



RAIL TECHNOLOGY

INNOVATION, TECHNOLOGY
AND HIGHEST PRODUCTIVITY



**SINCE 1959
WE SUCCEEDED
WHERE OTHERS FAIL**

#TRUSTTHEINVENTOR

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WHO IS LINSINGER?

THE INVENTOR OF RAIL MILLING

LINSINGER Maschinenbau is a globally leading technology company with an 85-year tradition and 65 years of experience in the development, manufacturing and operation of rail milling technology. As pioneers in special-purpose machinery, we excel across numerous disciplines including automotive, offshore wind tower, shipbuilding, forging, tube & pipe mills. However, the railway sector is one of our main focuses.



> 15,000 m²
Production area



> 500
Employees



> 70
Sold rail milling
trains worldwide

OUR BUSINESS AREAS



Rail Maintenance



Sawing & Milling



Tool Technology

RAIL DEFECTS - OVERLOOK

Railway companies are the silent cornerstone of our civilization, a key for efficient transportation, crucial for the mobility transition and a carbon neutral world. But this essential part of society is facing numerous challenges, whereby one severe problem is the wheel-rail contact and the resulting rail defects such as:

TRANSVERSE PROFILE



LONGITUDINAL PROFILE



RCF – ROLLING CONTACT FATIGUE



CHALLENGES OF RAILWAYS

INCREASING DEMANDS

Increasing freight and passenger traffic,
resulting in increasing weight, frequency and wear

CLIMATE CHANGE

Measures,
regulations
and laws that
come with it

RAIL DEFECTS

- Safety risk
- Downtime - high failure costs
- Noise pollution
- Reduced service life of rail
- Increased carbon footprint

**LINSINGER
TECHNOLOGY
THE SOLUTION**

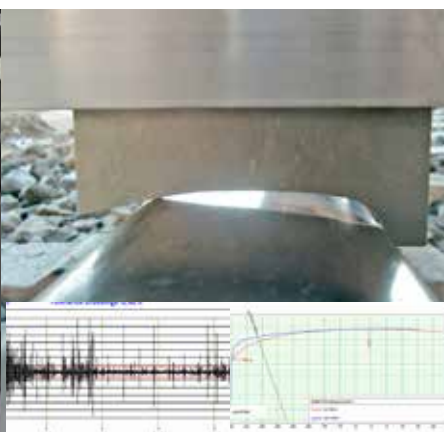


LINSINGER RAIL MILLING PROCESS



1. INSPECT

Check track for defects – where & what



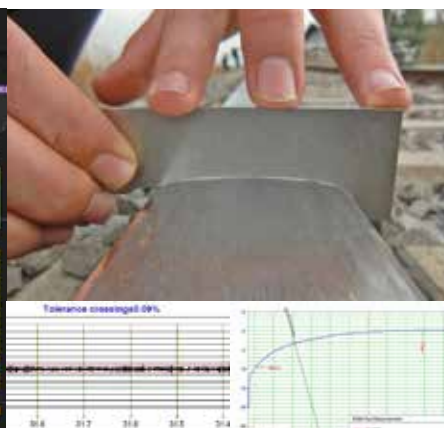
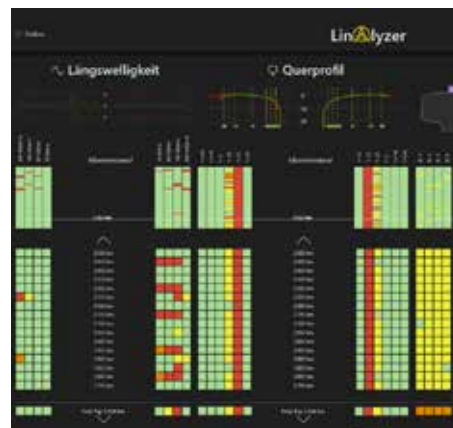
2. MEASURE

Pre-measurement with measuring system



3. MILLING

Remove the defects by patented circumferential milling process



4. FINISHING

Finish the milled surface using a finishing unit or our LINSINGER Smart Surface Technology.



5. REPORT

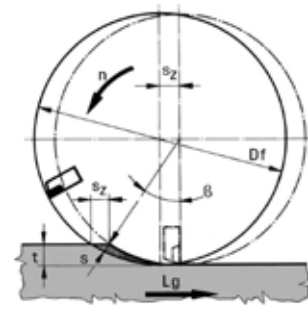
Re-measurement result, to check the removal of defects & other factors

HOW DOES IT WORK?

1. MILLING

The cutter head is equipped with carbide tips arranged to match the required transverse profile. The material removal during circumferential milling is adjusted according to the depth of the defect.

A defect-free surface is achieved with one pass.



**0.1 - 6 mm
in one pass**

2. FINISHING

Right after the milling process, the finishing process follows in order to smooth out the milled surface. The result is a quieter rail with low surface roughness.

1. MILLING

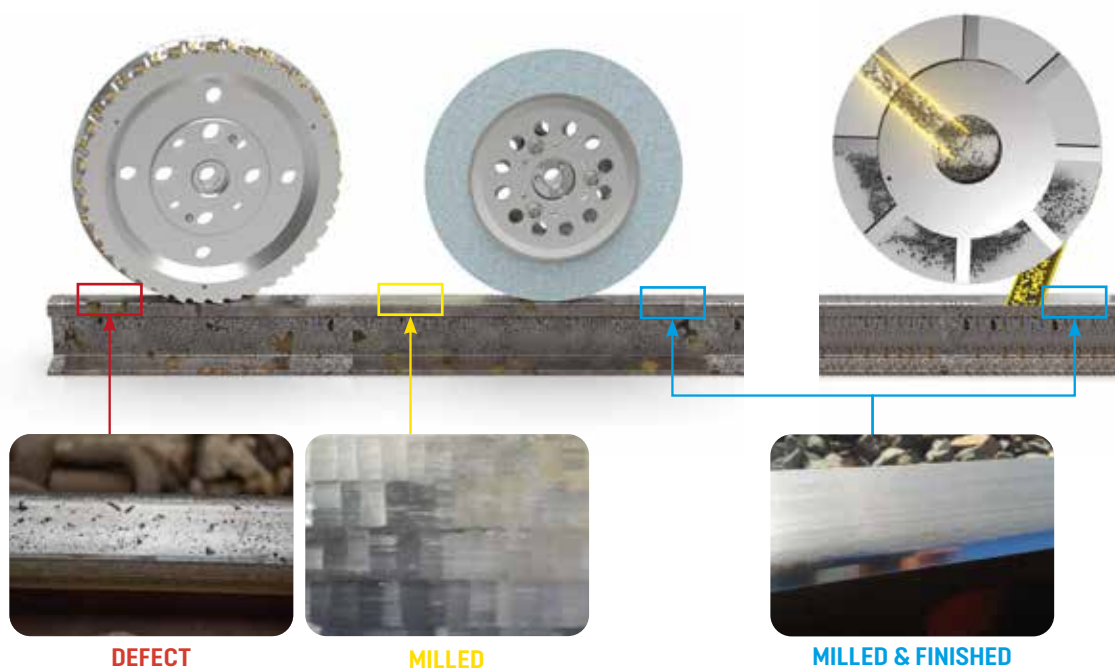
2. FINISHING

NEW

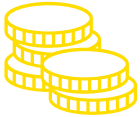
- Polishing

or

- LINSINGER
Smart Surface
Technology (LSST)



