LINSINGER Rail Milling on Heavy Haul

All Railway Networks in the world have problems caused by the rail rolling-stock interaction.

The wheel – rail interaction causes damages to both components - the wheel and the rail

The wheel and the rail suffer from high wear

Transverse Rail Head profile gets worn = flat rail / metal flow

Longitudinal Rail Head Profile gets worn = corrugations and Waves

Increase of Rolling Stock Noise (Airborne Noise / Groundborne Noise)

Reduction of Travel comfort and Travel Safety

Damages cause different problems including reduced asset life cycle

The following presentation will introduce the most suitable rail profiling technology to address the rail wear problems….

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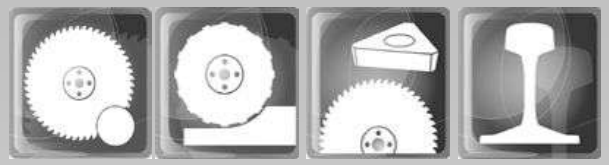

LINSINGER provides:

- SAWING TECHNOLOGY
- RAIL TECHNOLOGY
- MILLING TECHNOLOGY
- SERVICE AND TOOLS

LINSINGER serves:

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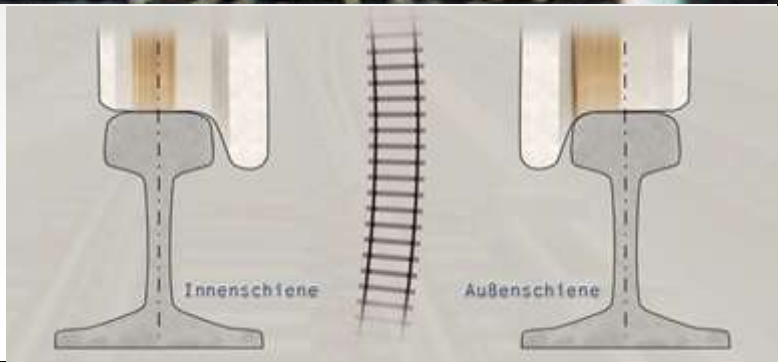
Wheel – Rail Interaction System



ADVANTAGES

OF THE

LINSINGER RAIL MILLING TECHNOLOGY

ON HEAVY HAUL

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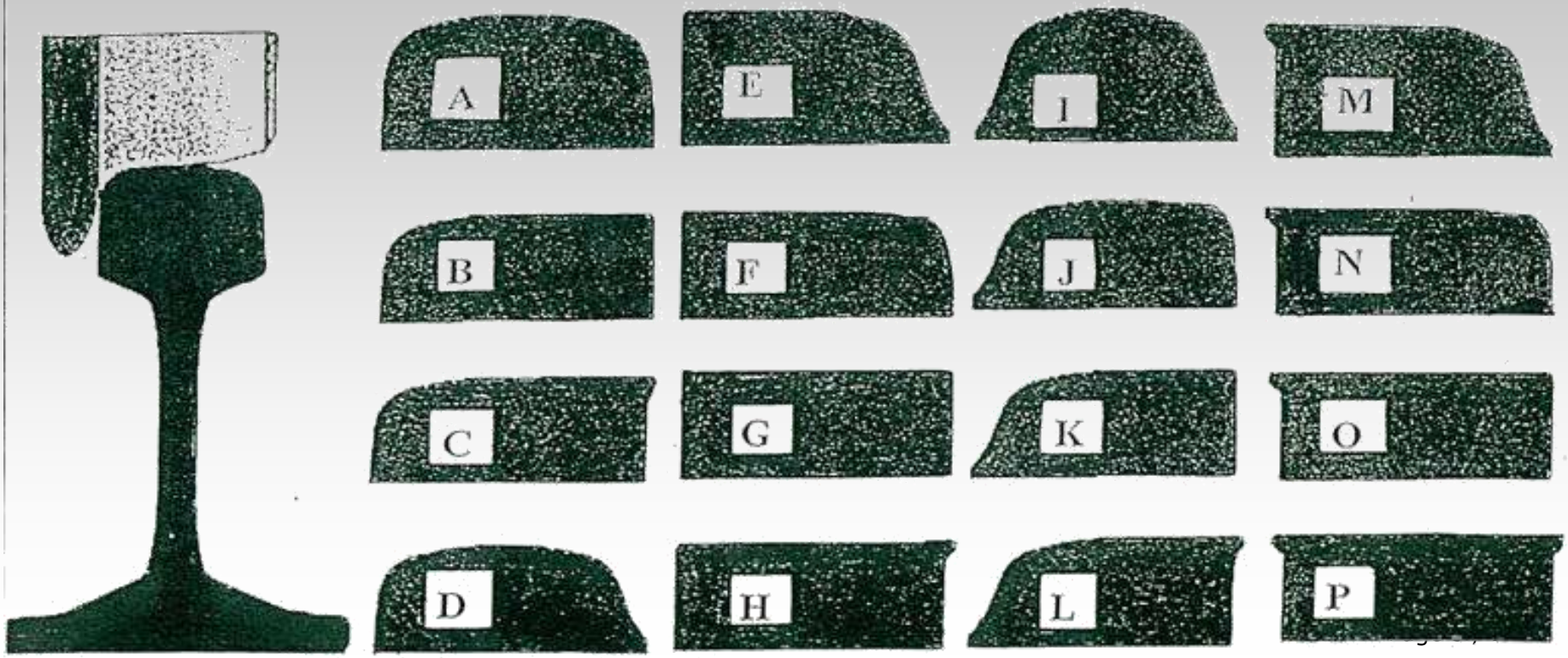
RAIL HEAD PROFILE DEVIATIONS

BASIC – PROFILES RAIL – GRINDING

In the reality the following worn-profiles can be categorized:



