



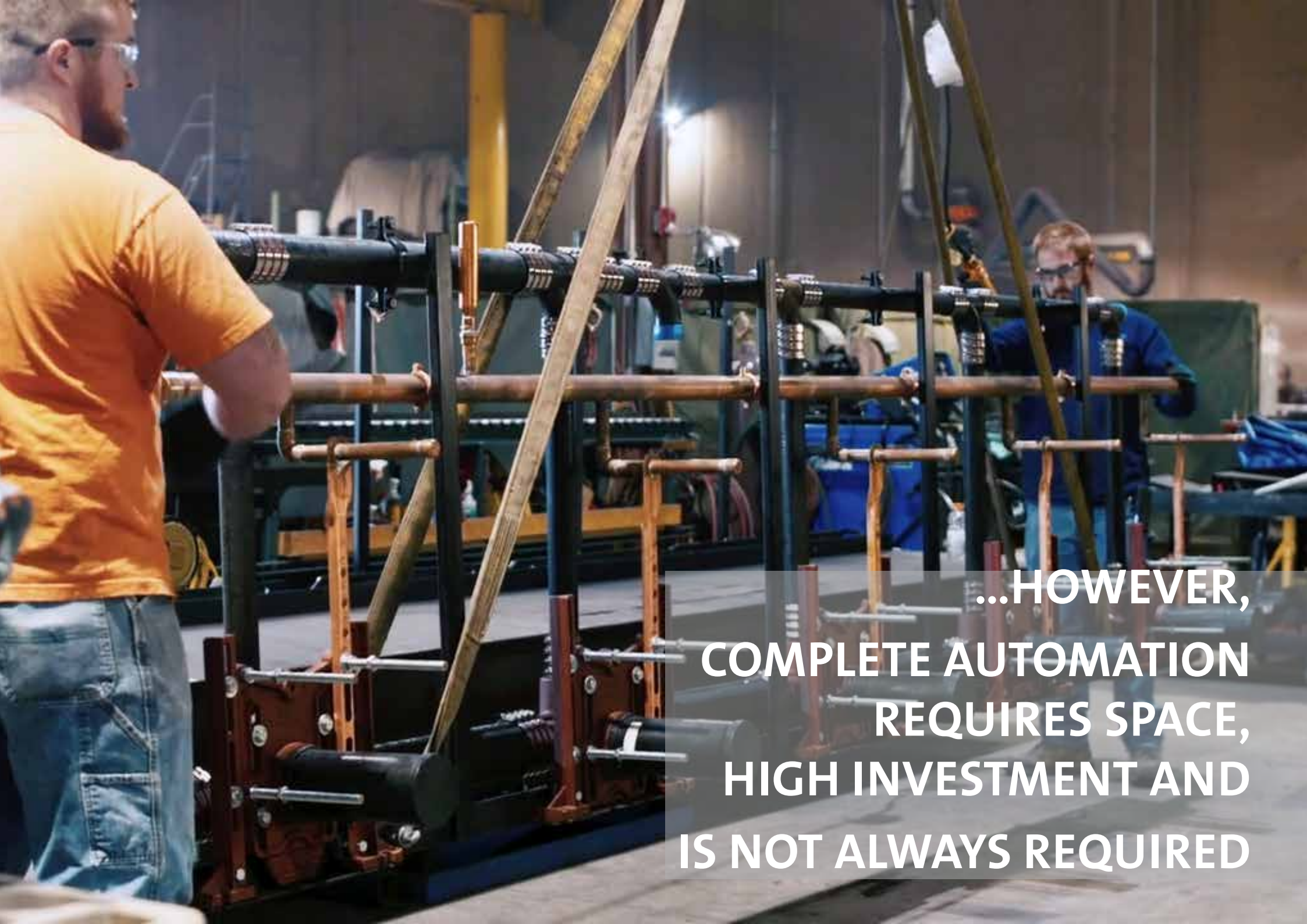
Product Description

ProCutter 900 RB



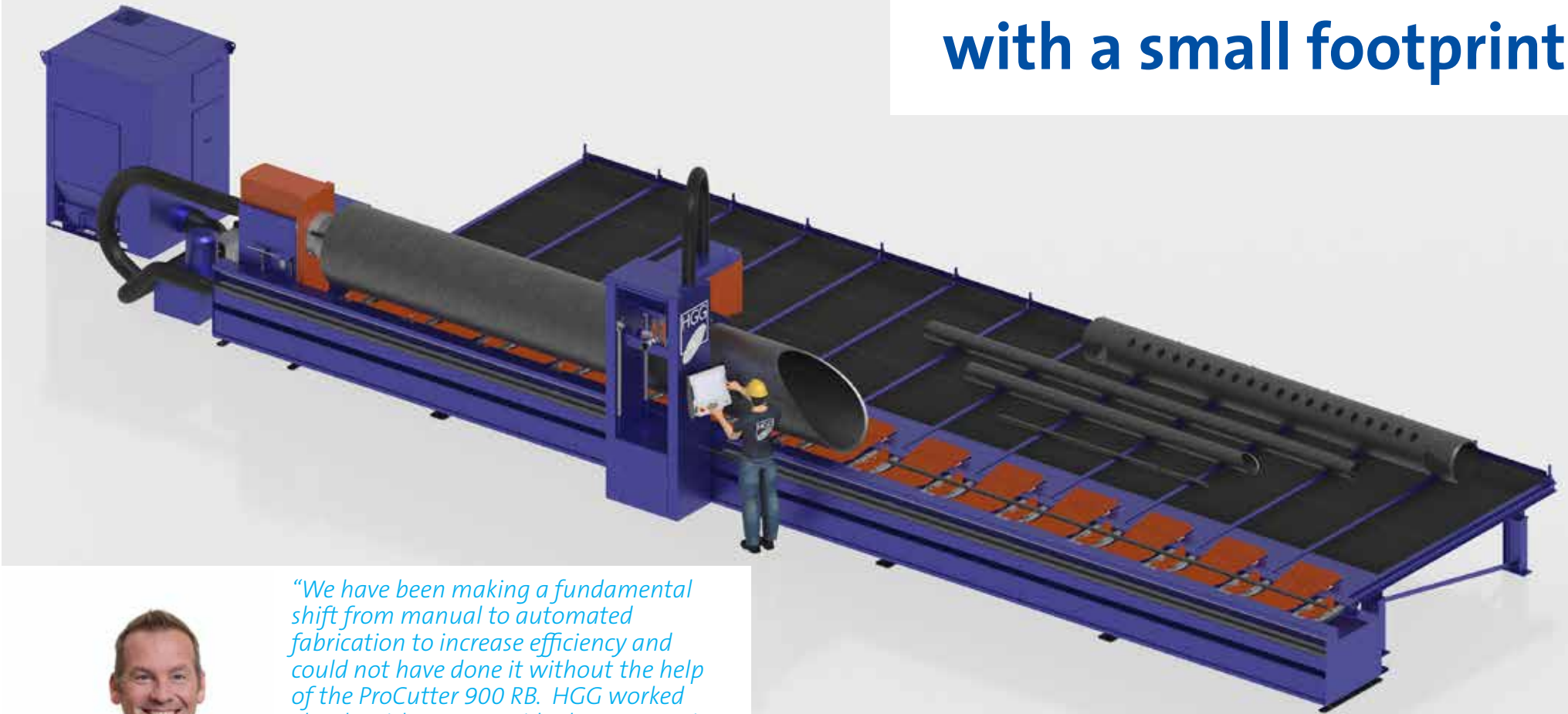
**MANUAL PIPE CUTTING
IS TIME CONSUMING
AND COSTLY...**





**...HOWEVER,
COMPLETE AUTOMATION
REQUIRES SPACE,
HIGH INVESTMENT AND
IS NOT ALWAYS REQUIRED**

**HGG offers
high productivity
with a small footprint!**



"We have been making a fundamental shift from manual to automated fabrication to increase efficiency and could not have done it without the help of the ProCutter 900 RB. HGG worked closely with us to provide the automation we need at an affordable price!"

Gabriel Ronk
MMC Contractors
Vice President of Operations

ProCutter 900 RB - *Content*



HGG - Specialists in 3D Profiling

The pipe cutting processes

The ProCutter 900 RB

Capabilities

Productivity

Accuracy

Software

Safety

Training

Service

Technical specifications

Machine Layout



The Company

With more than 35 years experience in the thermal cutting industry, HGG has grown into an international group that specializes in thermal cutting of 3D profiles. Two branches, concentrating on the development and production of 3D profiling machines and software or providing an extensive range of cutting services around the world. The unique combination of development and comprehensive use of 3D cutting machines, together with our passion to provide the perfect solution for all our customers, allows HGG to embrace all aspects of steel industries.

