

# EDGE MILLING TECHNOLOGY



**LINSINGER**

[WWW.LINSINGER.COM](http://WWW.LINSINGER.COM)

**#TRUSTTHEINVENTOR**



# ADVANCED TECHNOLOGY

LINSINGER, a global leader in milling and sawing technology, stands for enduring quality and outstanding productivity for over 80 years. Passion, hard work, personal commitment and dedication have played the primary role in the success of LINSINGER and the satisfaction of our customers. With an export quota of 98%, the company developed from a family business to an owner-run global player in the industry. Innovation plays another major role in the success of the company. That is why the Research and Development Department at LINSINGER is redefining the limits by collaborating with our clients to find the right solution for each project. We design and manufacture a machine exactly to the client's requirements.

## EDGE MILLING AS A GAME-CHANGER

For decades milling has been the core competence of LINSINGER. In the early 1950s, the first mounting unit on turning lathes for thread milling was developed, followed by a high-speed milling machine only several years later. Those are only two out of many patented inventions by LINSINGER. Needless to say, that our technology is innovative, precise and efficient. The tried and tested vertical copying peripheral milling technology is used in plate milling machines for a wide range of applications.

## APPLICATIONS



WIND TOWER



SHIPBUILDING



PIPE PRODUCTION



LARGE PIPE








BOILER END



NON-FERROUS



## WHY LINSINGER?

-  **Fast** – increased production rate due to simultaneous two-sided welding edge preparation
-  **Reliable** – highest quality ensures low maintenance
-  **Flexible** – any bevel profile can be milled through individual cutter heads in a single process
-  **Low running costs** – fast payback is guaranteed
-  **Exact** – strip waviness tracking function enables a consistent bevel profile