Heavy

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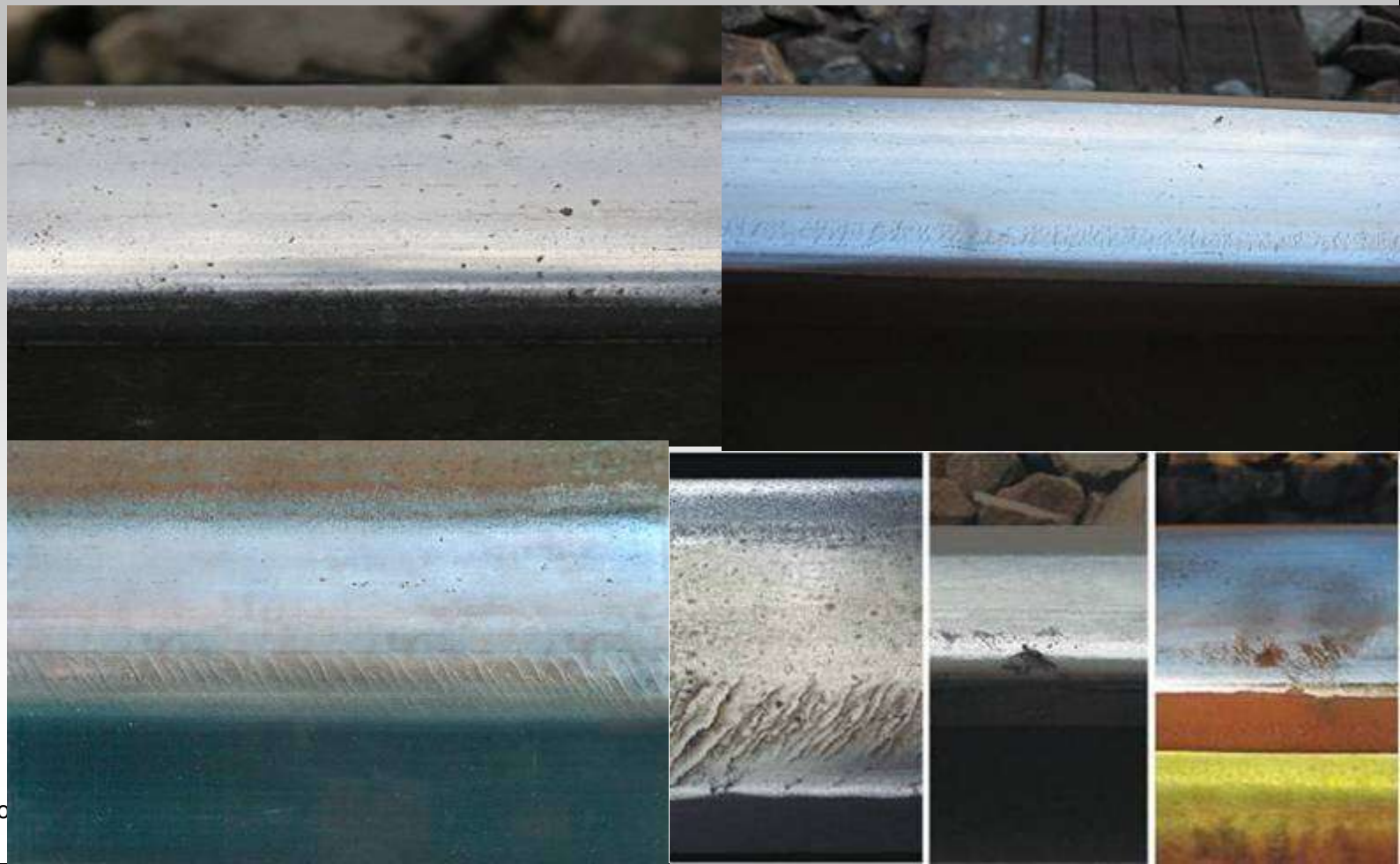
RAIL HEAD SURFACE DEFECTS



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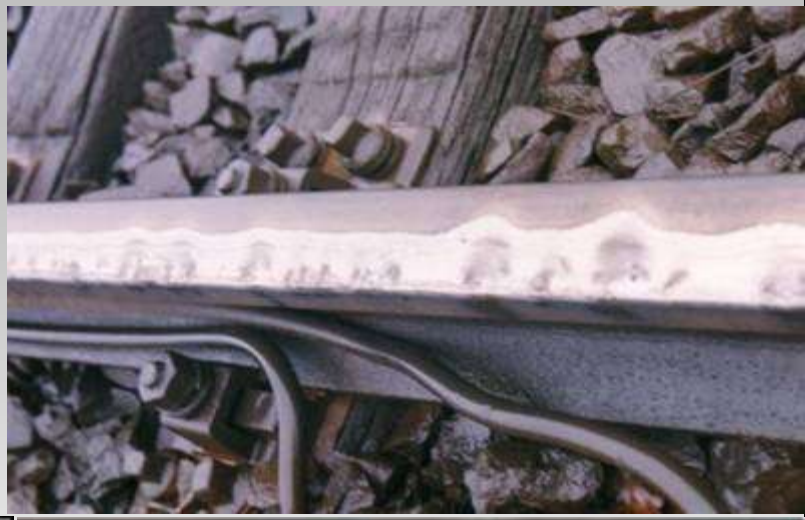
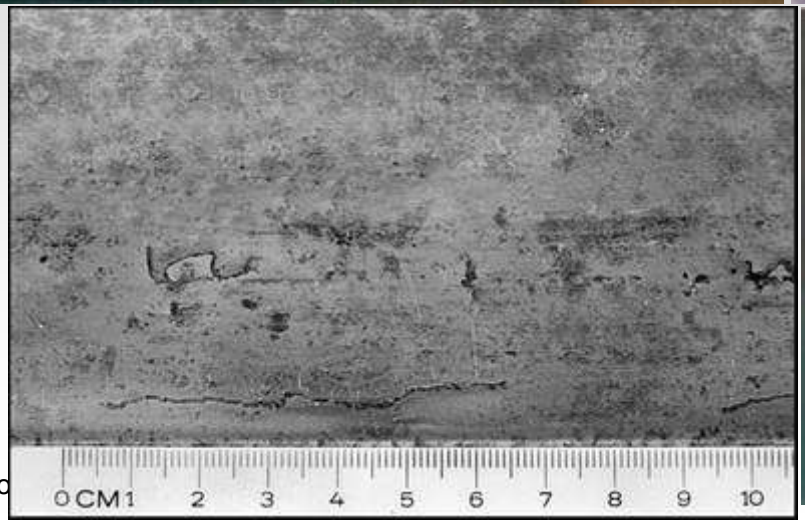
RAIL HEAD SURFACE DEFECTS





