RAIL TECHNOLOGY

INNOVATION, TECHNOLOGY
AND HIGHEST PRODUCTIVITY

LINSINGER

WWW.LINSINGER.COM

SINCE 1959

WE SUCCEED

WHERE OTHERS FAIL

#TRUSTTHEINVENTOR

CONTENT

WHO IS LINSINGER?

THE INVENTOR OF RAIL MILLING

LINSINGER Maschinenbau is a globally leading technology company with a 85-year tradition and 65 years of experience in rail milling, its manufacturing & operation. As pioneers in specialty 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

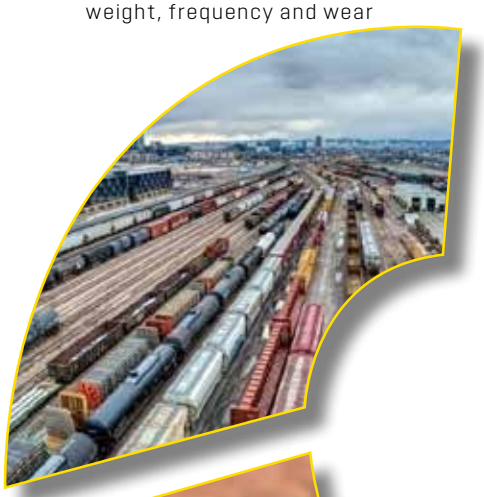
LONGITUDINAL PROFILE

RCF – ROLLING CONTACT FATIGUE

CHALLENGES OF RAILWAYS

INCREASING DEMANDS

Maximized cargos and passenger traffic, resulting in increasing weight, frequency and wear



CLIMATE CHANGE

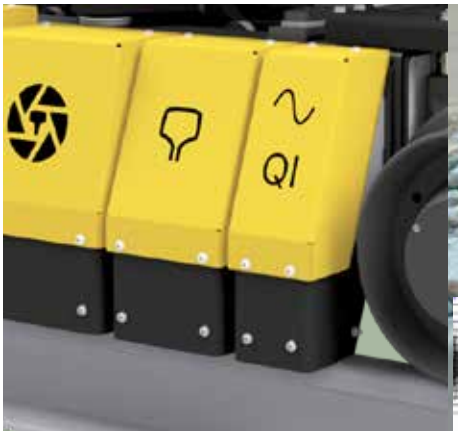
Measures, regulations and laws that come with it

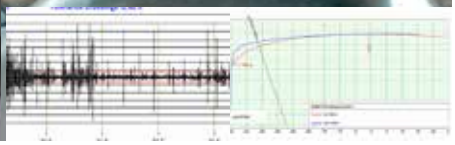
RAIL DEFECTS

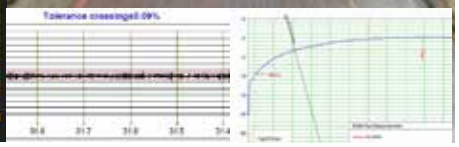
- Safety risk
- Downtime - high failure costs
- Noise pollution
- Reduced service life of rail
- Increased carbon footprint

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

Refinish the milled surface with a Finishing unit or our Linsinger Smart Surface Technology

5. REPORT

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

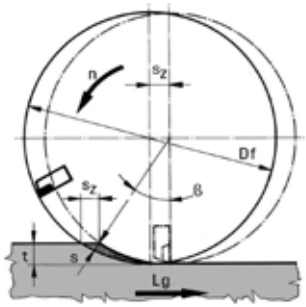
HOW DOES IT WORK?

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.

2. FINISHING

Right after the milling process, the finishing process follows in order to smooth out the milled surface. What comes as a result is a noise-reduced rail with a low roughness.