MAXIMIZING THE RAIL LIFESPAN BY LINSINGER TECHNOLOGY MEANS



MAXIMAL PROFIT & LESS STRESS

Thanks to the LINSINGER Technology, the rail lifespan is prolonged significantly. Only a fraction of the required maintenance shifts is needed in order to achieve the best outcomes. Along the way you benefit from additional savings by recycling metal chips and consumables.



MAXIMAL CO₂ SAVINGS & NO HEALTH THREAT

By maximizing the rail life, less steel is required for new rails. That is the biggest saving in CO₂. By recycling metal chips and consumables, we contribute to a positive CO₂ balance as well. No water is needed, there is no toxic dust and no sparks. So, health will never be jeopardized.



MAXIMAL SAFETY & COMFORT

Accurate reprofiling and defect removal ensures safety, comfort and low noise. Simultaneously, it maximizes the rail lifespan.





MOBILE SOLUTIONS



RAILMASTER® THE MODULAR SOLUTION



APPLICATION:

High-speed lines, main lines

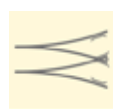
ADVANTAGES

- Modular Design - Future technologies easily adaptable
- Variable energy supply concept - Two independent power sources - powered by a pantograph, hydrogen, diesel or battery
- High Productivity - Cutterhead and rail profile changes on the fly
- Available measurement systems before & after processing
- Onboard operation without track entry
- Traction Optimization – Travel drive & working drive on separate axles
- Elimination of high-pressure hydraulics
- Prepared for "Robot-Milling"

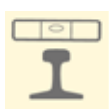
RAILMASTER®

Our newest development:
The most productive
rail milling train
in the world

POSSIBLE OPTIONS



processing of
switches



transverse
profile
measuring
device



longitudinal
profile
measuring
device



height
measuring
device



surface crack
detection



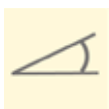
gauge
measurement



anomaly
detection



longitudinal
profile



superelevation



quality
index



acoustic
roughness



TECHNICAL SPECIFICATIONS

Type of drive of the processing units (milling/finishing)	electric
Traction drive	electric
Max. axle load	20 t
Removal per pass	0.1 - 6 mm
Roughness after processing	< 5 µm
Processing speed (feed)	Up to 2000 m/h
Speed towed	max. 120 km/h
Speed self-propelled pantograph	max. 120 km/h
Speed self-propelled other drives	max. 100 km/h
Length/Height/Width	65/4.2/2.6 m





RAIL MILLING TRAIN MG31 FOR LARGE WORKLOADS

APPLICATION:

High-speed lines, main lines

ADVANTAGES

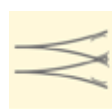
- Fastest processing thanks to newly developed milling units
- Large material removal possible with coarse rail defects
- Automatic tool change for long consistent adaption
- Transfer speed up to 100 km/h
- Long service life of the tools
- Continuously accessible
- Integrated measuring system
- Robust construction



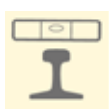
MG 31

Highly efficient
rail milling train

POSSIBLE OPTIONS



processing of
switches



transverse
profile
measuring
device



longitudinal
profile
measuring
device



height
measuring
device



surface crack
detection



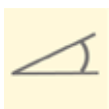
gauge
measurement



anomaly
detection



longitudinal
profile



superelevation



quality
index



acoustic
roughness



TECHNICAL SPECIFICATIONS

Drive type of units	three milling units per side: electric / one finishing unit: electric
Traction drive	hydraulic
Main engine	895 kW
Weight / max. axle load	205 t / per axle max.19.5 t
Gauge	according to customer requirement
Minimal curve radius for processing at gauge system 1,435 mm	150 m
Superelevation at gauge system 1,435 mm	180 mm
Chip container volume	11 m³
Maximum speed self-propelled	100 km/h
Max. gradient	40 ‰
Variable gauge	no

Driver’s cab 1 Aggregate room Tool magazine Engine room Suction device Chip container Crew room Technique room Driver’s cab 2





RAIL MILLING TRAIN SF06-FFS PLUS FOR LARGE WORKLOADS

APPLICATION

Main lines

ADVANTAGES

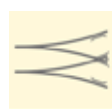
- Continuous operation through autonomous systems
- Customer-specific design and arrangements
- Support trailer with office space and social area
- High transfer speeds
- Modular configuration
- Capacity for extension
- Cabin to cabin gangway
- Machine integrated measuring device



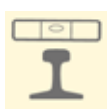
SF06-FFS

Highly autonomous
rail milling train

POSSIBLE OPTIONS



processing of
switches



transverse
profile
measuring
device



longitudinal
profile
measuring
device



height
measuring
device



surface crack
detection



gauge
measurement



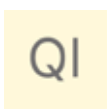
anomaly
detection



longitudinal
profile



superelevation



quality
index



acoustic
roughness



TECHNICAL SPECIFICATIONS

Drive type of units	two milling units per side: electric / one finishing unit: electric
Traction drive	hydraulic
Main engine	750 kW
Weight / max. axle load	164 t / per axle max. 22.5 t
Gauge	according to customer requirement
Minimal curve radius for processing at gauge system 1,435 mm	150 m
Cant at gauge system 1,435 mm	180 mm
Chip container volume	15 m³
Max. speed self-propelled	80 km/h
Max. gradient	40 ‰
Variable gauge	no





RAIL MILLING TRAIN SF03-FFS THE STANDARD MACHINE FOR ALL RAILWAYS

APPLICATION

Universally applicable, customised vehicle design

ADVANTAGES

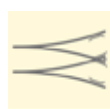
- Deutsche Bahn-proven and approved
- High efficiency
- Continuous operation through autonomous systems
- Suitable for high-speed lines
- High planning reliability
- Customer specific design
- Modular configuration
- Machine integrated measuring system
- Expansion capacity