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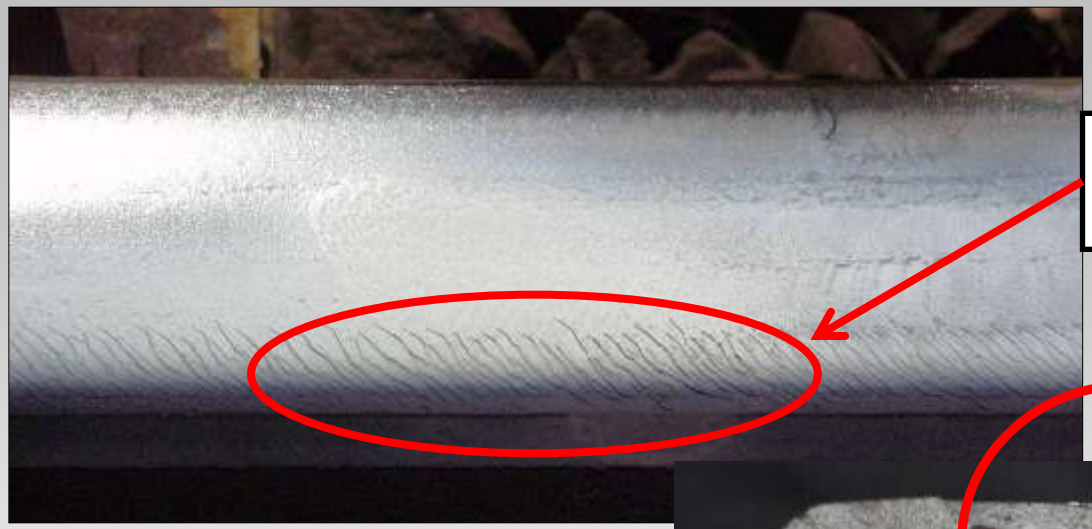
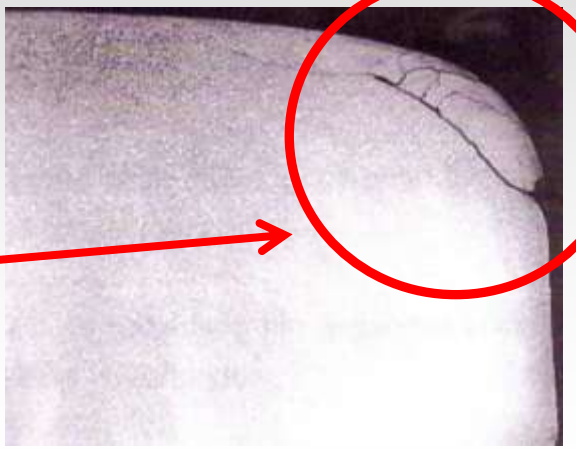
HEAD CHECKS



„Visually visible“ defect on the surface of the rail head

„Not visually visible“ defect on the surface of the rail head



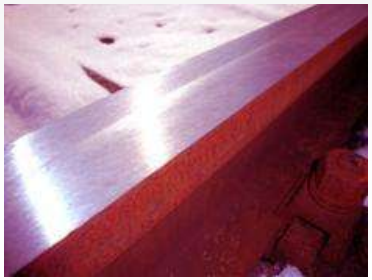
LINSINGER RAIL MILLING

NO BLUEING

NO RISK OF FIRE

NO DUST AND DIRT

CLEAN AND SAFE OPERATION WITH NO RISKS



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MILLING in Operation

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RAIL MILLING VEHICLES

SF02T-FS

SF03-FFS

SF02-FS Truck

SF06-FFS PLUS

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RAIL MILLING Train MG 31

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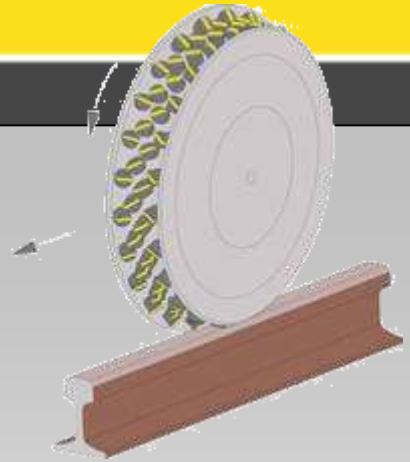
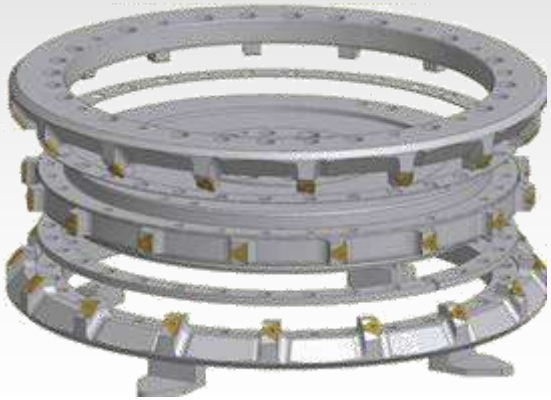
MILLING TOOLS