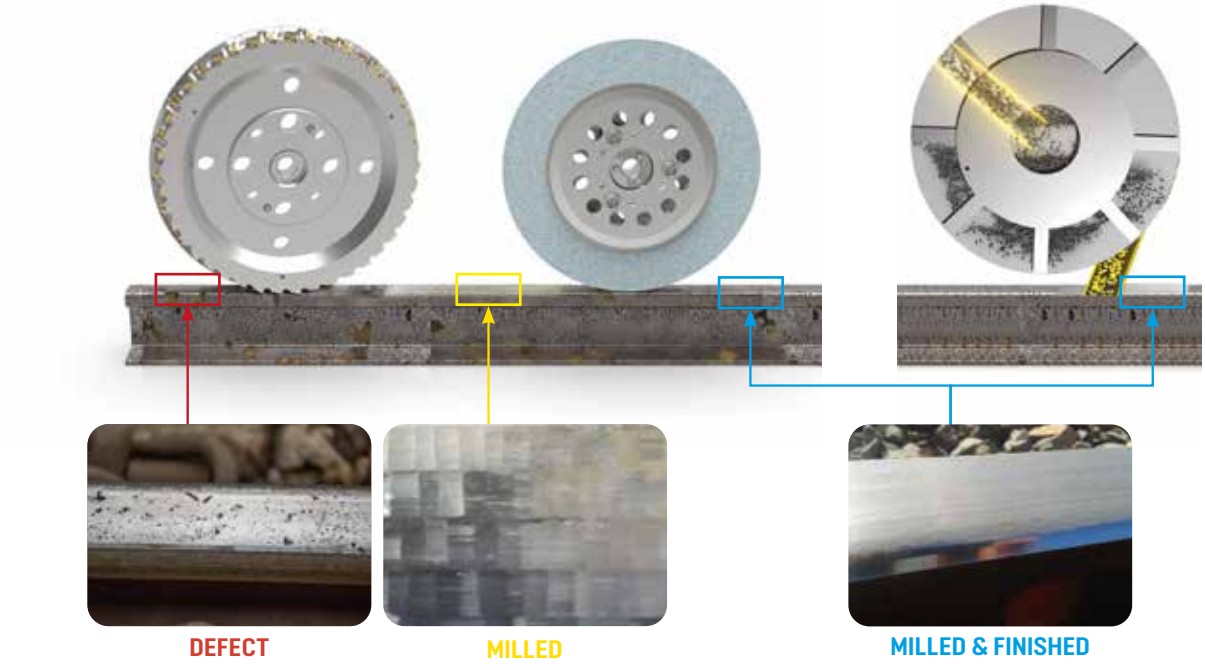
0,1 - 6 mm in one pass

1. MILLING

2. FINISHING

NEW

- Polishing or - LINSINGER Smart Surface Technology (LSST)



DEFECT MILLED MILLED & FINISHED

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 shifts are needed in order to achieve the best outcomes. Along the way you get payback by recycling metal chips and consumables.

MAXIMAL CO_2 SAVINGS & NO HEALTH THREAT

By maximizing the rail life, less steel is required for new rails. That is the biggest saving in CO_2. By recycling metal chips and consumables, we contribute to a positive CO_2 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

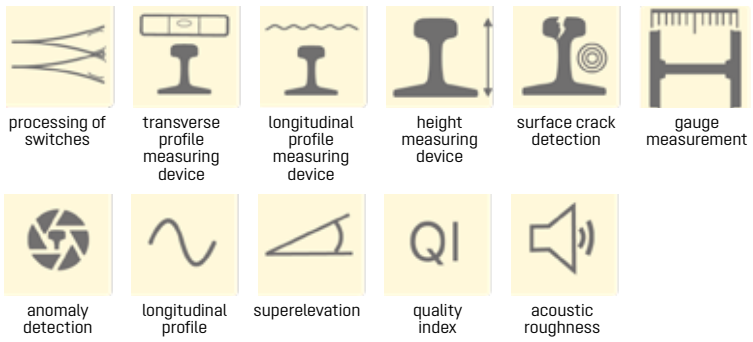
ADVANTAGES

- Modular Design - Future technologies easily adaptable
- Variable energy supply concept - Two independent power sources - powered by pantograph, hydrogen, diesel or battery
- High Output - 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



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

MG 31

Highly efficient rail milling train

RAIL MILLING TRAIN MG31
FOR LARGE WORKLOADS

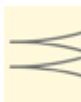
APPLICATION:

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

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 m^3
Maximum speed self propelled	100 km/h
Max. gradient	40 ‰
Variable gauge	no