Through constant communication with our customers and innovative design initiatives, HGG is constantly evolving in order to offer a unique package of products and services. As specialists in 3D profiling, the design and fabrication of our machines incorporates the specific characteristics of the industry for which they are intended. This large product range and flexibility means that HGG can offer:



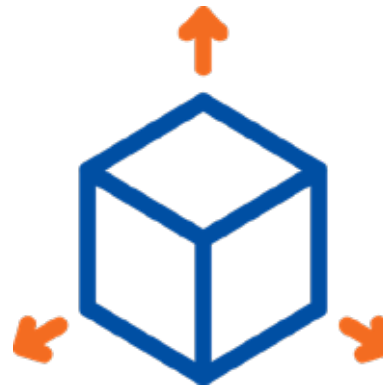
Extreme accuracy

The key to a perfectly cut part is the combination of accurate torch positioning and an optimised cutting process. Any kind of misalignment or deformation can be detected to alter the calculated theoretical cutting path by actual measurements of the material. This combination offers the highest attainable accuracy and thus provides substantial savings on fitting and welding.



Freedom to create

Each industry is unique and fabrication requires different shapes for profiling. All of our parameter based shapes are developed within the company, allowing the delivery of industry specific subsets. A wide range of profiling shapes is available to cover every conceivable need. Free-form designs created by solid modelling are supported too and deliver the highest possible design freedom.



User Friendliness

HGG focuses on consistent, intuitive, easy-to-use interfaces for its products. As a supplier of highly advanced 3D profiling technology, design detailing, production planning and production are taken into account with profiling shapes or CAD interfaces, manual programming, nesting or production reports, and intuitive user interfaces and machine operation.



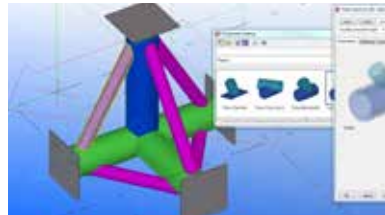
The pipe cutting process

The process

The production process of (stainless) steel piping mostly requires cutting of larger spools and smaller olets. Pipes are a difficult 3D shape to cut by hand and require a lot of measurements to perform correctly and often need a lot of grinding afterwards. The technological advances that have been made in the production industry allow automation to make cutting simpler, faster and more accurate. The process starts at the top of the chain, where material selection and stock length producers create the pipes used in construction.

Design

To keep all factors of the production process in check, a design team



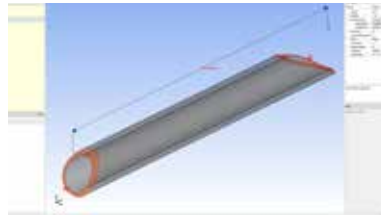
creates the construction and hands information over to work preparation digitally. Nowadays, a lot of design applications work in 3D, allowing users to prepare profiles for cutting immediately.

Work preparation

Preparing jobs for machines can be performed through integration with 3D CAD/CAM software or HGG's custom software where parts can be imported or new parts can be created. From work preparation, parts are sent as nestings to the machine.

Cutting process

A pipe cutting machine automates the work of manual cutting by removing the need for manual measurements



and the inconsistencies that can occur with manual work. Optionally, marking of footprints, text and contour lines can help during fitting. Pipe cutting machines create advantages in comparison to manual cutting by saving time for preparation, as measurements are done by the machine automatically, with cutting, because the process is much more constant than you can achieve manually, and later in the fitting process because of possible markings for positional identification and the amount of rework is reduced to a minimum. We are proud to say that HGG machines can net you up to saving 30% of fitting and welding time in addition to saving time during the cutting process.