CUTTERHEADS





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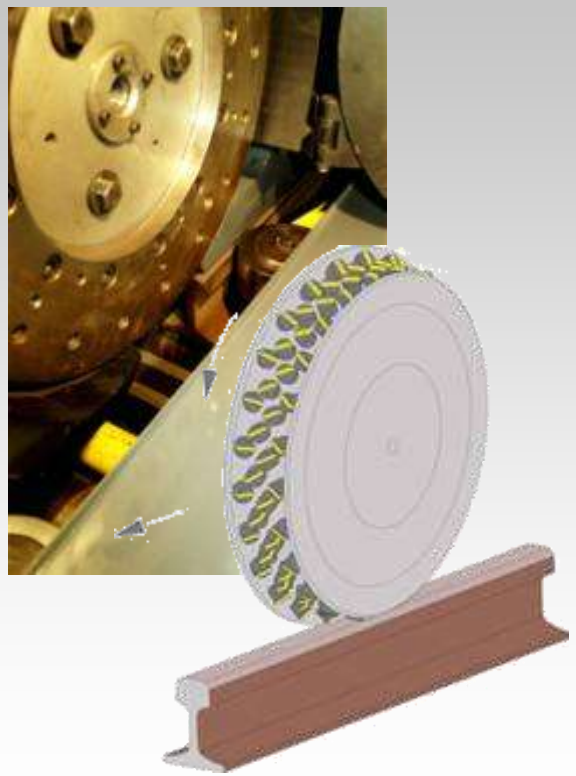
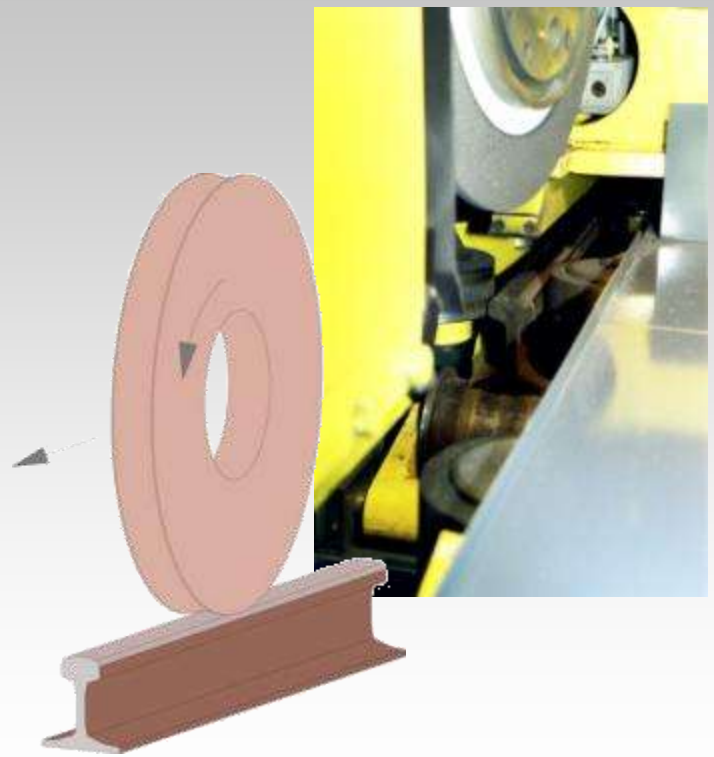
RAIL PROCESSING TOOLS

CUTTER HEAD



GRINDING WHEEL



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RAIL PROCESSING UNITS

MILLING UNIT

GRINDING UNIT

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SF03W-FFS

For Application in all Railway Networks

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LINSINGER RAIL MILLING

Milling in sensitive areas during train passing

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SF06-FFS PLUS

For Application in all Railway Networks

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SF03W-FFS PLUS

For Application in all Regions and during all Seasons


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RAIL ROAD TRUCK

For High Flexible Application in Railway and Rail Transit Networks

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LINSINGER RAIL MILLING

For High Flexible Application in Railway and Rail Transit Networks

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RAIL CONDITION AFTER 1 MILLING/GRINDING PASS

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Typical Track Conditions after Milling

APPLICATIONS OF MILLING

- New Rail Processing
- Maintenance / Rail Profiling
- Processing in sensitive areas
- Noise Reduction
- Preventive Maintenance
- Gauge Correction
- Anti-Head-Check Profiling