RAIL MILLING TRAIN SF06-FFS PLUS
FOR LARGE WORKLOADS

APPLICATION

Main lines

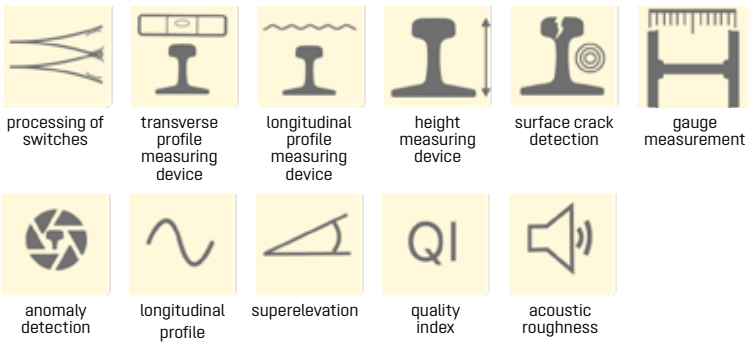
ADVANTAGES

- 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



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 m^3
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

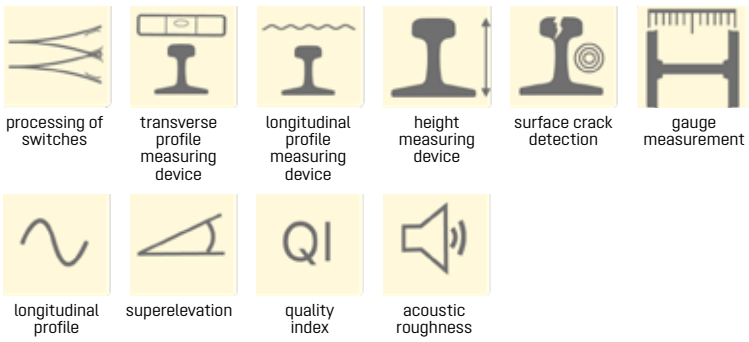
ADVANTAGES

- 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

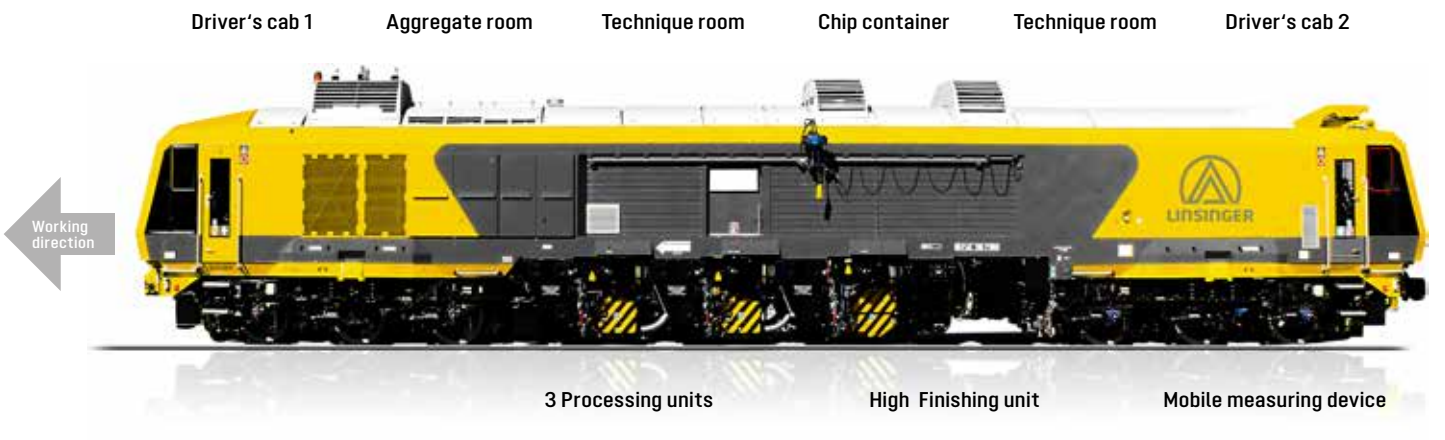
The most proven rail milling train in the world