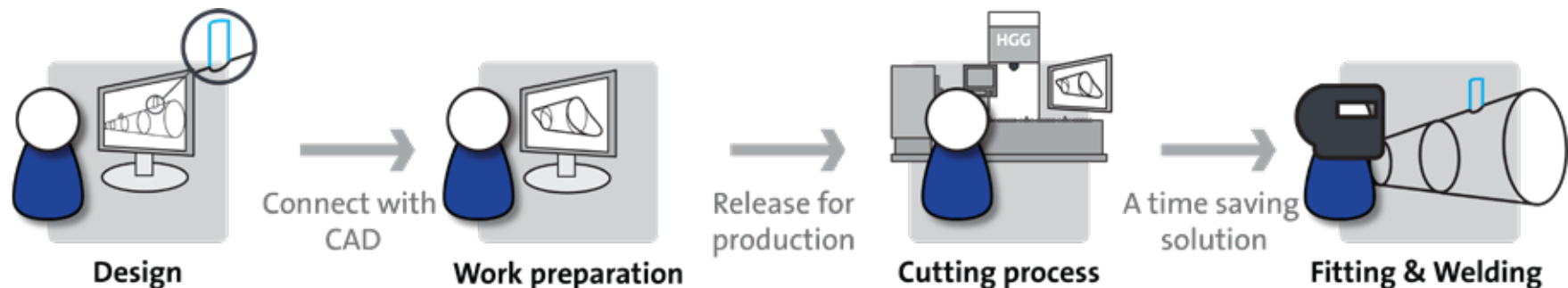


Fitting and welding

During fitting and welding, welders should be welding as much as possible. With the achievable reduction, in most cases – complete removal – of rework and perfect fitting ability, welders will only need to weld reducing their expensive hours to the bare necessity.

Construction

During construction, everything comes together to a big unified piece of steel. The construction phase being the most expensive, is preferably done without reworks, mistakes or changes. By acknowledging this wish, it is safe to say that the more time you spend in design and work preparation for the cutting process, can save a lot of expenses during construction.



The ProCutter 900 RB

Pipe cutting is a tedious task where all work used to be done manually. Measurements, cutting and marking can be done automatically by robots and CNC controlled machines and will result in much higher quality and faster production of pipes. To further optimize pipe cutting, the ProCutter 900 RB is rigid and durable, providing the ability to cut with the highest accuracy in the market and a long lasting machine.

Rigid frame structure foundation

To guarantee optimal cutting quality, the ProCutter 900 RB stands on top of a rigid frame structure foundation that is bolted to a level concrete floor. There are no additional costs for a foundation floor. The rigid frame supports pipes of different dimensions and sizes and lasts for multiple years.

Consisting of a roller bed, outfeed table, cutting trolley and main drive, the ProCutter 900RB has all components for high speed production and optimal cutting quality.

Roller bed logistics

A roller bed with linear transport to feed tubes into the jaws of the main drive automates pipe movement into the cutting area. There are multiple sensors that automatically stop the pipe at the correct position for the main drive to grip it. The automatic positioning takes away physical work for the operator to position the pipe.

Cutting trolley

The cutting trolley is the main processing unit with the cutting head and attached remote control. The cutting trolley is attached to the

frame securely and moves along the roller bed to cut the pipe at different positions. The cutting trolley is a robust construction with ease of access for consumable replacement and cleaning. The cutting head moves vertically on top of pipes and uses two sensor arms at each side of the cutting torch to keep a constant distance between the torch and material.

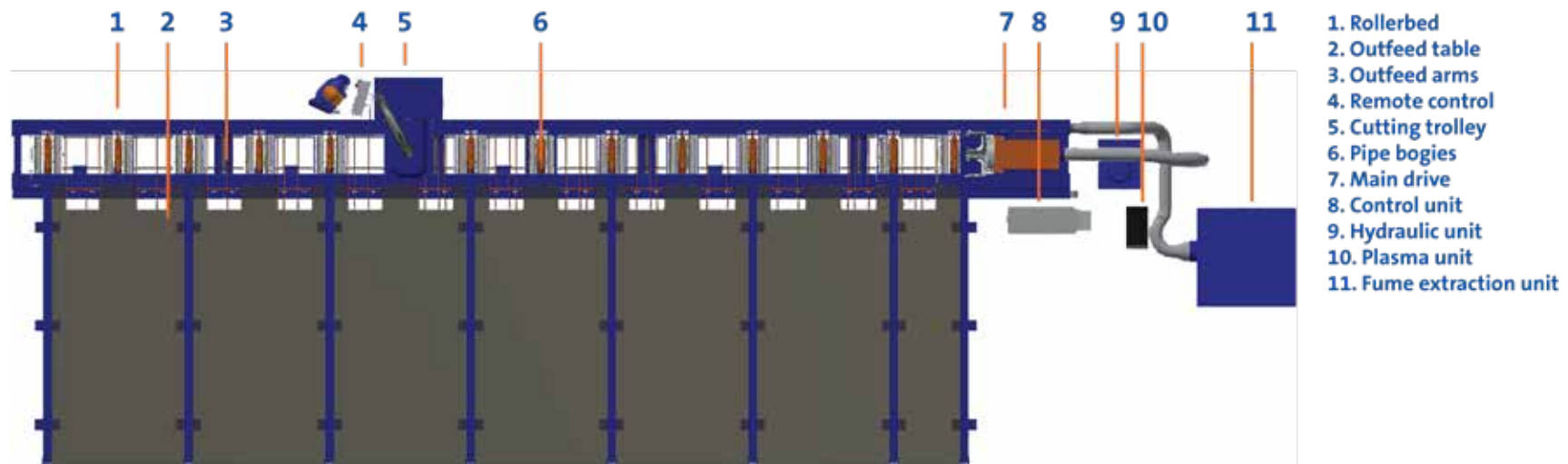
Pantograph

The cutting torch is attached to a pantograph that manipulates the torch position to perform straight cuts and bevels up to 45 degrees allowing for weld preparations on end cuts and intermediate cuts. The pantograph is a reliable and accurate positional manipulation of the torch that moves

