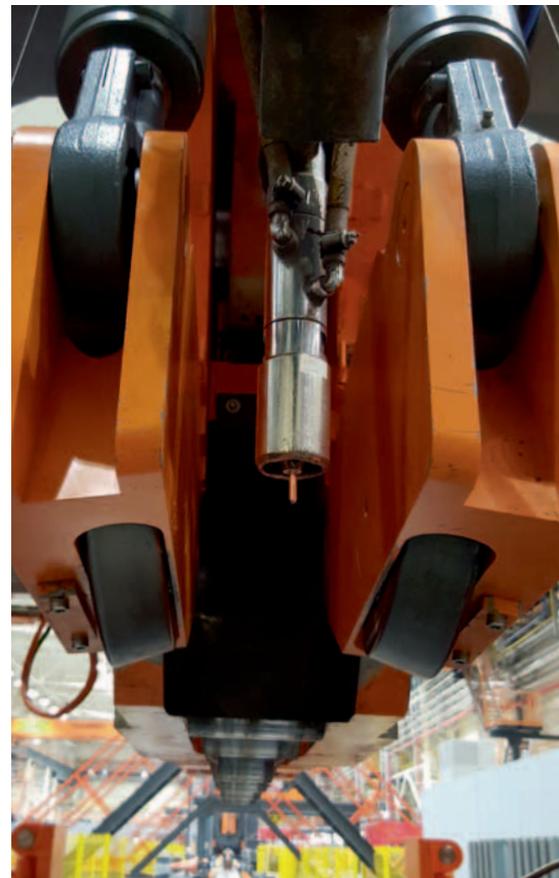
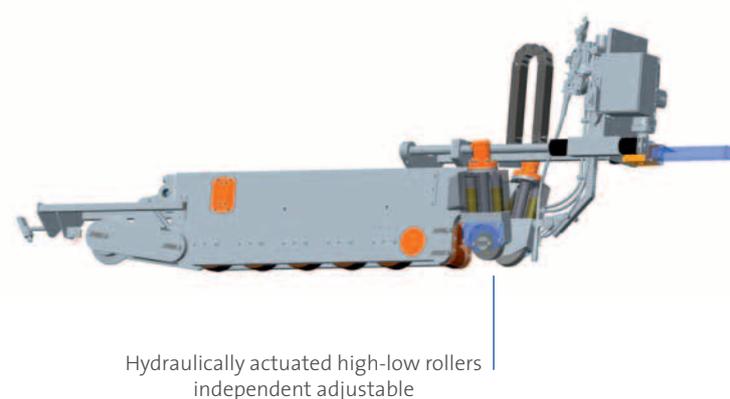
Beside the standard infeed conveyor, executed with diabolic rollers and lifetable turning rollers for adjustment of the pipe gap position, the machine main frame is executed with a swivelable diabolic roller arrangement.

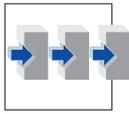
The rollers can be inclined by hydraulic cylinders. The inclination of the rollers is used to avoid pipe rotation during welding and to keep the offset of the welding head small in relation to the pipe center which leads to perfect and reproducible pipe quality.



Perfect welded pipe ends

To assure a perfect aligning of the pipe edges especially at the beginning and the end of the pipe, the top pressure beam is equipped with hydraulically actuated high-low-rollers in split design, which enable the welding head to be located directly at the point of closing.





Expanding – brings your pipe to the highest quality level

By the means of a stepwise expansion of the pipe, the mechanical full-body expander provides an uniform calibration process of the full pipe body in order to achieve constant high tolerances in diameter, roundness and straightness as well as a resistance test of the weld seam and an increase of the pipe material's yield strength.

Expanding is the final forming step in the production of pipes – it defines the final shape of the pipe in order to meet the required standards.

HAEUSLER offers the complete equipment including pre-washing, pipe expanding, expander tools, post-washing and water treatment.

Pipe Expanding

- 100% straight pipes due to patented clamping carriages
- Toughest pipe end tolerances due to variable process control
- Easy and long-lasting tool assembly due to unique head design
- Fast production change as equipment is very easy to adjust
- Best tool life time by minimum oil consumption due to smart lube system



HAEUSLER makes the difference

The development of the HAEUSLER CMR Expander is driven purely by the practical experience in our pipe mills made with different type of expander machines. In result the expander combines all relevant features that support our customers in producing high end pipes in an industrial environment focusing on quality and output. In result we merged a big list of single features to a latest state of the art production system.

Benchmark list:

- Biggest possible bearing surface on cone
- 2 carriage feeding system
- Liner and cone assembly permanent in touch
- Rack and pinion drives
- No manual adjustments for set up
- hydraulically pre-loaded tool fixation
- Individual lubrication lines on each segment
- Combined 4 chamber force and speed cylinder
- Pressure controlled hydraulic pumps by load sensing
- Individual double stroke in automatic program
- Tool changing device
- Pipe measuring system
- Automatic straightness correction modes



HAEUSLER Group took over Pipe Expander business



In consequence of growing strategy HAEUSLER has taken over the complete pipe business unit from the well known producer of full body pipe expanders, Fontijne Grotnes. HAEUSLER aims to supply the installed base of Fontijne pipe expanders with all inquired field services, tooling and spare parts.

HAEUSLER

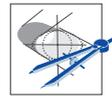
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PLATE BENDING



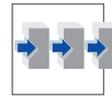
PROFILE BENDING



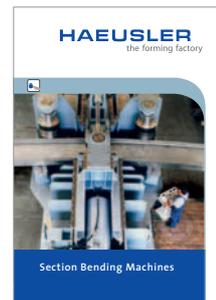
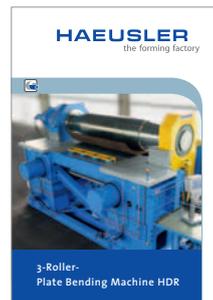
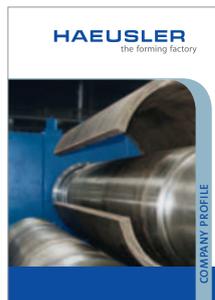
SPECIAL FORMING



ASSEMBLING EQUIPMENT



PRODUCTION LINES



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