MAINLINE PROCESSING

SWITCHES AND TURNOUTS

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GAUGE PROCESSING 70°

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GAUGE PROCESSING 90°

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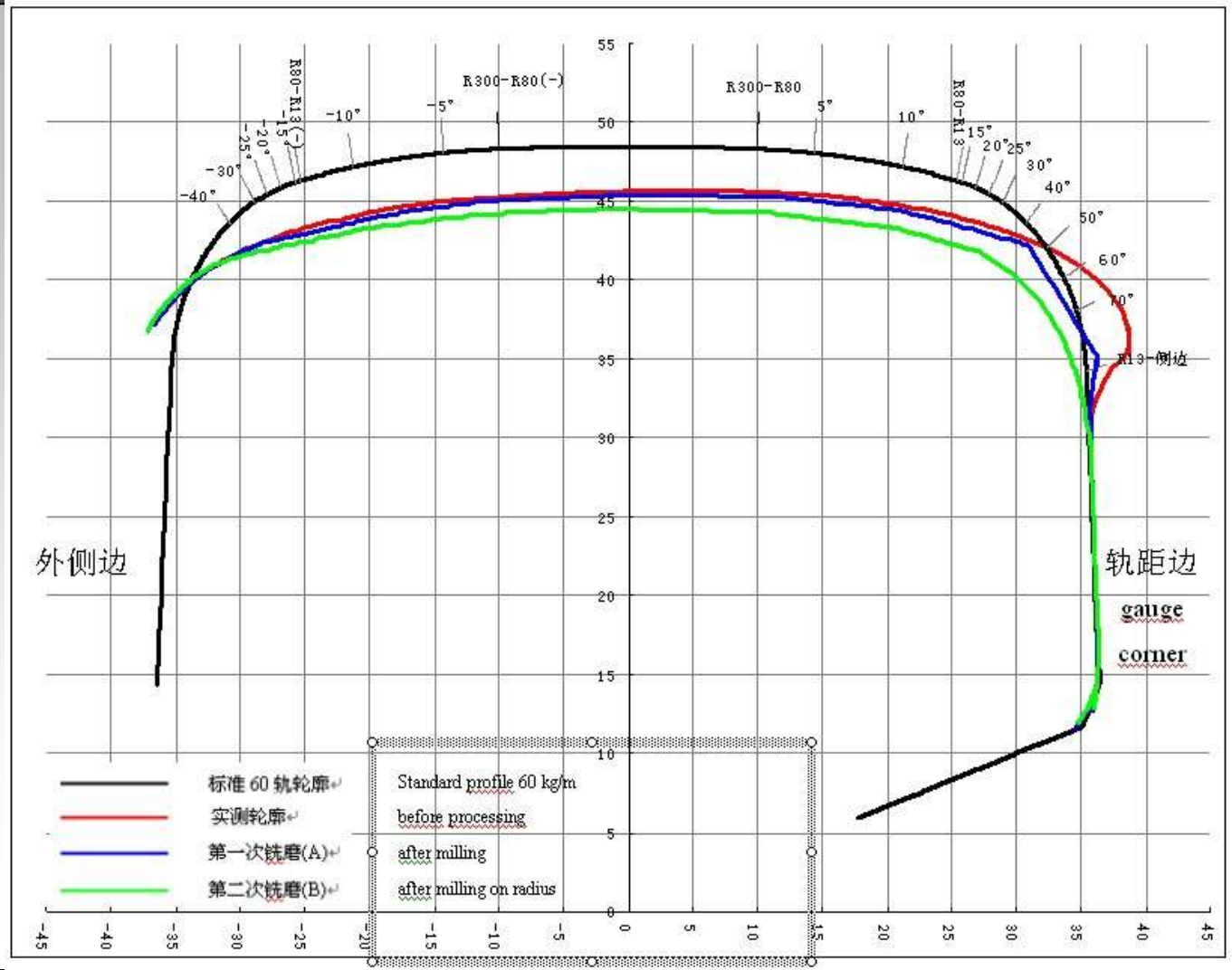
MEASUREMENTS