smoothly and without disruption from other moving components.

Main drive

The main drive houses all components to make pipe rotation possible. The main drive contains a chuck with 3 jaws to clamp pipes from the in- or outside, depending on their size. Automatically centering the pipe on the roller bed removes the necessity for the operator to manually position the pipe. In combination with the roller bed, where each bogey can be moved up and down separately, the chuck can move vertically too, allowing oval and bent pipes to be cut with optimal accuracy as well. When a pipe is not perfectly straight and is rotated, longitudinal creep occurs. These forces



can be immense, but are mechanically absorbed by longitudinal chuck movement and communicated with the cutting trolley to keep the original position and accuracy intact.

Sideways outfeed table

After a cut is made, pipes are scooped out of the roller bed onto the outfeed table. The outfeed table consists of industry standard grids and has space for multiple pipes and allows operators to walk on top. The scoops keep pipes from rolling back onto the cutting bed and end stops at the end of the outfeed table keep pipes on the grids.

Control

The pipe cutting machine is controlled from the remote that is attached to the cutting trolley. The industrial touch screen is sensitive enough for gloves and can be adjusted to the operators preference. The remote gives you complete control over the machine with an intuitive and guiding interface.

Infeed logistics

Additional infeed logistics can be purchased to create a smoother workflow and improve production speeds even further.

Fume extraction

Double integrated fume extraction in the cutting head and through the

main drive create a clean cutting environment for operators and the fabrication floor. The fume extraction in the main drive contains a spark arrestor to protect the fume extraction unit from sparks and fire.

The power of plasma

Plasma cutting is a very effective way to cut various thickness of electrically conductive material. The unmatched speed and quality in combination with affordable prices give users an inexpensive process with quick results. At HGG, you can choose between two renowned plasma source providers to get the most competitive edge in plasma cutting equipment.

The standard plasma cutting process consists of creating an electrical channel of overheated ionized gas from the plasma torch through electrically conductive material. Through the material and a grounding clamp that connects back to the plasma cutter, a completed electric circuit is formed.

In most common setups this is accomplished by forcing a compressed gas through the nozzle at high speed. An electrical arc is created between an electrode and the material, creating a channel of plasma. The electricity delivers enough heat to melt through steel or other electrically conductive material, and simultaneously blow away molten material to realize a cut.



Additional infeed logistics



Sideways outfeed table

Accuracy

HGG has distinguished itself as a pioneer in CNC plasma cutting and keeps on improving to deliver optimal cutting results. The technology keeps improving and so do our machines. With the following compensations we help you acquire optimal accuracy in a quick process.

Shape compensation

Materials are usually not perfectly straight and round. They are usually bow shaped (like a banana) and have some ovality. The machine compensates for bow shaped pipes by individually lowering bogies. The ovality of pipes is compensated by two sensor arms that are positioned slightly lower than the end of the plasma torch, keeping the torch-to-material distance optimal.

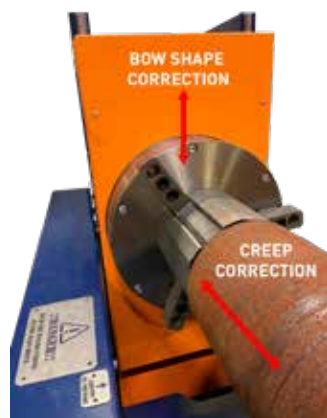
Main drive compensation

The main drive clamps pipes with its jaws and rotates them around. Though, when pipes are rotated on the bogies, they create longitudinal forces known as creep. Bow shaped pipes are also capable of exerting forces on the chuck of the main drive in vertical direction. Therefore the chuck can correct position vertically and can move longitudinally with the pipe and