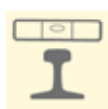
SF03-FFS

The most proven
rail milling train
in the world

POSSIBLE OPTIONS



processing of
switches



transverse
profile
measuring
device



longitudinal
profile
measuring
device



height
measuring
device



surface crack
detection



gauge
measurement



longitudinal
profile



superelevation



quality
index

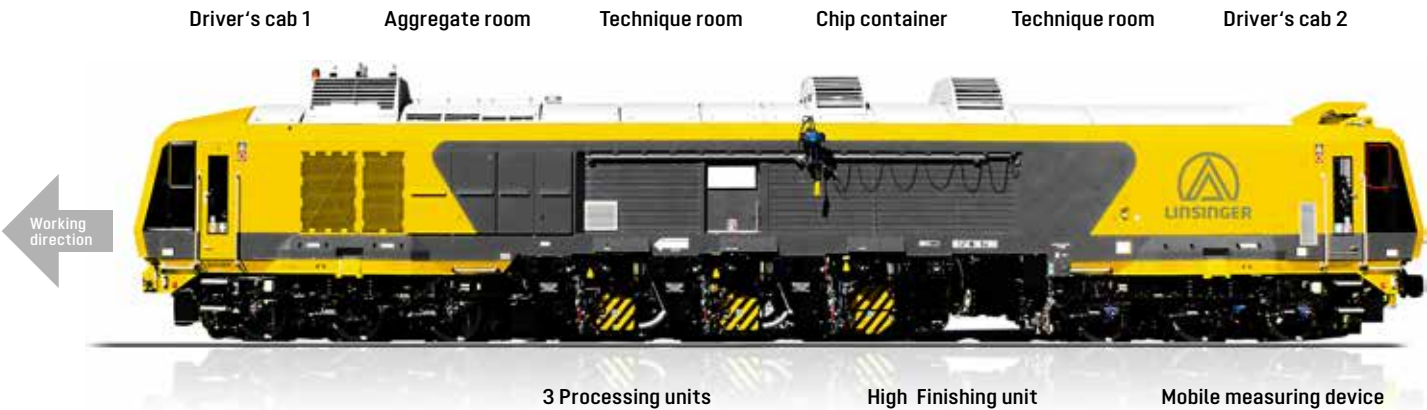


acoustic
roughness

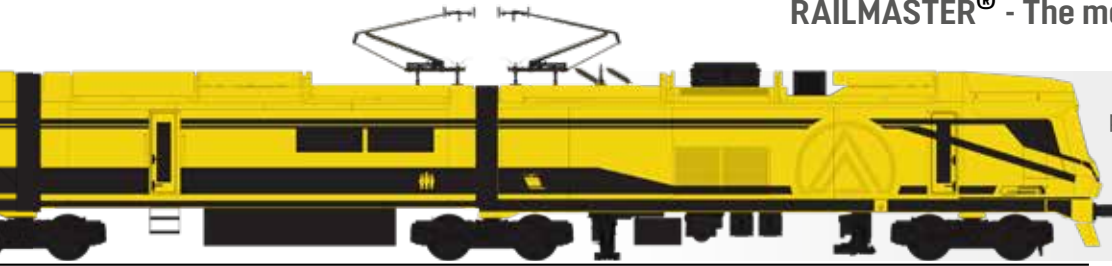


TECHNICAL SPECIFICATIONS

Drive type of units	two milling units per side: electrical / one finishing unit: electrical
Traction drive	hydraulic
Main engine	750 kW
Weight / max. axle load	119 t / per axle max. 20.5 t
Gauge	according to customer requirement
Minimal curve radius for processing at gauge system 1,435 mm	150 m
Cant at gauge system 1,435 mm	180 mm
Chip container volume	6 m³
Max. speed self-propelled	100 km/h
Max. gradient	40 ‰
Variable gauge	no







RAILMASTER® - The most productive rail milling train in the world

- processing speed up to 2000 m/h
- removal rate per pass 0.1 - 6 mm
- total length 65 m
- height 4.2 m / width 2.6 m



MG31 - Highly efficient rail milling train

- processing speed up to 2000 m/h
- removal rate per pass 0.1 - 6 mm
- total length 48 m
- height 3.9 m / width 2.6 m



SF06-FFS Plus - Highest performance requirement in long-term use

- processing speed up to 2000 m/h
- max. removal rate per pass 0.1 - 4 mm
- total length 44 m
- height 4.2 m / width 3.3 m

SF03-FFS - Universally applicable, equipped for any challenge

- processing speed up to 2000 m/h
- max. removal rate per pass 0.1 - 4 mm
- total length 24 m
- height 4.2 m / width 3.3 m

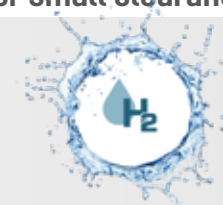
SF02T-FS - The train for special demands

- processing speed up to 1000 m/h
- max. removal rate per pass 0.1 - 1.5 mm
- total length 24 m
- height 3.50 m / width 2.60 m

SF02-TRUCK - Highest flexibility and maximum mobility

- processing speed up to 600 m/h
- max. removal rate per pass 0.1 - 1 mm
- total length 18.45 m
- height 3.5 m / width 2.55 m

MG11 - Especially designed for small clearance gauges - alternative drives available



- processing speed up to 720 m/h
- max. removal rate per pass 0.1 - 1.2 mm
- total length 11.29 m
- height 2.85 m / width 2.21 m



RAIL MILLING TRAIN SF02T-FS FOR SPECIAL DEMANDS

APPLICATION

Metros, tunnels

ADVANTAGES

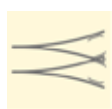
- For small clearance profiles
- Processing of tight curves
- Gauge convertible
- Low axle load
- Dust and spark reduced processing
- No additional track cleaning works
- Customised design
- Modular configuration
- Integrated measuring system
- Suitable for narrow gauge



SF02T-FS

Highly versatile
rail milling train

POSSIBLE OPTIONS



processing of
switches



transverse
profile
measuring
device



longitudinal
profile
measuring
device



height
measuring
device



surface crack
detection



gauge
measurement



longitudinal
profile



superelevation



quality
index



acoustic
roughness



TECHNICAL SPECIFICATIONS

Drive type of units	one milling unit per side: hydraulic / one finishing unit: electric
Traction drive	hydraulic
Main engine	470 kW
Weight / max. axle load	82 t / max. axle load 16 t
Gauge	Customised from 1.067 - 1.676 mm possible
Minimal curve radius for processing at gauge system 1,435 mm	45 m
Cant at gauge system 1,435 mm	160 mm
Chip container volume	4.5 m³
Max. speed self-propelled	60 km/h
Max. gradient	45 ‰
Variable gauge	yes