## LINSINGER TOOL TECHNOLOGY

### Monoblock Cutter Head

Circumferential peripheral milling of the plate edge



### Sandwich Cutter Head

Sandwich technology for flexible profile setups



**Examples** of possible plate edge forms:



**MACHINE &  
TOOL**

**FROM A  
SINGLE SOURCE**

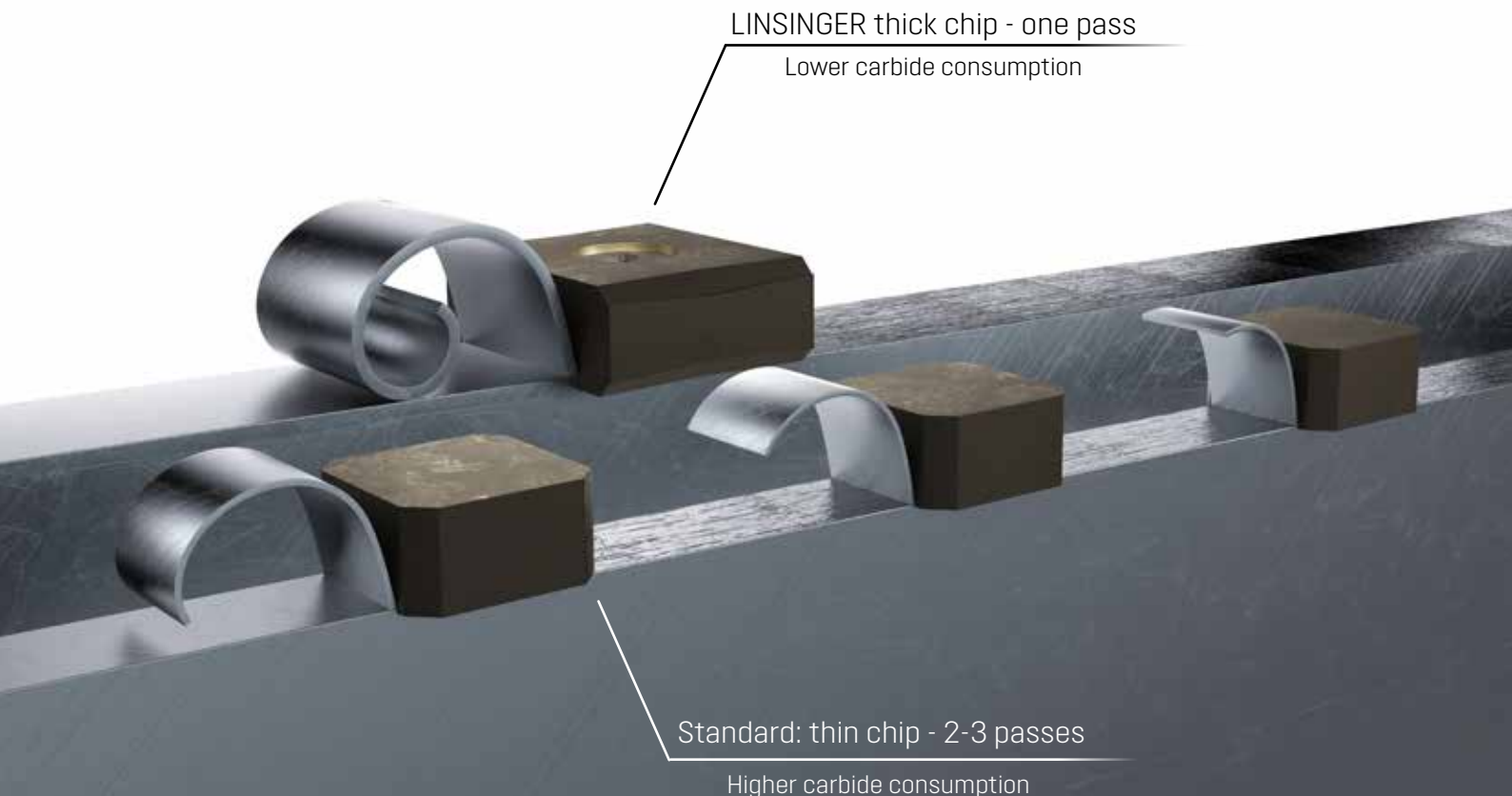


## WHY YOU SHOULD TRUST IN OUR MILLING TECHNOLOGY

- Perfect edge preparation in one milling pass
- Plate thickness up to 200 mm and more
- Tightest possible processing tolerances
- Fully automatic machine concepts
- Machining of duplex and superduplex grades
- No thermal impact on cutting surface
- Various edge milling profile types (N/V/X/Y/J) possible
- Wide-ranging machine configuration diversity for every customer application
- Easy chip removal by integrated chip conveyors - safer and cleaner
- Our proven "LINSINGER Thick Chip Milling Technology" ensures high feed and output rates at lowest possible tooling costs (reduced operational costs)
- Low vibration due to rigid machine design