POSSIBLE OPTIONS

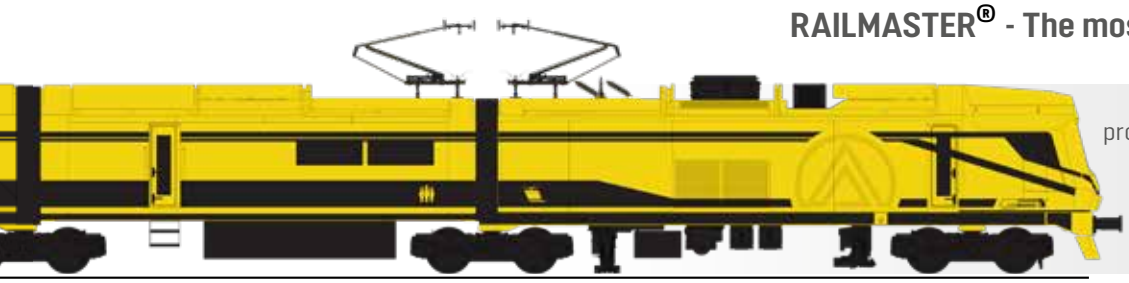


TECHNICAL SPECIFICATIONS

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 m^3
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 2.000 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 2,000 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 2,000 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 2,000 m/h
max. removal rate per pass 0.1 - 4 mm
total length 24 m
height 4.2 m / width 3.3 m

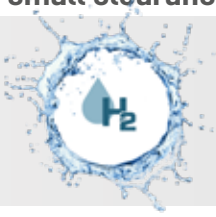
SF02T-FS - The train for special demands

processing speed up to 1,000 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

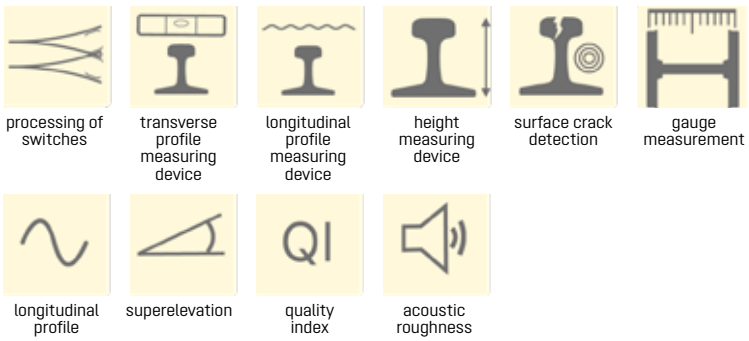
ADVANTAGES

- 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

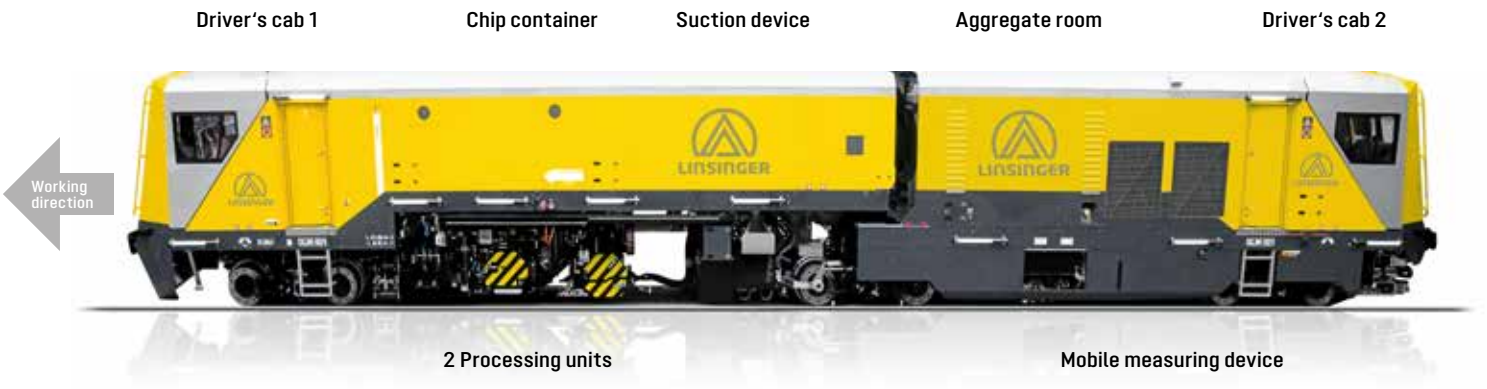
Highly versatile rail milling train

POSSIBLE OPTIONS



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 m^3
Max. speed self propelled	60 km/h
Max. gradient	45 ‰
Variable gauge	yes