Driver's cab 1

Chip container

Suction device

Aggregate room

Driver's cab 2





RAIL-ROAD-TRUCK SF02-FS TRUCK FOR FLEXIBLE DEMANDS

APPLICATION

Road & rail, easy re-railing and transfer

ADVANTAGES

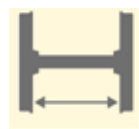
- Highest flexibility, maximum mobility
- No impact on rail traffic
- Transfer trips on roads and rail
- Simple re-railing
- No removal of track switching devices
- Short set-up times
- Suitable for processing grooved rails
- No damage caused by flying sparks on parked cars
- Quick transfer for processing hot spots
- For track processing on wooden bridges



SF02-FS TRUCK

Highly flexible
rail milling train

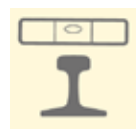
POSSIBLE OPTIONS



gauge
convertible



processing of
grooved rails



transverse
profile
measuring
device

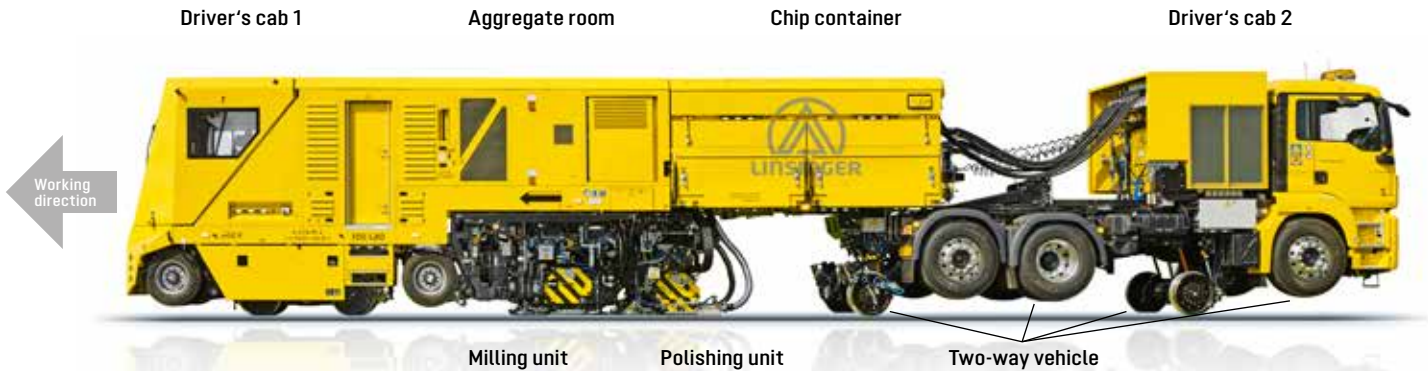


height
measuring
device



TECHNICAL SPECIFICATIONS

Drive type of units	one milling unit per side: hydraulic / one finishing unit: electric
Traction drive	hydraulic
Main engine	375 kW
Weight / max. axle load	ca. 47 t / max. 14 t axle load
Gauge	Customised from 1.000 - 1.668 mm possible
Minimal curve radius for processing at gauge system 1,435 mm	45 m
Cant at gauge system 1,435 mm	160 mm
Chip container volume	4,5 m³
Max. speed self-propelled	80 km/h road trip, 45 km/h rail trip
Max. gradient	40 ‰
Variable gauge	yes





RAIL MILLING TRAIN MG11 FOR SMALL CLEARANCE GAUGES

CARBON FREE OPTION
H₂ DRIVE



APPLICATION

Metros, light rails, trams

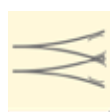
ADVANTAGES

- Diesel electric drive
- Highly efficient suction system for chips (> 99.5%)
- Processing of the rail head by circumferential milling with combined circumferential grinding
- Emission standard: EPA TIER 4 Final. EU Stage IV
- Transport in a 40 ft shipping container or road haulage on a specific flatbed truck possible
- Low noise emission during processing
- No cooling agents needed
- Driving cab for 2 persons; machine operator position for 1 person
- Suitable for switches and turnouts
- Front access

MG 11

The smallest
rail milling train
in the world

POSSIBLE OPTIONS



processing
of switches



processing of
grooved rails



longitudinal
profile
measuring
device



height
measuring
device



transverse
profile
measuring
device



gauge
measurement



longitudinal
profile



superelevation



quality
index

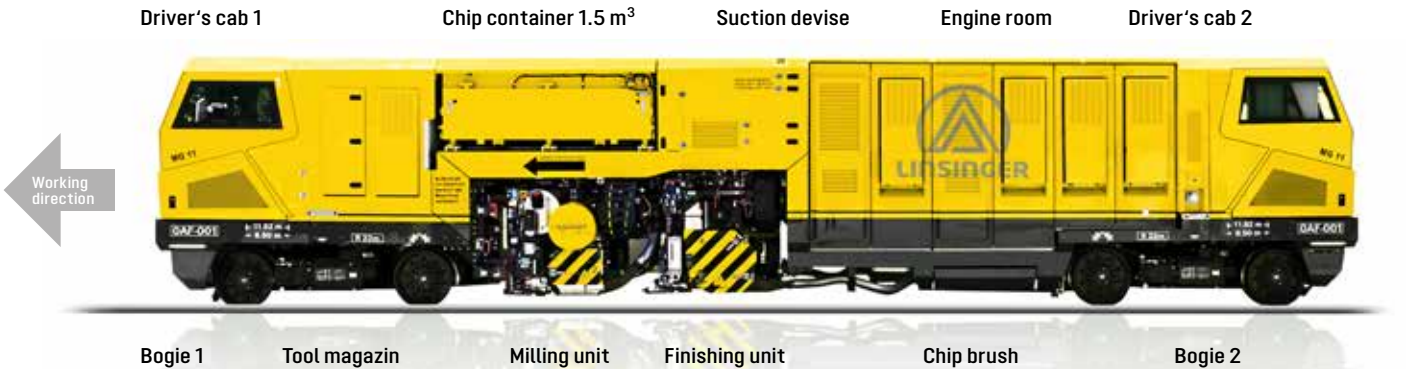


acoustic
roughness



TECHNICAL SPECIFICATIONS

Drive type of units	each side one milling unit: electric / one finishing unit: electric
Traction drive	electric
Main engine	277 kW
Weight / max. axle load	total net 32.2 t / per axle max. 8.5 t
Gauge	customised from 1.000 - 1.668 mm possible
Minimal curve radius for processing at gauge system 1,435 mm	35 m
Cant at gauge system 1,435 mm	160 mm
Chip container volume	1.5 m³
Max. speed self-propelled	50 km/h
Max. gradient	50 ‰
Variable gauge	yes