## LINSINGER THICK CHIP MILLING TECHNOLOGY

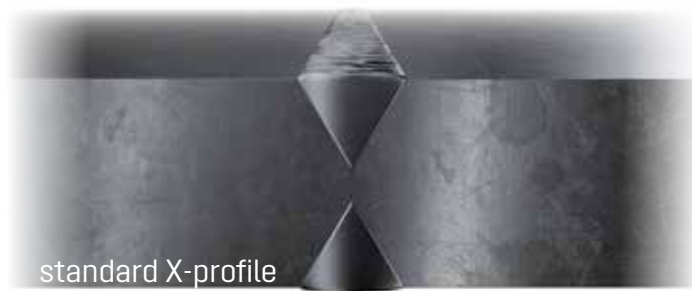
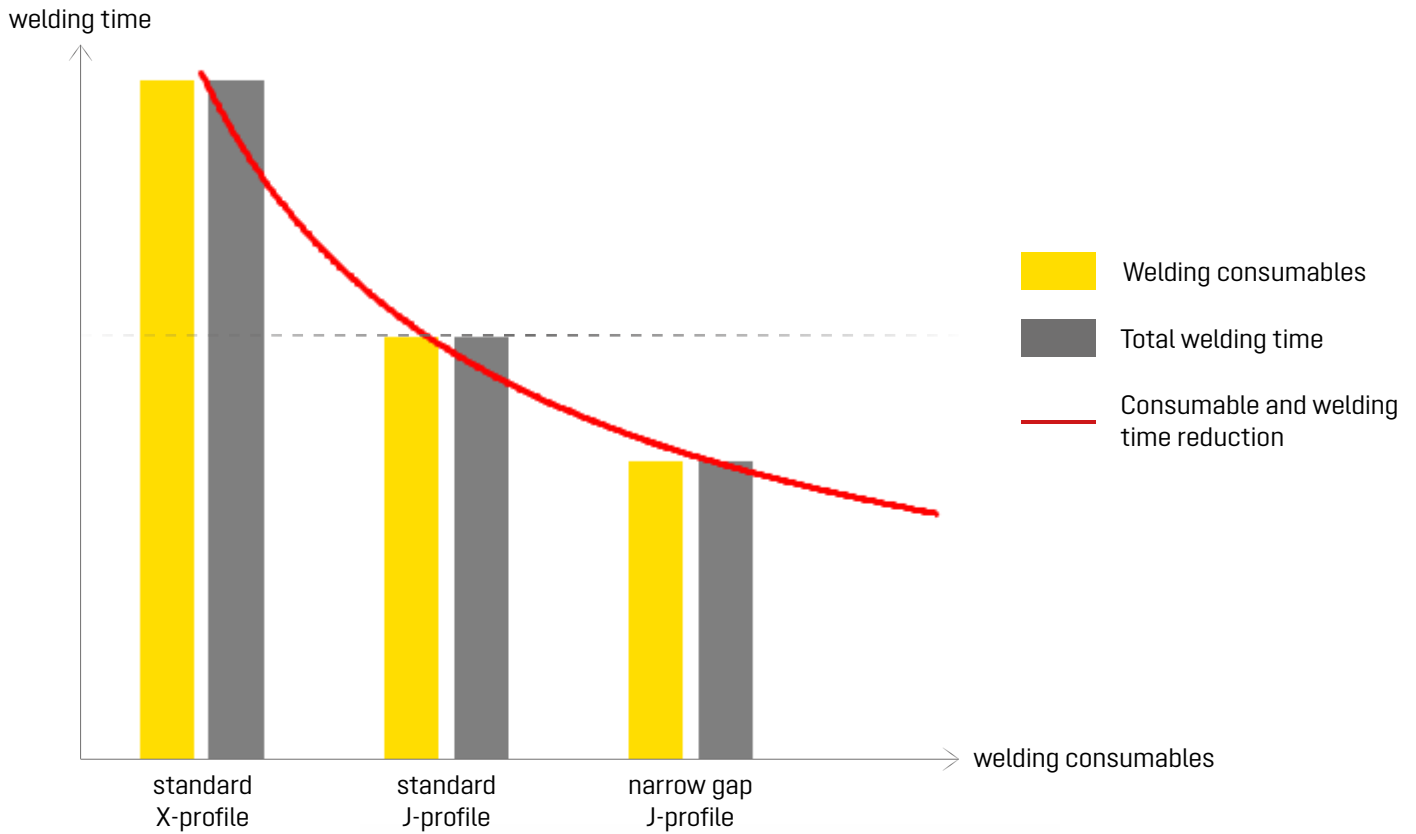
- All LINSINGER machines are designed for thick chip milling technology
- Built to withstand the larger forces from thick chips
- Low carbide consumption guarantees fast payback



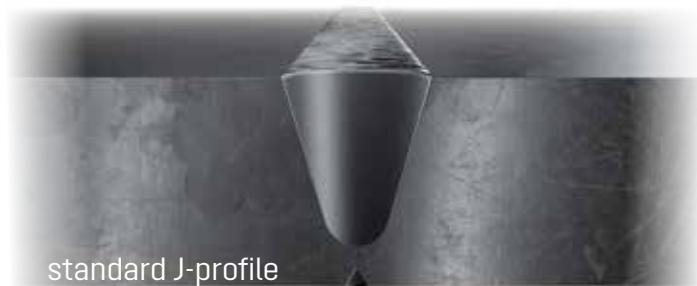


PERFECT MILLED  
EDGES IN ONE PASS

# WHY MILLED PROFILES SAVE MONEY AND TIME



Edge milling technology allows cost savings.



The reduction of welding joint volume minimizes the costs of consumables and increases production speed.