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

APPLICATION

Road & rail, easy re-railing and transfer

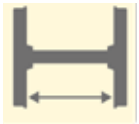
ADVANTAGES

- 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

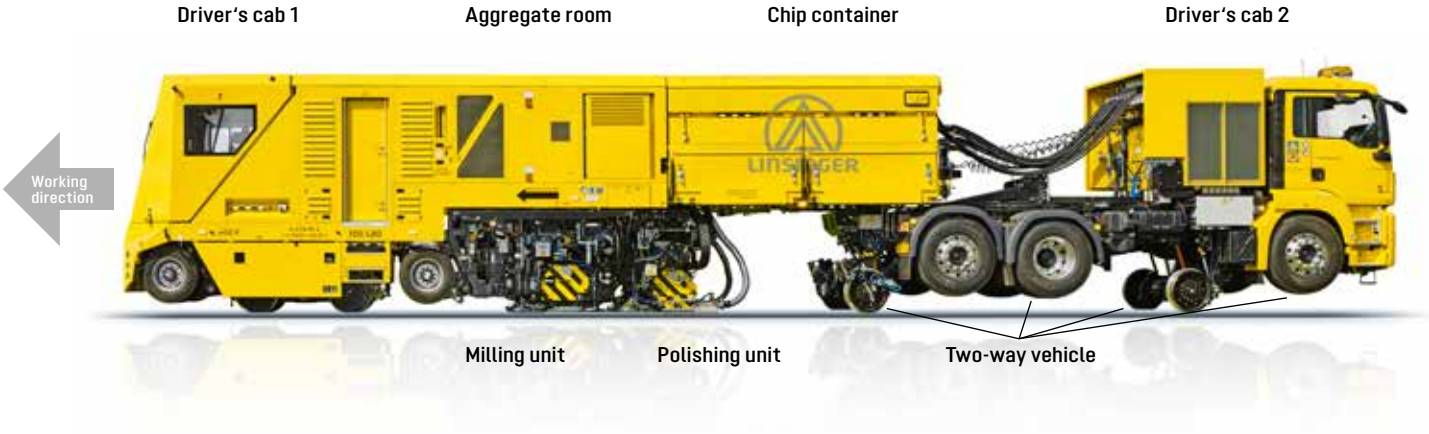

processing of grooved rails


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 m^3
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
H_2 DRIVE

APPLICATION

Metros, light rails, trams

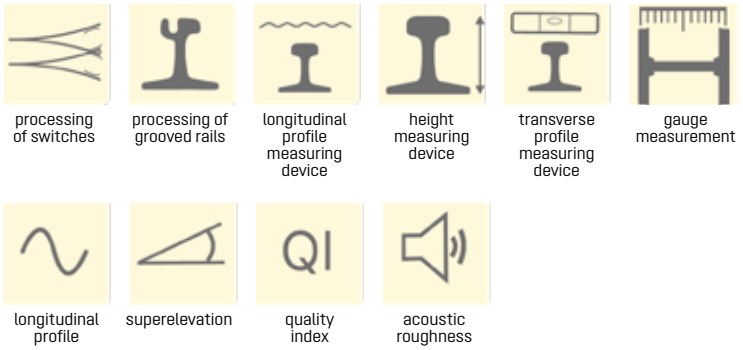
ADVANTAGES

- Diesel electric drive
- High 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



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 m^3
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

RELIABLE & SAFETY
- Reliable and durable
- Product lifespan of 30 years or more
- Safety on track and accident prevention