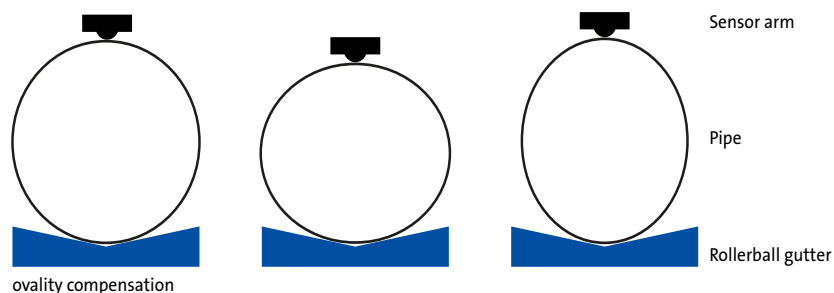
communicate this corrected position directly to the cutting trolley.

Plasma compensation

The characteristics of plasma have been studied intensely for multiple years, but in applying plasma to cut steel, there are some implications, that need to be compensated or optimized for higher preferred quality.

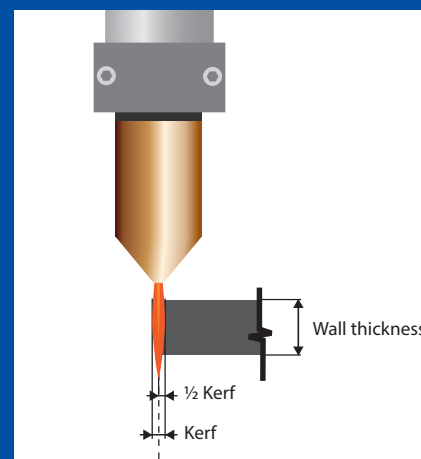


Main drive compensation



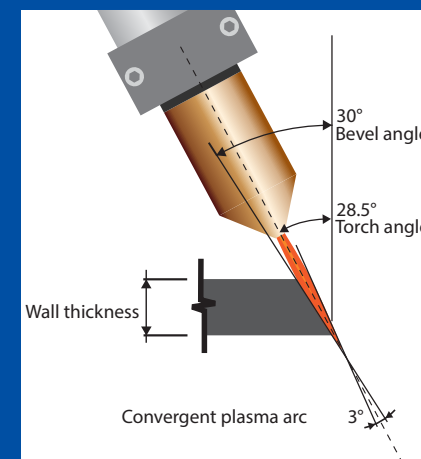
ovality compensation

HGG Plasma technology



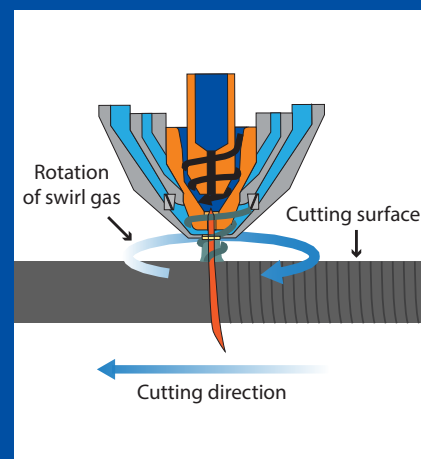
Kerf compensation

for perfect accuracy on all sides of a part, independent of the wall thickness. The compensation is usually half the kerf.



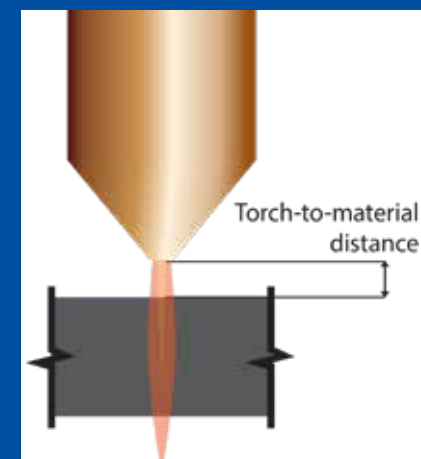
Arc shape compensation

for perfect straight and beveled cuts. The plasma arc cuts a convergent kerf which is corrected by changing the torch angle.



Optimized cutting direction

to deliver the good side of the arc to the part and the bad side to any remnant material increasing the accuracy of cuts.



Torch-to-material distance control

to maintain a constant distance that is perfect for plasma to keep the arc connected correctly.

Capabilities



The ProCutter 900 RB is a pipe cutting machine that offers consistency in production speed and high quality cuts, while taking in minimal floor space and reducing welding and fit-up times. This result can only be achieved by designing the machine with these goals in mind. The following points guarantee these capabilities.