# WIND TOWER

## RELIABLE PLATE EDGE MILLING TECHNOLOGY

### TYPE PFM 90/600

- Worldwide fastest 4-side milling machine
- Developed for rectangular, trapezoidal and conical plates
- Perfect welding edge preparation for heavy plates
- Precise weld preparation on all 4 sides with 2 milling stations
- Reduced downtimes due to automatic tool changing device
- The proven height copying function ensures constant web flow along the plate edge

### FEATURES

- All 4 sides of a plate are machined in one clamping
- Automatic machine setup for each plate dimension
- Heavy rigid machine design
- Automatic tool changing

### TECHNICAL DATA

working range:  
max. 30,000 x 5,000 x 160 mm

connected power: 480 kW

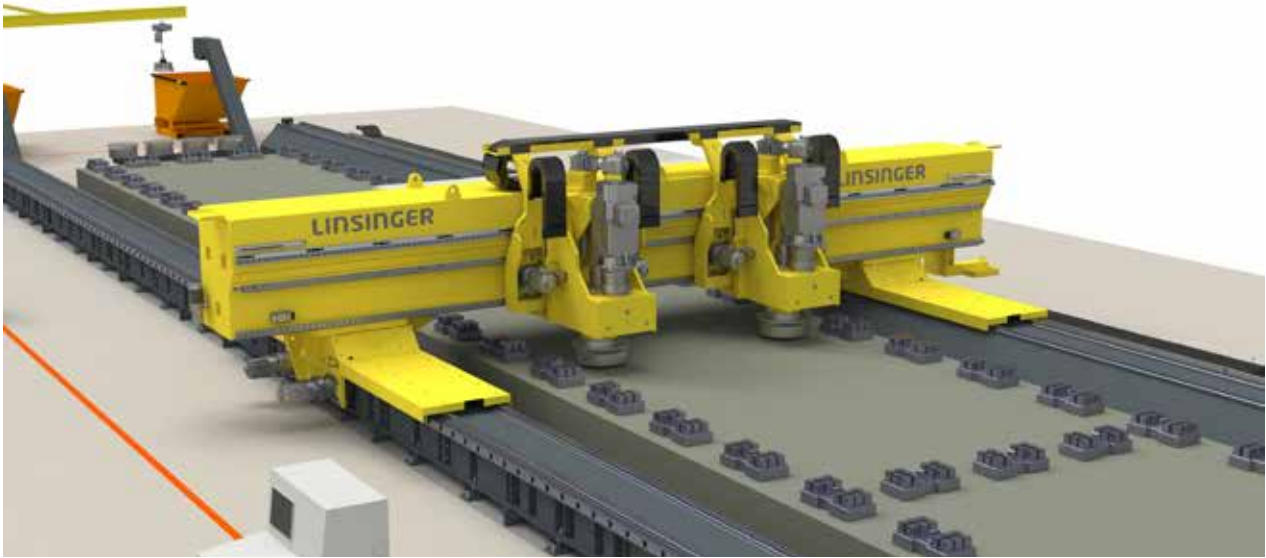
total weight: 404 t





# TYPE PFM FALCON

- PFM Falcon enables high precision edge preparation on all 4 edges
- The high-power reserves ensure maximum torque and high feed rates
- The proven copying function ensures a constant web flow along the plate edge, even on heavily bent plates of high thickness
- Highly flexible machine concept with plenty of configuration



## FEATURES

- All 4 sides of a plate are machined in one clamping
- Vibration damped machine bed
- Automatic tool changing
- Milling of rectangular, trapezoidal and conical plates
- Available with one or two milling units
- Reinforced linear guidance
- Backlash-free toothrack and pinion design

## TECHNICAL DATA

tool diameter: up to 600 mm  
plate length: from 6 to 50 m  
control system by Siemens



# SHIPBUILDING

## TAILOR-MADE MILLING MACHINES FOR SHIPYARDS

### PANEL LINE

- Automatic plate jointing for welding
- By combining the milling and the welding process the overall costs are reduced and the welding speed is increased
- Simultaneous milling of two plate edges with one cutter head
- Automatic plate aligning and transport system



### FEATURES

- Weld seam preparation with maximum accuracy facilitates laser hybrid welding
- Combined milling tool for tapping and welding profile milling
- Automatic attaching of welding taps



### TECHNICAL DATA

- total weight: 760 t
- milling power: 75 kW
- milling speed: 10 m/min
- max. sheet thickness: 25.4 mm
- welding of panel sizes: up to 30 m x 36 m
- milling of panel size: up to 32 m x 3.2 m

## HATCH MILLING MACHINE

- Mobile 5-axis processing unit for submarine hatch milling
- Flexible and mobile: processing on shop floor or directly on submarine corpus
- Drilling, milling, boring, flame cutting, measuring possible with one machine
- Quick-change mechanism for the replacement of tool heads