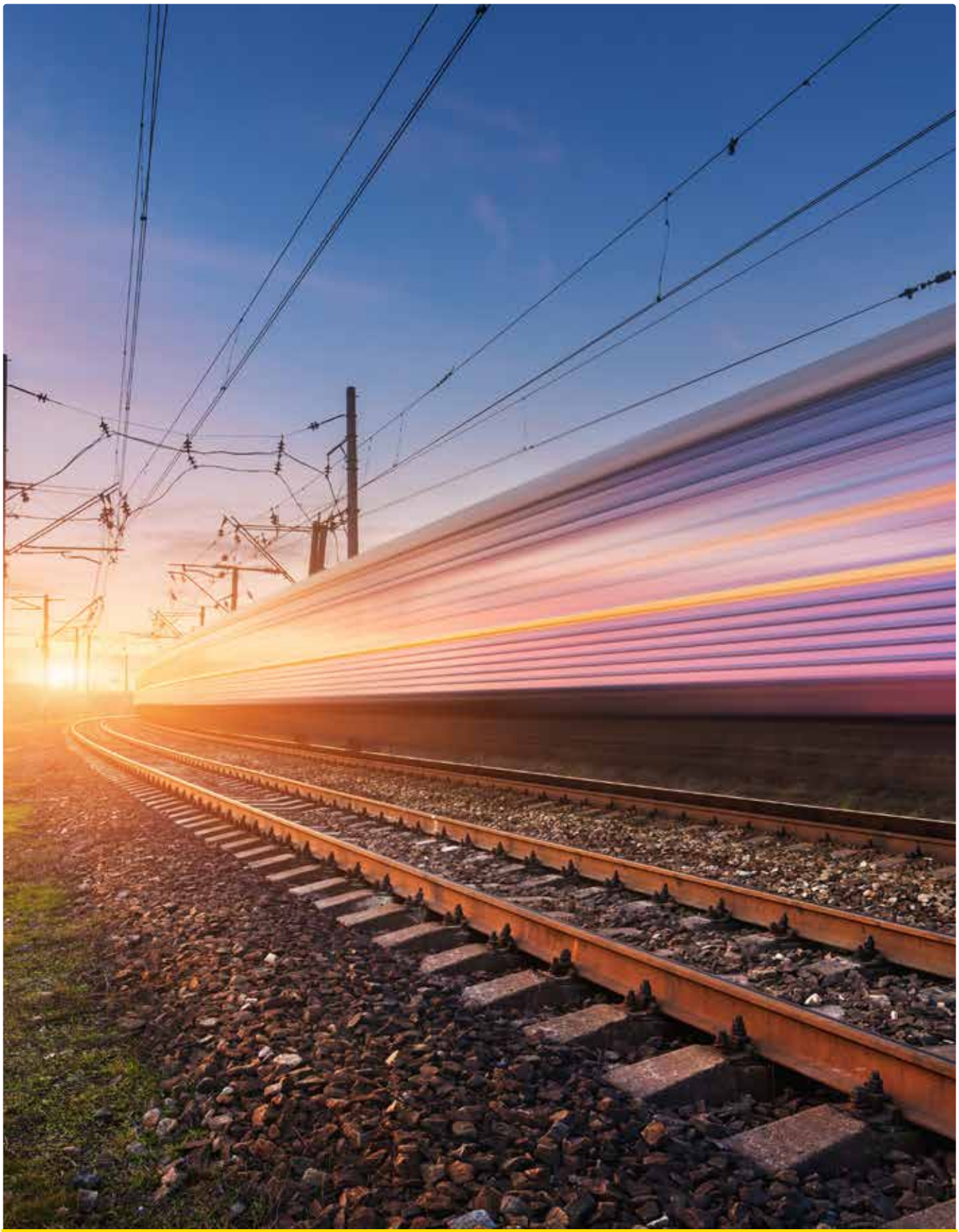
INVENTOR
- With our unique technology we set the standards for tomorrow

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

USABILITY
- Easy operation and low training effort

SUSTAINABLE
- Positive CO_2 balance
- Huge potential of CO_2 savings
- Environmental protection & ESG conform