TECHNOLOGY BENEFITS



QUALITY

- Technical precision
- No defects
- No blueing
- Driving comfort and customer perception



SPEED

- 2 processes in 1 pass
- More flexibility through less shifts needed



RELIABILITY & SAFETY

- Reliable and durable
- Machine lifespan of 30 years or more
- Safety on track and accident prevention



INVENTOR

- With our unique technology we set the standards for tomorrow



LCC

- Significant increase in rail lifespan
- Low Life Cycle Costs
- Saving of taxpayer money



USABILITY

- Easy operation and low training effort



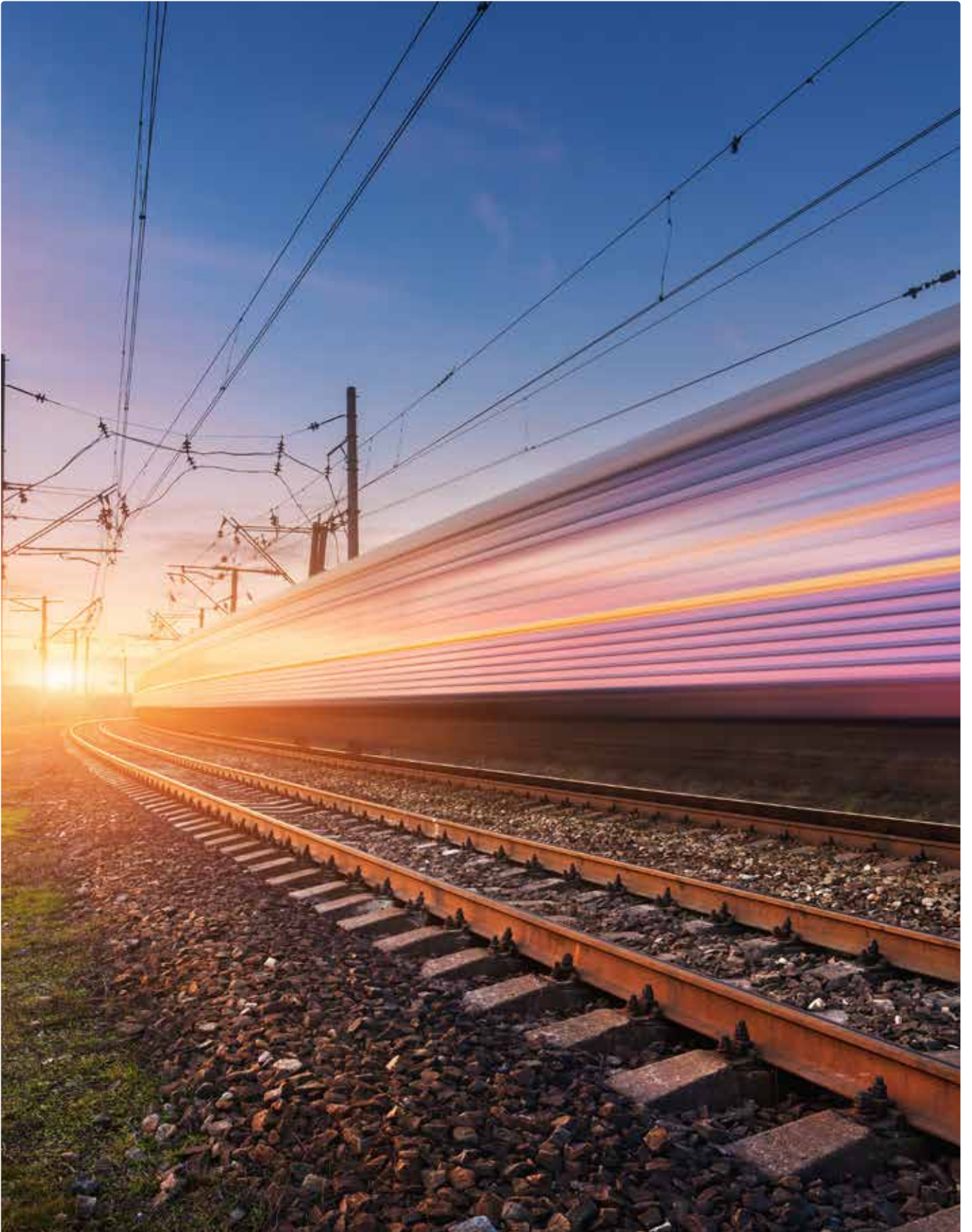
SUSTAINABLE

- Positive CO₂ balance
- Huge potential of CO₂ savings
- Environmental protection & ESG-compliant