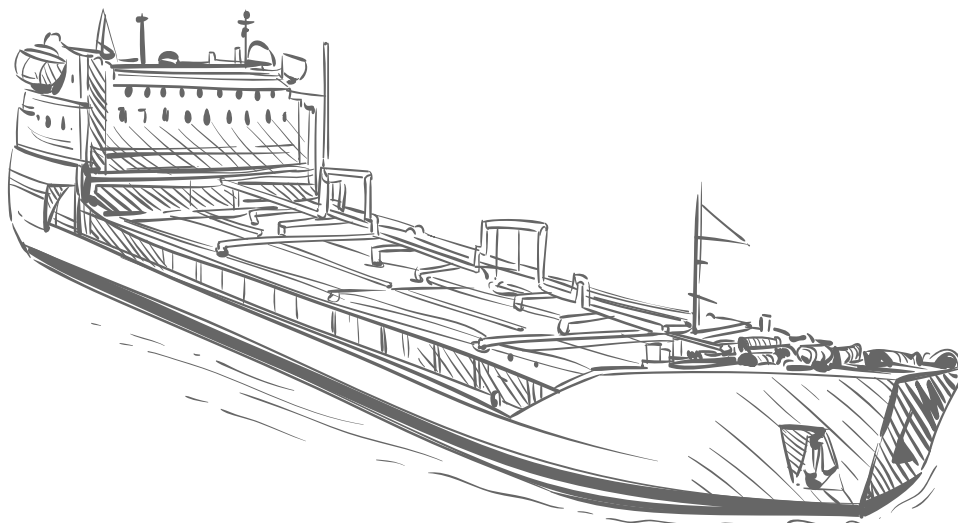


## SPHERICAL MILLING MACHINE

- For processing ball tank segments of LNG vessels
- All 4 plate sides are precisely processed through one-off clamping on the rotatable clamping table
- Consistent profile across the entire plate edge through 3D copying milling unit
- Integrated automatic tool changer

## PROFILE MILLING MACHINE

- For processing ship „stiffening“ profiles
- Exact weld seam preparation
- Applicable for all common profile types like bulb profiles, T-profiles, angles and flats





# TUBE & PIPE

## APPLICATION: SSAW & ERW

### TYPE BFMK

#### SPIRAL TUBE LINES SSAW

- Milling unit with vertical copying and profile milling tools for accurate plate edge profiles
- Material savings through reduced kerf
- High line speeds possible during tack welding due to double milling units
- Small chips which are easy to handle



#### LONGITUDIAL TUBE LINES ERW

- Maximum accuracy weld seam preparation
- Vertical and transverse copying milling units with profile processing
- High cutting performance with low tooling costs
- N and V profiles or profile milling tools possible
- No additional deburring required



#### TECHNICAL DATA For spiral tube lines

line speed: up to 12 m/min

strip thickness: up to 25.4 mm

#### For longitudinal tube lines

line speed: up to 80 m/min

strip thickness: up to 25.4 mm





## APPLICATION: LSAW

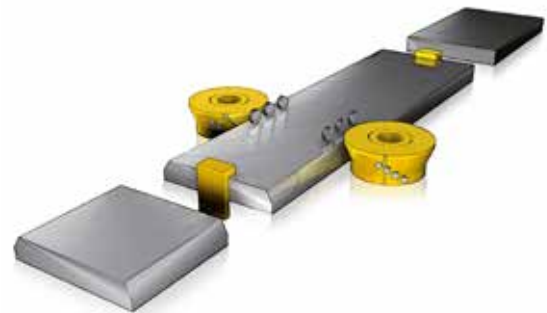
## TYPE PFM

### LONGITUDINAL LINES LSAW

- For manufacturing of large pipes
- Simultaneous edge preparation on both longitudinal sides
- Applicable for carbon steel, stainless steel, duplex and super duplex

### FEATURES

- High productivity through simultaneous milling on both longitudinal sides
- Weld seam preparation with maximum accuracy
- Vertical copying milling units with profile milling tools
- Increased output through precise weld seam preparation