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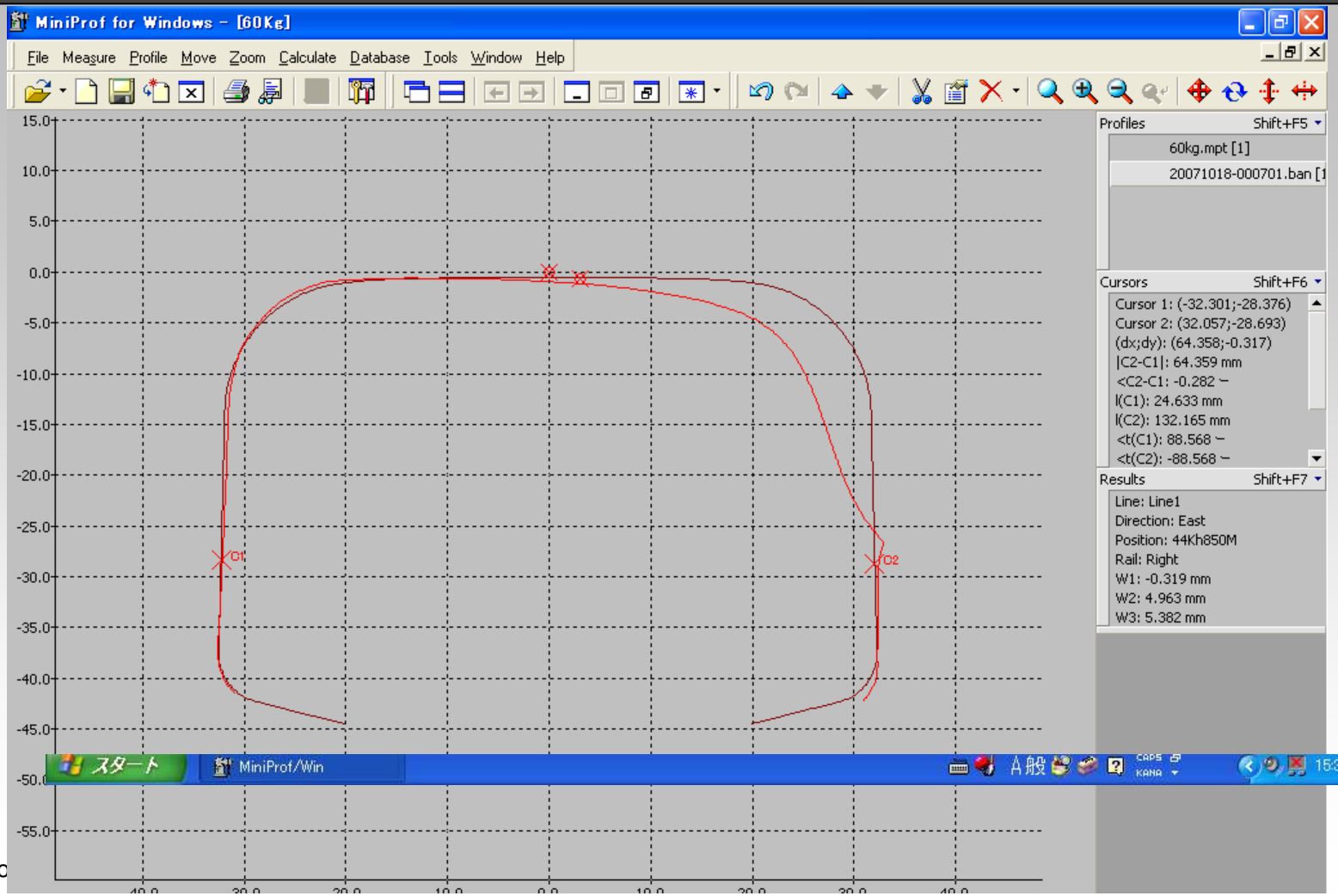
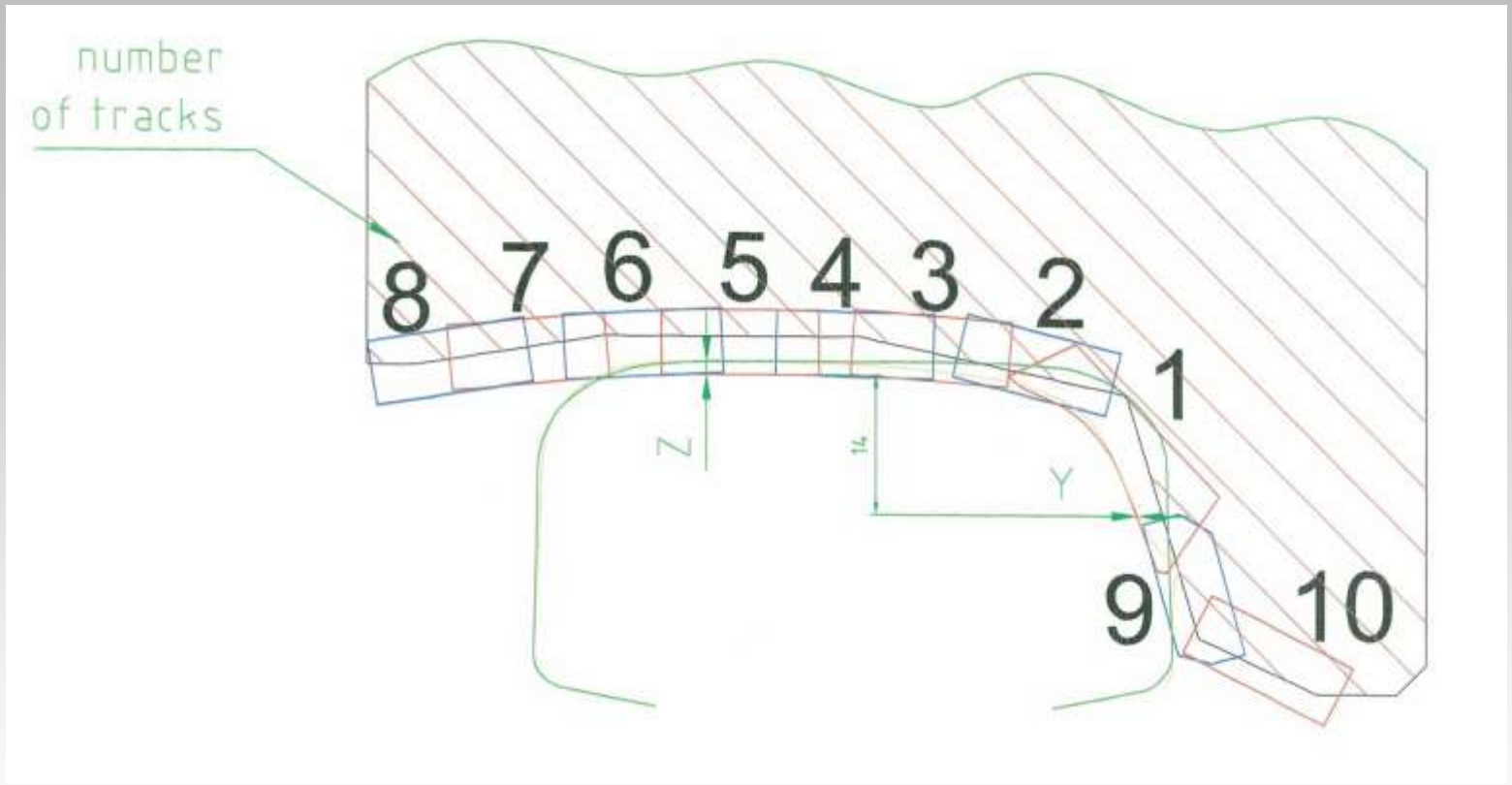
Worn-Rail-Profile



LINSINGER Cutterhead Configuration



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Typical rail surface condition defects >0,7 inch depth

Conventional grinding requires multiple passes to eliminate this defects !

Linsinger Milling technology may require 1 pass !