EFFICIENCY

- Recycling, no waste of materials or manpower due to unnecessary activities



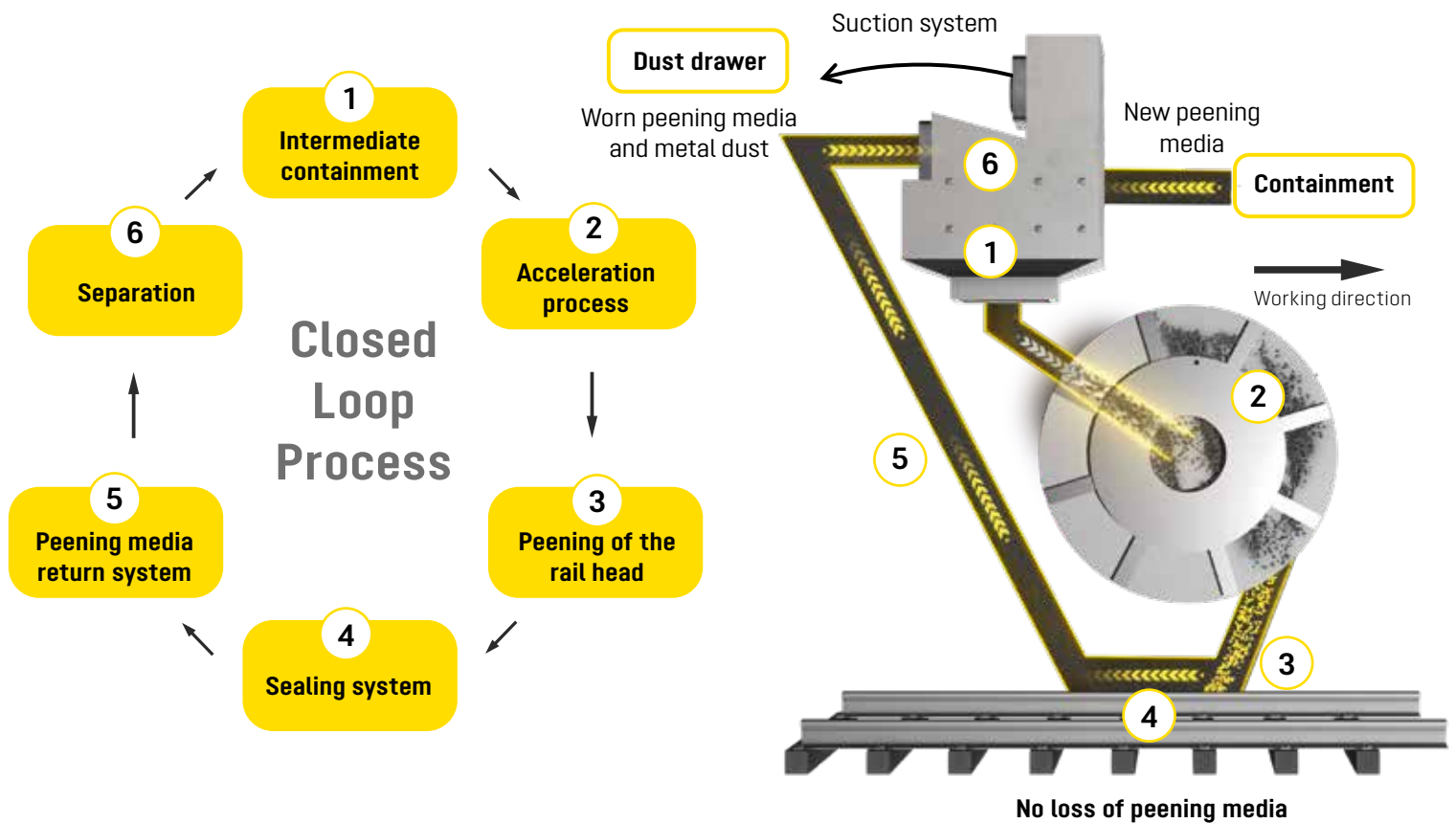
LINSINGER INNOVATIONS

LINSINGER SMART SURFACE TECHNOLOGY

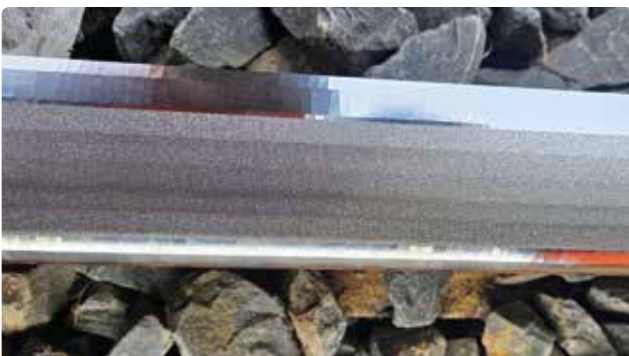
EXPLORE OUR INNOVATION IN RAIL MAINTENANCE

Introducing the LINSINGER Smart Surface Technology - a revolutionary finishing process that takes rail head surface treatment to a new level. This innovative shot peening technology hones milled surfaces to perfection. Our sustainable closed-loop system works completely without noticeable emissions and guarantees an excellent surface with perfect roughness.

CLOSED-LOOP SYSTEM



RESULT



BENEFITS

- Noise reduction
- Dust & Spark-Free
- Rail life extension
- No heat contribution into rail head
- Homogenous surface roughness
- Material forming process
- Generates residual compressive stress in the rail head surface

LINSINGER MEASURING SYSTEM

PRECISION DATA: SAVES LIVES AND TAX PAYER MONEY

Measuring data is the cornerstone of optimal rail renewal. By leveraging precise insights, maintenance becomes smarter and more efficient, leading to significant savings in taxpayer money. But the benefits don't stop there. A clear understanding of your rail infrastructure unlocks enhanced safety, quieter operations, and a smoother, more comfortable ride for everyone.

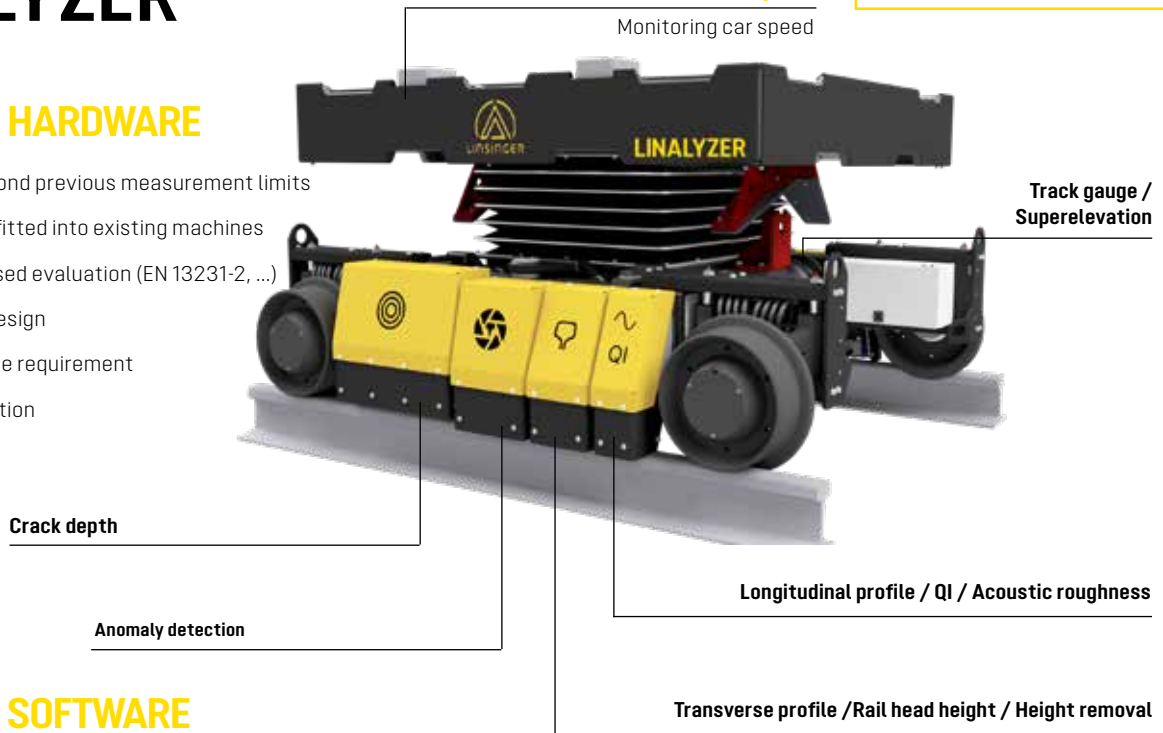
LINALYZER

MODULAR HARDWARE

- Goes far beyond previous measurement limits
- Can be retrofitted into existing machines
- Standard based evaluation (EN 13231-2, ...)
- Decoupled design
- Minimal space requirement
- GPS-localisation

**UP TO
60 km/h**

The values shown represent the maximum technically achievable speeds. National regulations may specify different operating speeds.