Rigid frame

The frame under the machine is mechanically fastened to the floor and is required to be level for optimal quality. The frame is such a rigid construction that the machine can last for 15 years. An additional benefit of this frame is that there is enough clearance under the machine to clean with a broom and remove small scrap pieces.

Separated control unit

The control unit is placed behind the main drive, separately from the cutting trolley for easy access and less weight on the cutting trolley. The lower cutting trolley weight allows for higher accuracy and less power needed to move along the frame.

Logistics

To utilize the maximum production speed and logistic capability of a roller bed, additional infeed conveyors with passive loading area can be purchased. The added logistics can help operators store a full days work on the machine

beforehand and to process them all without bothering other processes. The infeed conveyors and outfeed tables allow picking and dropping by crane or forklift.

Outfeed table

The outfeed table has industry standard grids and has attached pipe barriers to protect operators and keep pipes from rolling over the shop floor. The outfeed table is sturdy enough to walk on top of and allows for cranes and forklifts to transport material from.



Rigid frame with clearance



Additional infeed logistics



Separated control unit



Outfeed table

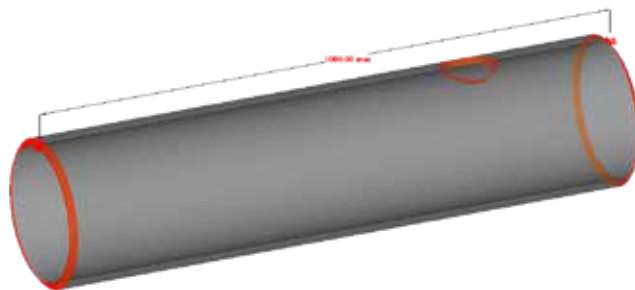
Productivity

Pipe profiling production is a time consuming practice when done manually. Most of the production time is dependant on correct measurements, the quality of the performed cut and the required rework after cutting. By eliminating manual measurements and directly going from 3D shapes to cutting, there is already a large portion of time saved. The cutting time doesn't differ a whole lot between manual cutting

and machine cutting, as it is mostly dependant on the plasma cutting current. However, the quality that CNC machines can achieve with plasma cutting is way higher than when cutting manually which results in less rework, less grinding time and less need for corrections later on in the construction. Below is a table for time comparison of different situations.

Clarification of differences

The moment of positioning for manual work is obsolete as you move it directly into the position during moving. Machines position material on their infeed conveyors or roller bed where they are centered. Moving takes place between the previous area in the workshop to where the cutting takes place. Measuring only needs to be done when cutting manually, as a machine does this fully automatic with the information in the 3D file. The cutting process is a little bit smoother when using CNC even more so with inexperienced cutters. Another area where you can save a lot of time is the grinding afterwards. Where manual cutting often needs to be grinded along the whole cut surface, HGG machines require almost no grinding.



Phase	Manual time	PC900 RB time
Positioning	0 sec	20 sec
Moving	180 sec	180 sec
Measuring	3600 sec	0 sec
Cutting	180 sec	160 sec
Grinding	600 sec	20 sec
Total	4560 sec	380 sec
In minutes	76 m	6 m 20 sec

Based on this sample pipe and a production of 200 pipes/month you save an estimated time

Savings per tube	60 minutes
Savings per month	200 hours
Savings per year	1400 hours

Based on 1 worker with an hourly rate of \$55 you save:

Per pipe	\$55,-
Per month	\$11.000,-
Per year	\$132.000,-

Health and safety

Working with high voltages, explosive gasses and heavy steel means that safety precautions are an absolute necessity. All HGG's profiling machines ensure that operator safety has the highest priority while taking operator comfort into consideration.

Controls

The machine is operated from a remote control with touch screen and physical buttons. This combination allows operators to use the machine in close proximity to the machine without being in danger. The controls and cutting area are positioned at an ergonomically comfortable height for operators.