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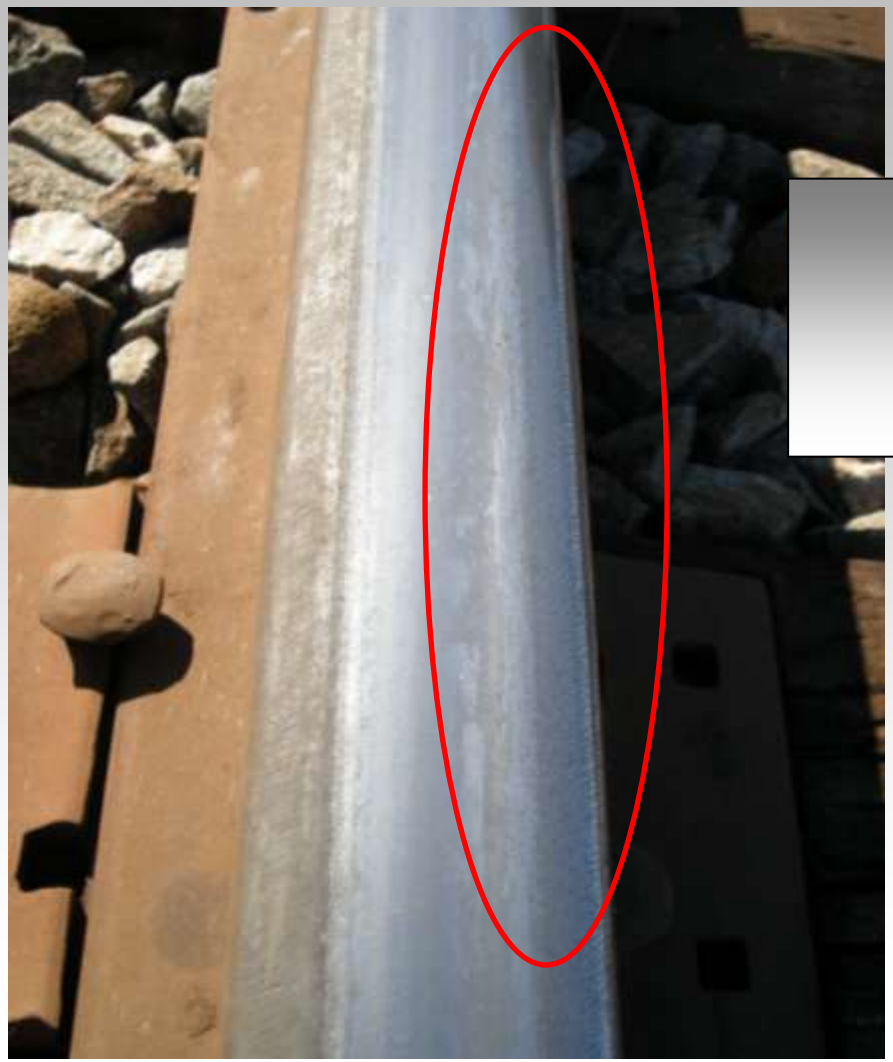
Rail Head defects
defects >0,05 inch depth



Conventional grinding requires multiple passes !

Milling technology may require 1 pass !

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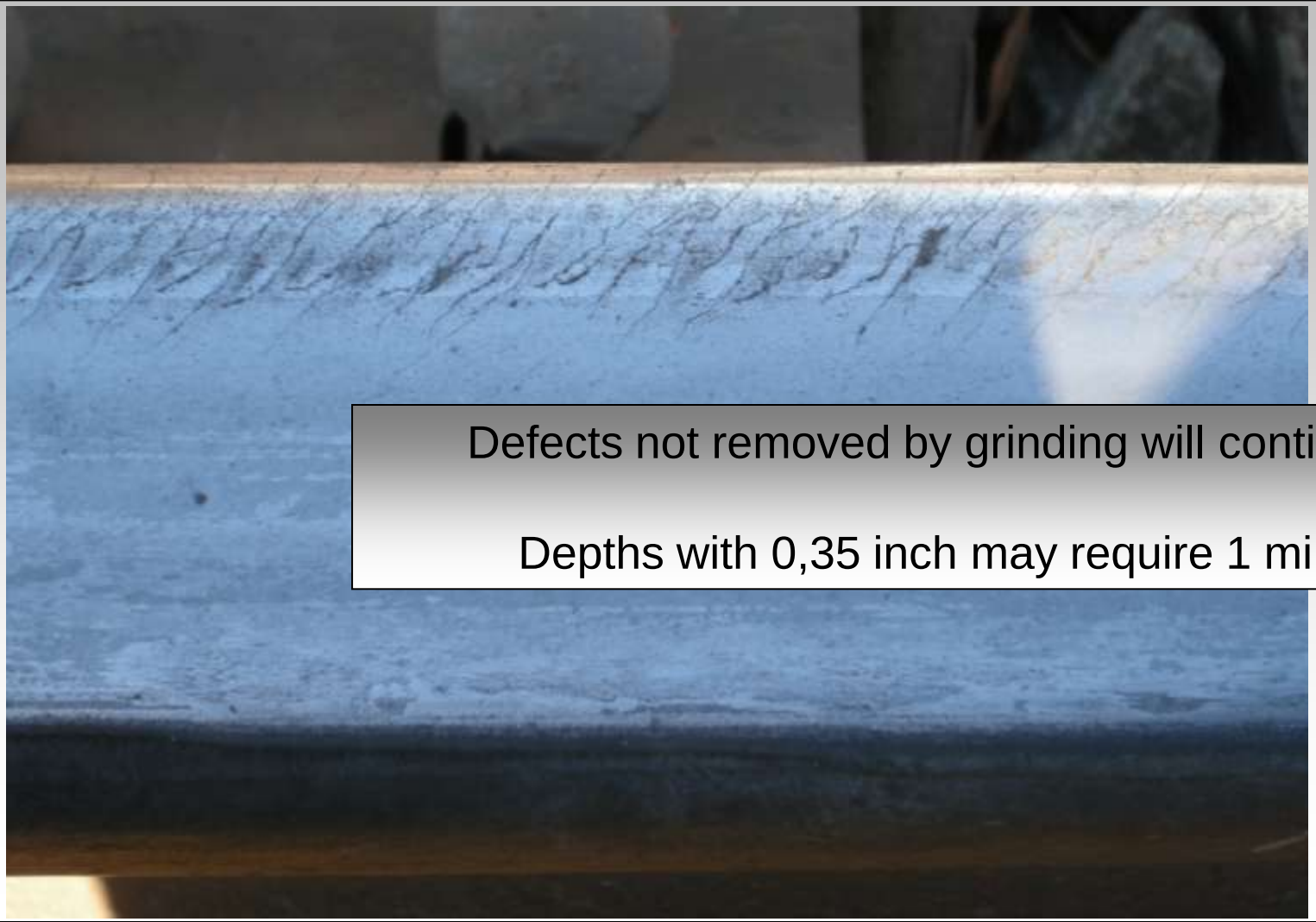
Rail Head defects
defects >0,05 inch depth



Defects not removed by grinding will continue to grow !