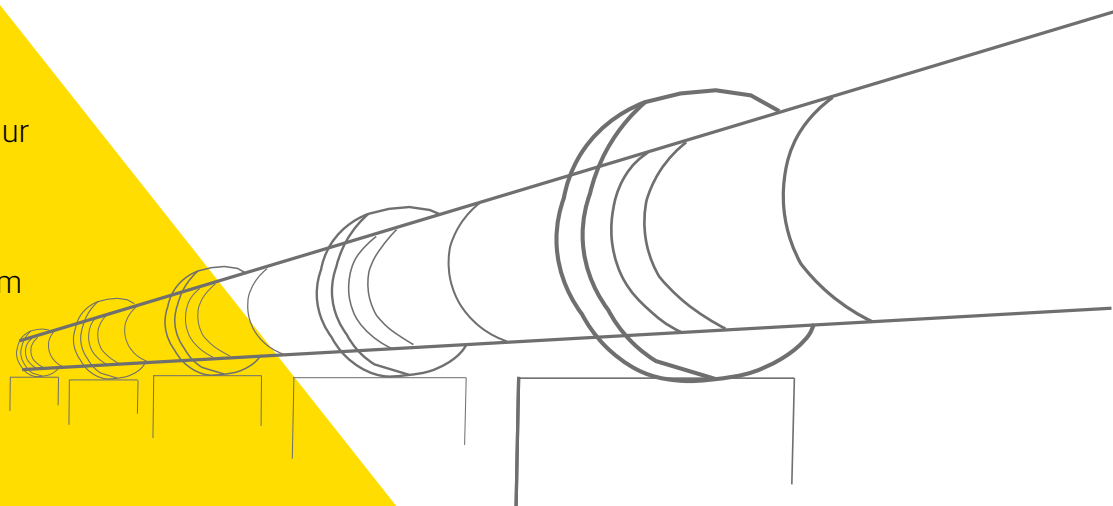


### TECHNICAL DATA

output: 20-30 plates per hour

working range: 12.7 x 4.8 m

plate thickness: up to 50 mm



# VESSELS & BOILER END

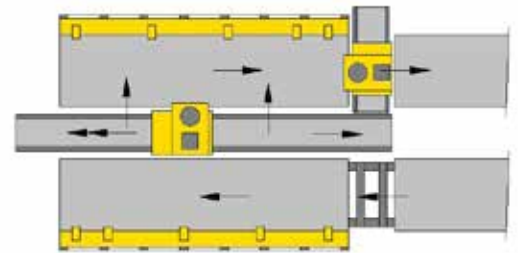
## UNIQUE & INNOVATIVE MACHINES

### PFM LQ

- For the preparation of welded edge profiles on all sides
- Applicable for ship industry and shipyards

#### FEATURES

- Maximum accuracy weld seam preparation
- Vertical copying milling units with weld profile milling tools
- Transverse transport between the two clamping tables enables edge preparation
- Crane manipulation
- Increased quality through high-precision plate tolerances