Protection

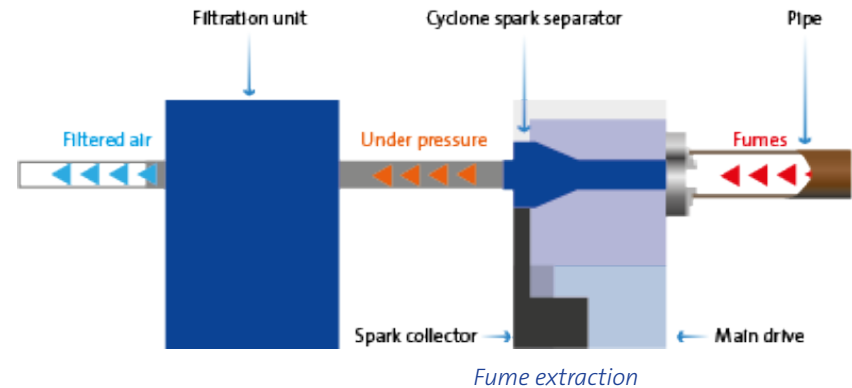
Plasma cutting is performed in a shielded compartment and the operator can see the cutting process when eyeing at being protected from radiation and sparks. Operators should always wear the recommended Personal Protection Equipmen (PPE).

Fume extraction

The fume extraction system is placed close to the cutting process to optimally extract fumes and sparks from two places. To filter particles from the plasma fumes, a filtration unit is recommended.

Guidelines

All HGG machines are provided with an instruction manual and grease schedule. The machines have stickers in plain view to show what equipment is advised and what the dangers of the machines are. Be sure to adhere to local safety guidelines as well.



Machine status light



Emergency stop button



Shielded compartment



Industry standard stickers

Label Printing

Material tracking is very useful for improving workflow speed and communication further downstream. Labeling provides a reliable, fast and cost effective method of tracking and communicates information in a consistent way.

Information

Labels can contain a variety of information that is useful in production to identify what part you are working with or what needs to happen with it further downstream. Information that you can print on the label consists of heat numbers, material specifications, customer, part ID's and custom fields amongst others. The information can be specified according to a label template beforehand. The data is retrieved from the properties panel in ProCAM, where the data can be adjusted and corrected if necessary.

Printing labels

Label printing can be done in two separate workflows. Either there is a printer at

work preparation and at the machine, or there's only one label printer at the machine. The label printer at the machine can be configured to print a label for the part that is finished, by reading this information from the cutting file or by manual data input. The label printer at work preparation can be configured to print stock labels which can be scanned by machine operators with a barcode/QR scanner to start with the correct files and eliminating paper.

Labels

The labels use a special adhesive that is optimized to stick to steel, even with corrosion and extreme temperatures. The data format is coherent to BIM and

STOCK NAME		HGG
Ømmmm x mmm		
L: xxxxx mm		
Ht: xxxxxxxx		
Mat: xxxxxxxx		
Client		

Stock label with QR code for the scanner

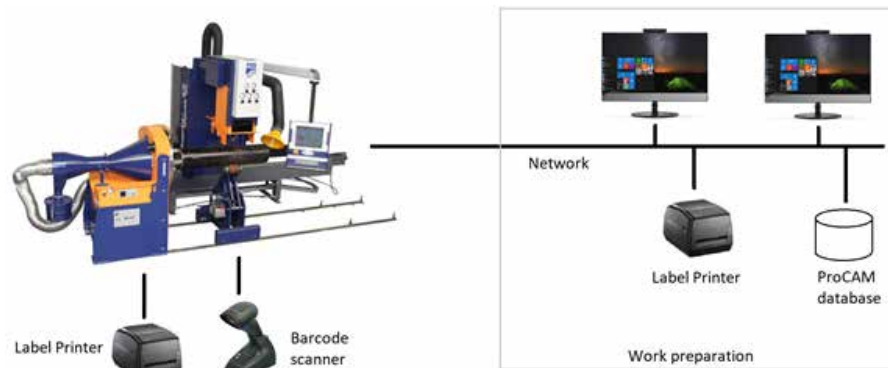
PART NAME		HGG
Ømmmm x mmm	L: xxxxx mm	
Group	Batch	
Ht: xxxxxxxx	Mat: xxxxxxxx	
Client	Projectnr	

Part label with part information

can be used downstream for location identification as well. Labels are available in two sizes that can be chosen to the companies preferences. Generally a smaller size is used for smaller parts and material and a larger size is used on bigger parts and material.

Scanner (optional)

Labels for stock material can be provided with a barcode or QR code. With a scanner at the remote control codes can be scanned and the correct cutting jobs are loaded from the ProCAM database automatically. Optimizing your workflow with labels and a scanner will speed up your production and reduce the risk of manual errors by selecting the wrong cutting file.



Overview of the hardware components used by label printing with scanner



Label printer in stand next to the machine

Advantages

- Track material throughout the cutting process and further downstream
- Cost effective method to track parts
- Fast workflow with printing and applying labels
- Automated label printing after scanning stock labels
- Work digitally and create a paperless workflow