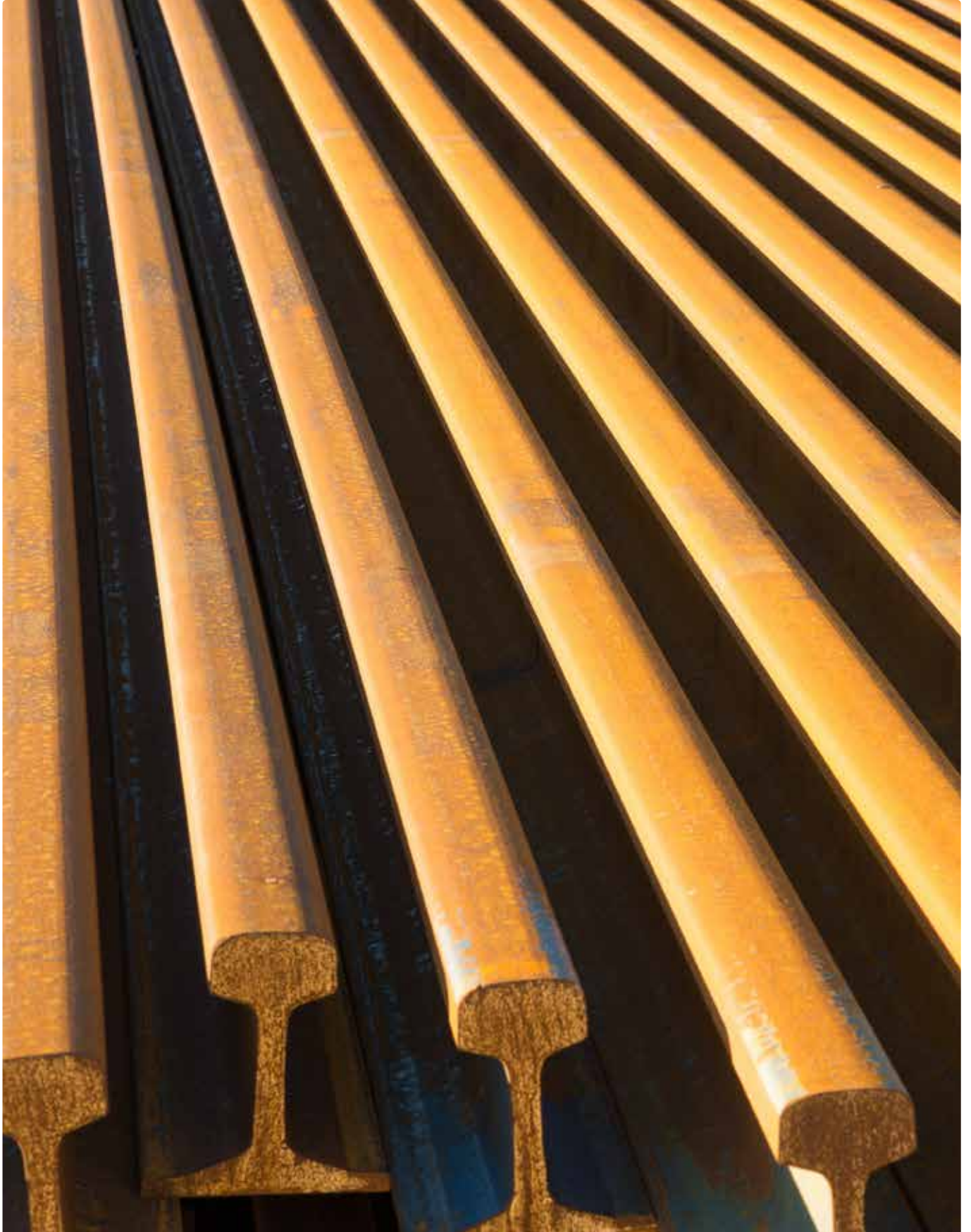
MODULAR SOFTWARE

- Interface – clear & user-friendly
- Quick shift reports
- Centralized helpdesk
- Customizable layout
- Each level of detail selectable
- AI supported data evaluation



ONE Software
Database
System



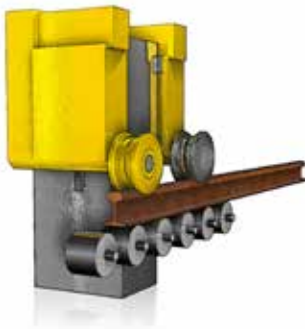


STATIONARY SOLUTIONS



STATIONARY RAIL HEAD MILLING MACHINE SKF FOR STATIONARY RAIL HEAD REPROFILING

For centralised rail head processing we developed a stationary rail head milling line.



APPLICATION

- For use in welding, used rail and repair plants in 3-shift operation
- For rail manufacturers to remove the mill scale

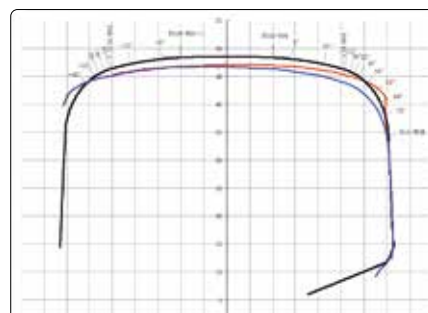
ADVANTAGES

- Any changeable profile shape
- Side of the running edge freely selectable
- Re-profiling by milling and grinding in one simple operation
- Constant machining accuracy thanks to CNC axes
- No subsequent operation necessary

ECONOMICALLY VIALE PROCESSING

Redoubling of rail life through running gauge changeover

Low tool costs



Transverse profile before and after processing



RAIL SAWING & DRILLING MACHINE LSB FOR SAWING AND SIMULTANEOUS DRILLING OF RAILS

APPLICATIONS

Rolling mills, rail welding and switch manufacturing mills

ADVANTAGES

- Sawing and drilling in a single pass
- Inclined saw design
- Fully automated
- Turnkey solutions

OPTIONS

- Drilling hole cold pre-stressing for longer life
- Deburring unit
- Testing sample manipulator
- Longitudinal measuring system with temperature compensation

CYCLE TIME 30 SECONDS

One saw cut and
six drilled holes

TYPE	QTY DRILLS	RAIL HXB MAX
KSA 500 S	0	190 x 160 mm
LSB 800	0	200 x 220 mm
LSB 800/S1	1	200 x 220 mm
LSB 800/S2S	1*	200 x 220 mm
LSB 800/S3	3	200 x 220 mm
LSB 800/S6	6	200 x 220 mm

*special design for switch manufacturing mills



RAIL REPAIR AND WELDING PLANT THE COMPLETE SOLUTION FOR NEW & USED RAILS

The LINSINGER turnkey solutions for new and used rails is the rail repair and welding plant. LINSINGER presents itself as the partner for turnkey solutions, from basic concepts up to complete solutions.