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



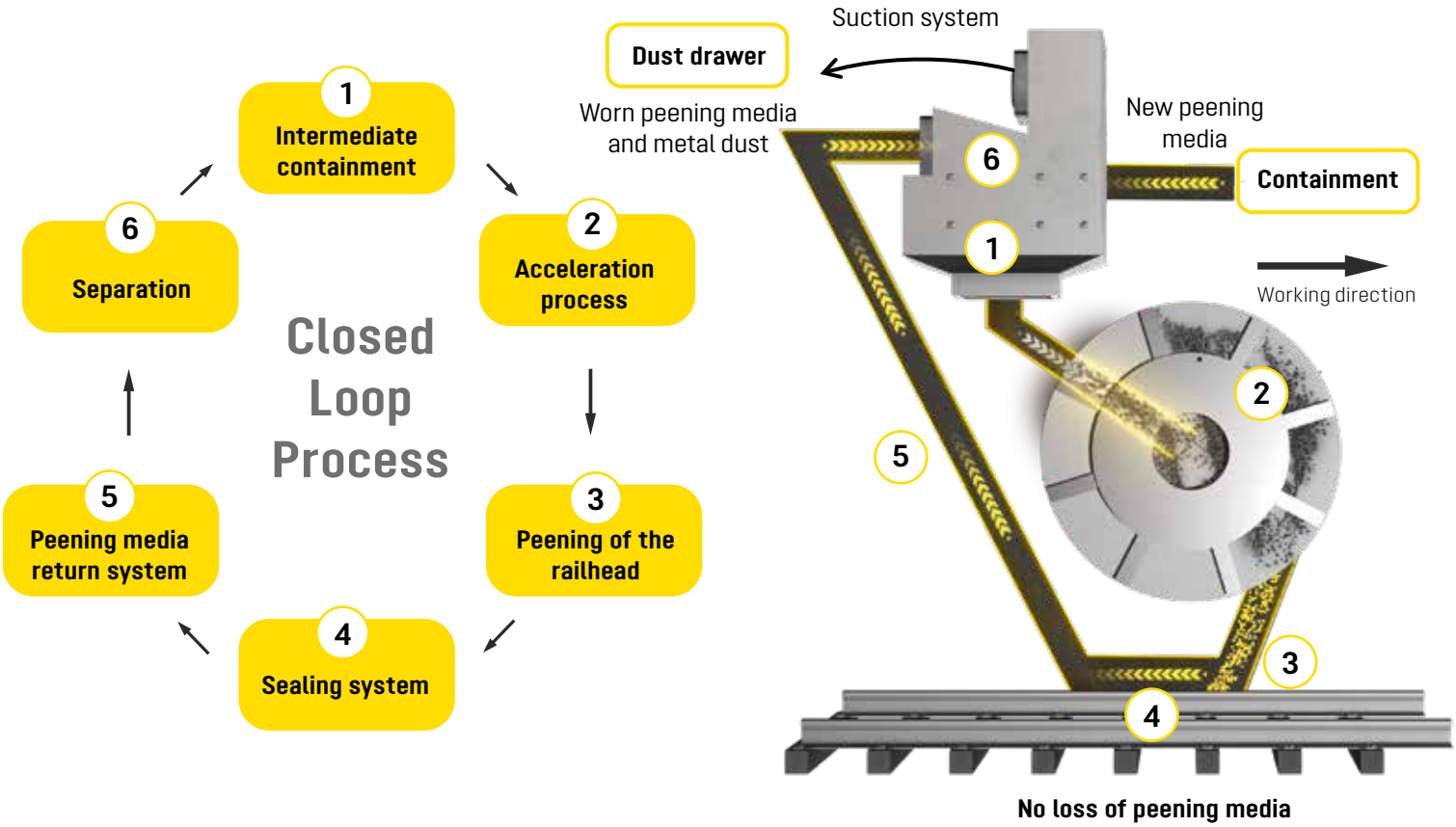
LINSINGER INNOVATIONS

LINSINGER SMART SURFACE TECHNOLOGY

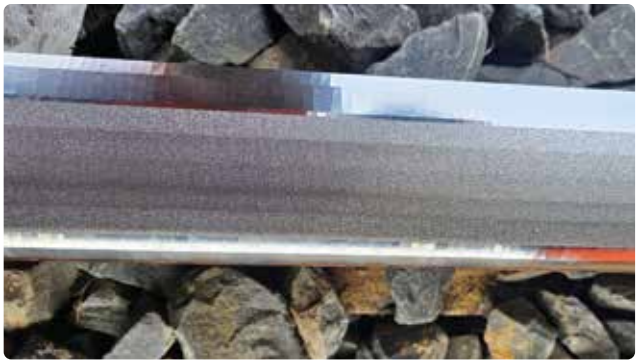
EXPLORE OUR INNOVATION IN RAIL MAINTENANCE

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 railhead
- 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

UP TO 60 km/h

Monitoring car speed

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

Track gauge / Superelevation

Crack depth

Anomaly detection

Longitudinal profile / QI / Acoustic roughness

Transverse profile /Railhead height / Height removal

MODULAR HARDWARE

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

MODULAR SOFTWARE

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

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

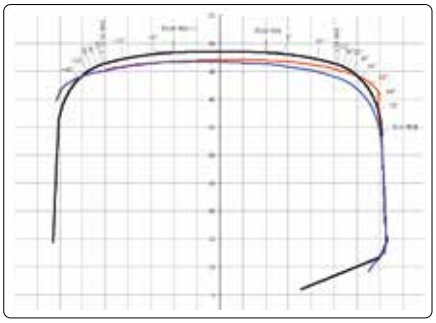
ADVANTAGES

- 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 VIABLE PROCESSING

Redoubling of rail life through running gauge changeover

Low tool costs



Transverse profile before and after processing

LINCUT® APPROVED

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 solution for new and used rails is the rail repair and welding plant. LINSINGER presents itself as the partner for turneky 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 requestsas 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.

English 07/2026

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