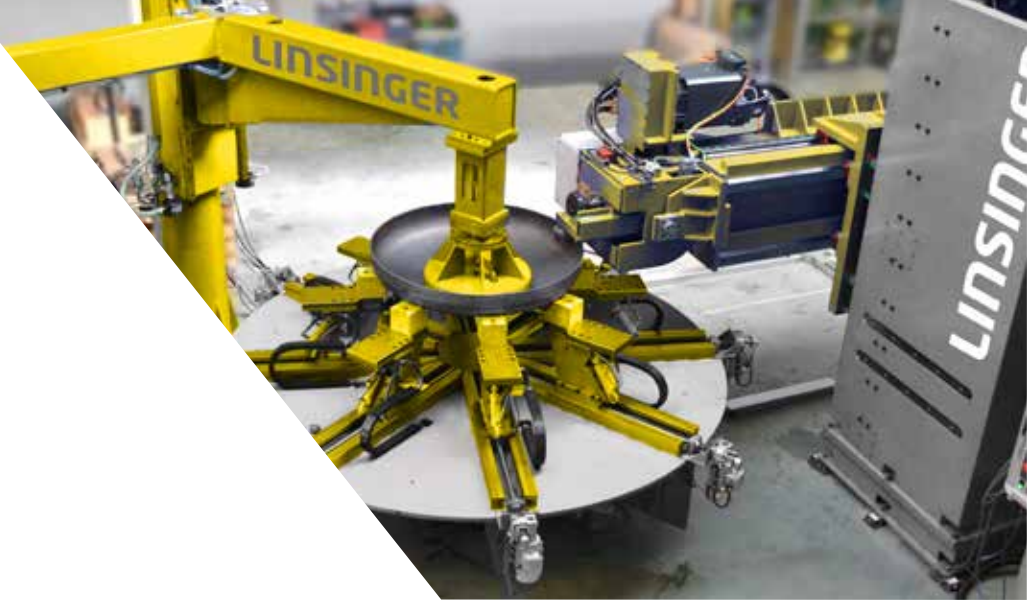


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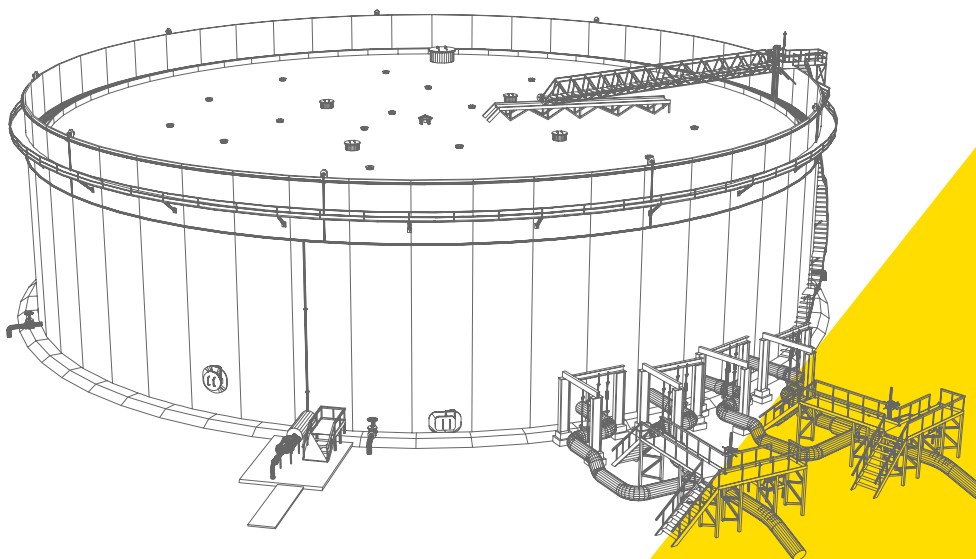


## AUTOMATIC BOILER END BEVELLING MACHINE - ORBIT

- It is the world's first fully automatic boiler end bevelling line
- Optional minimum quantity lubricant spray nozzles ensure economic machining of stainless steel and high alloyed materials
- Due to the special angle head, individual profiles and geometries can be milled with one cutter head
- After loading via an inlet conveyor, the boiler ends or cups are automatically transported into the machining area, where the chamfering cycle takes place. After machining, the heads are automatically discharged and ready for further transport

### FEATURES

- Fully automatic machining cycle
- High bevelling performance
- Easy machine setup for every diameter
- Automatic and precise alignment of boiler ends
- Precise and fast welded seam preparation
- Various kinds of profiles available (V/X/Y/J...)
- Automatic tool changer function available



### TECHNICAL DATA

diameter range:  
from 100 up to 7,000 mm

wall thickness:  
from 6 to 60 mm

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# ADVANCED TECHNOLOGY

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-  **Reliable** – highest quality ensures low maintenance
-  **Flexible** – any bevel profile through individual cutter heads in a single process.
-  **Low running costs** – the payback is less than 3 years due to very low material removal.
-  **Exact** – strip waviness tracking function ensuring consistent bevel profile.

### Cutter Head -

Peripheral milling of the plate edge for welding seam preparation.



**Monoblock cutter head**



Examples of possible edge forms for plate edge milling machines:



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## APPLICATIONS



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SHIPBUILDING



BIG PIPE



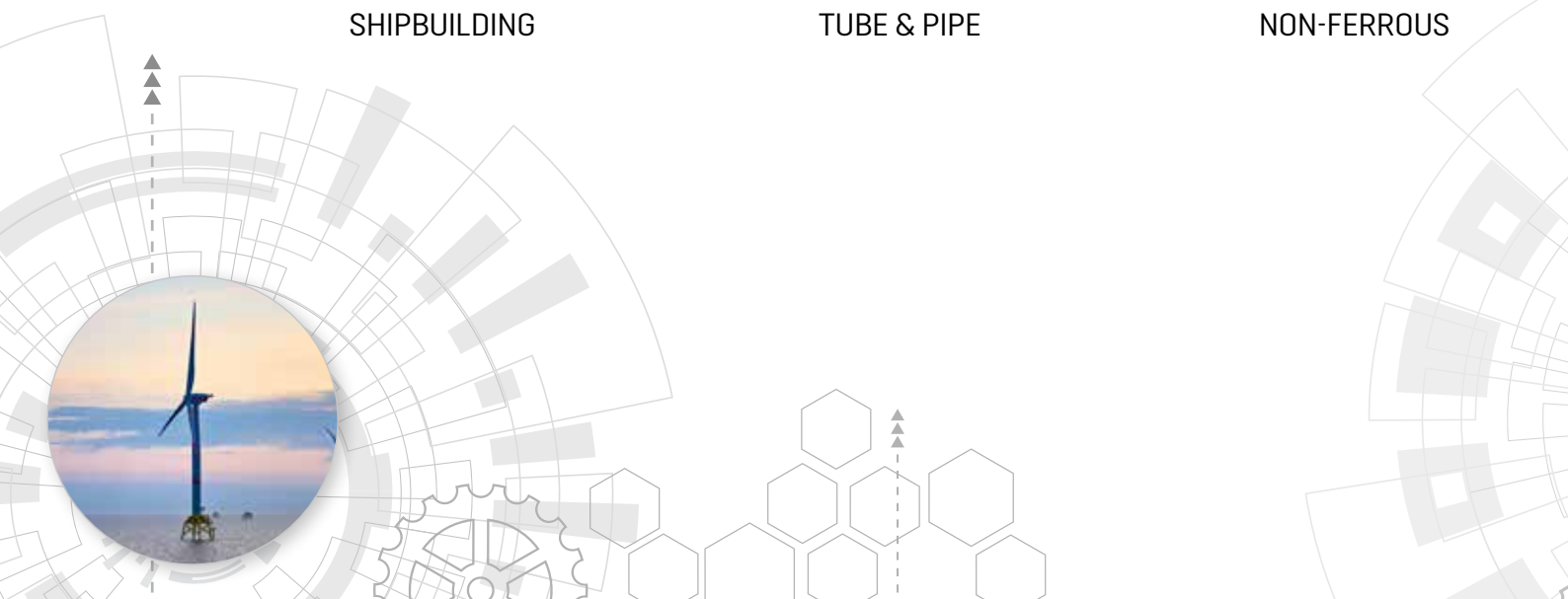
TUBE & PIPE



BOILER END



NON-FERROUS



# MILLING CONTENT

04

ADVANCED TECHNOLOGY

04



# BIG PIPE

## PFM FALCON 4-SIDE PLATE EDGE MILLING MACHINE

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### TECHNICAL DATA

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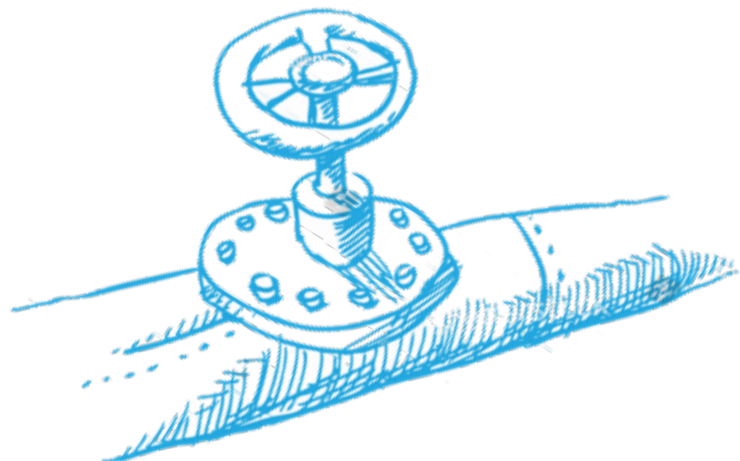
Connectivity power:  
Total weight: 760 t  
Milling power: 75 kW  
Milling speed: 10m /min  
Max. sheet thickness: 25.4 mm  
Welding of panel sizes: up to 30 m x 36 m  
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# WELDING SEAM MILLING MACHINE






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- Low heavy and rigid vibration due to machine design

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