EXAMPLE OF WORKFLOW FOR NEW RAILS

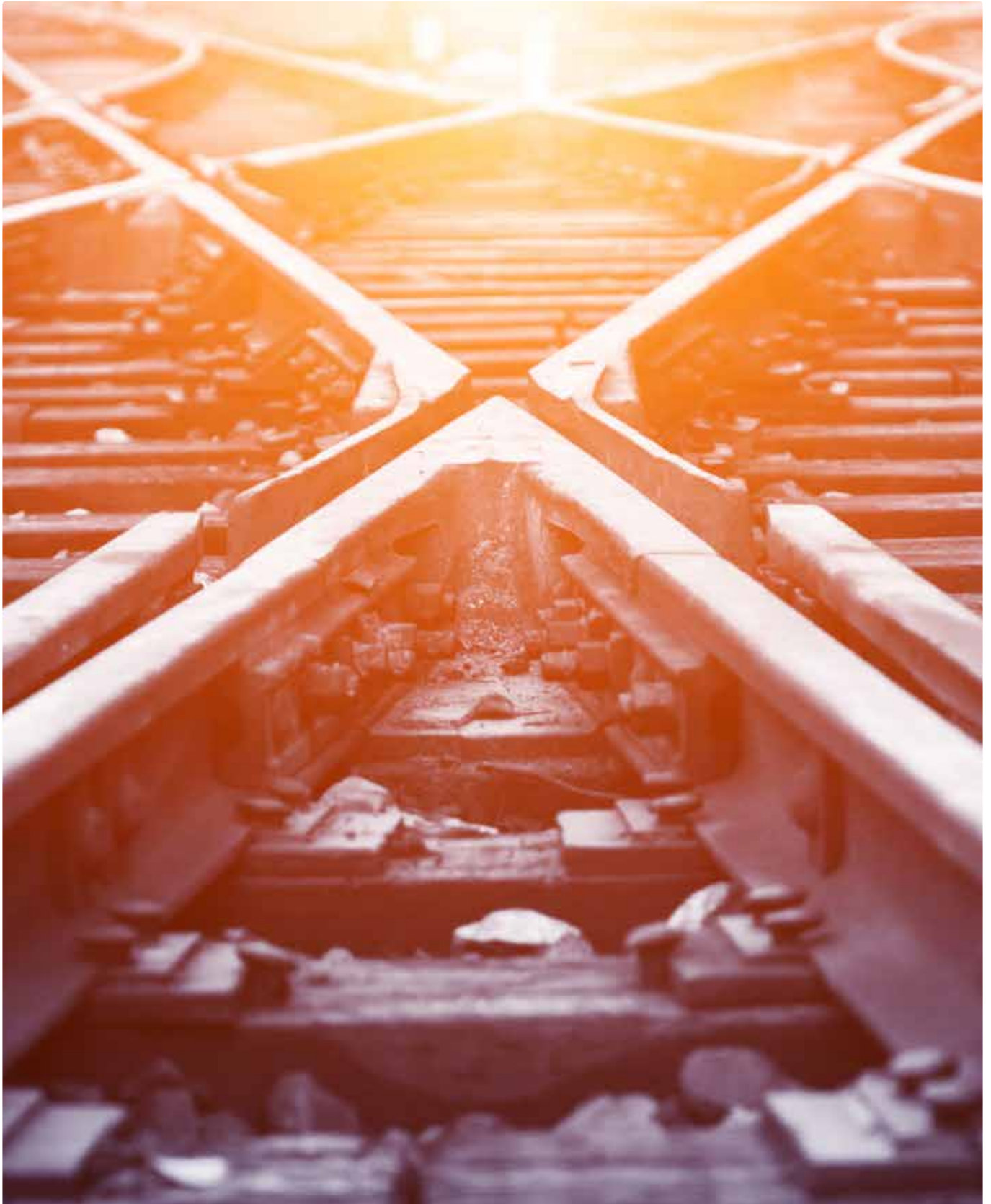
- Welding of rail joints, including brushing preparation
- Fully-automatic removal of excess weld bead
- Ultrasonic checking of the welding seam and sawing samples
- Cutting to length and drilling

ADVANTAGES

- A partner for all solutions
- High efficiency through flexible machining in the factory
- Modular assembly according to customer requirements
- Design for 3-shift operation

TURNKEY PACKAGE

Conservation of
material
resources and
environment



**TOOL TECHNOLOGY
& SERVICE**



TOOL TECHNOLOGY CUTTER HEADS

LINSINGER has invested considerable effort in optimising cutter heads to increase the precision, machining speed, tool life and cost-effectiveness of the rail milling process.

In-house research and development department as well as its own design and mechanical manufacturing ensure that it meets worldwide customer requirements and generates special solutions.

Worldwide active tool technicians support customers on site. These are our guarantees for consistent LINSINGER quality and precision.

SPARE PARTS

Our well-trained service team ensures a fast and reliable supply of original spare parts, perfectly matched to LINSINGER machines.

service@linsinger.com



CUSTOMER SERVICE & MAINTENANCE

The LINSINGER service team offers worldwide (remote) maintenance, repairs and maintenance for LINSINGER machines. Our highly motivated service team tries to handle all service and maintenance requests as quickly as possible, also when demand is high.

In case of emergency, we can be contacted around the clock. Our 24/7 service hotline provides experienced and highly trained LINSINGER service staff 24 hours a day, 7 days a week.

LINVISION 24/7 AUDIO VISUAL SUPPORT BY LINSINGER

Put on the LINvision helmet and fold down the glasses to connect instantly to LINSINGER. The service team sees the issue and reacts immediately. Visuals prevent communication problems, and a message board provides additional information, allowing quick solutions.

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