Depths with 0,35 inch may require 1 milling pass !

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Rail Head defects
defects >0,05 inch depth

Collateral rail damage resulting from grinder failure to remove defect !

Milling technology may require 1- 2 passes !

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Rail Head defects >0,05 inch depth

With the grinding technology its impossible to eliminate this defects!

The Milling technology requires maximum 1 - 2 passes!

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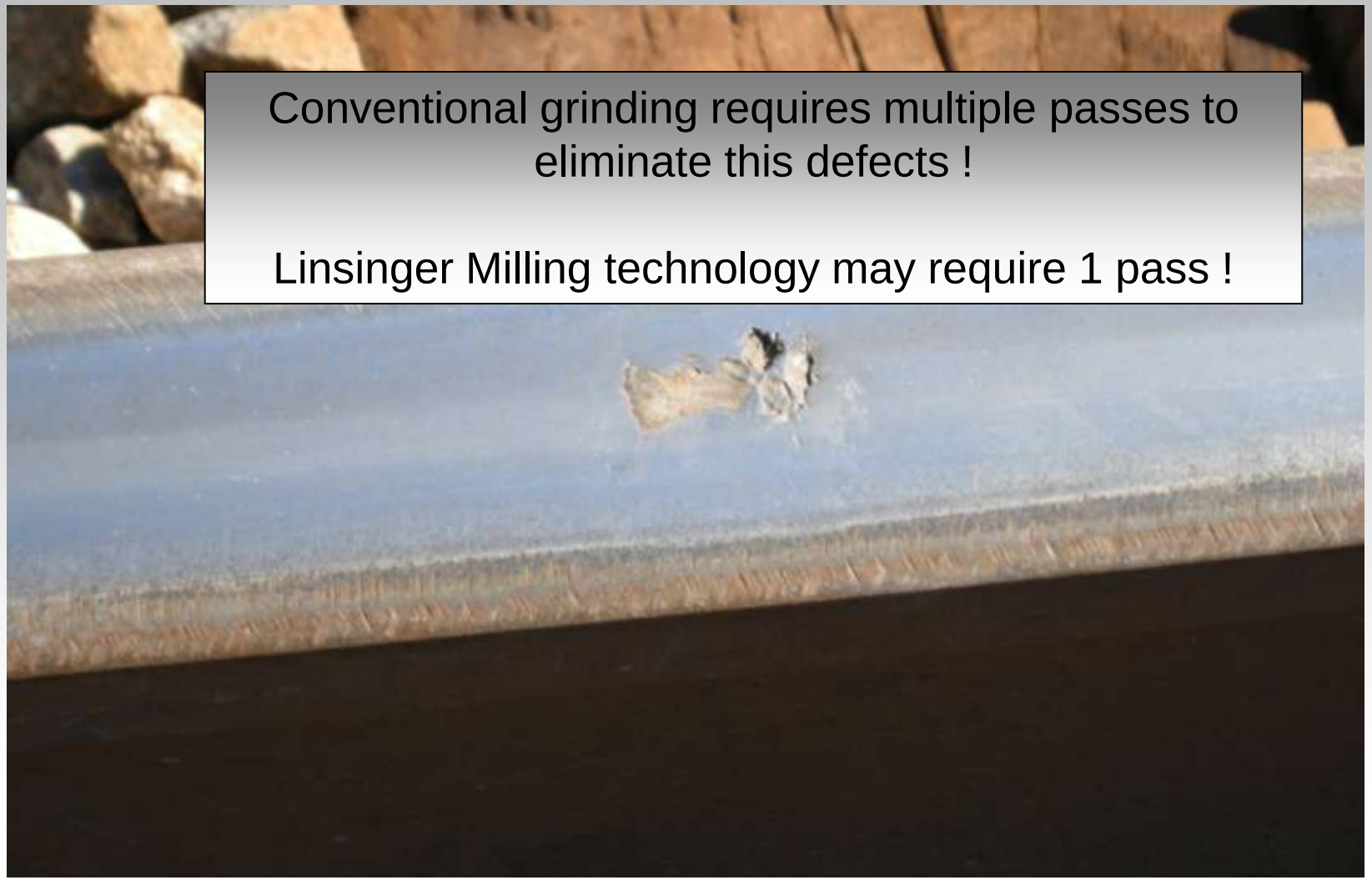
indentation / squats
defects >0,05 inch depth



Conventional grinding requires multiple passes to eliminate this defects !

Linsinger Milling technology may require 1 pass !

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rail after millions of ton´s / 9 month after grinding

Grinding technology requires multiple passes for profiling 45°!

Milling technology requires maximum 1 pass, 90°!

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Rail after millions of ton´s / 9 month after grinding

Milling technology requires maximum 1 pass at 90°!

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RAIL MILLING vs RAIL GRINDING

Activity / Risk	Rail Milling	Rail Grinding
•Hazard : Fire	Low : Tangential spark stream	High : Dry embankments, station invert, debris around point work, water
•Activity : Tunnel Operation / sensitive areas	Ideal m/c can operate	Debris cloud build up, oxygen starvation, fire, residual dust
•Activity : Swarf / debris collection	Very Good : 99 % plus recycle	Poor : Debris to track + Environment
•Risk : Operator / Maintainer / Environment	Good : low dust + vibration	Poor : dust around m/c attaches m/c
•Activity : Tool / stone changing on site	Good : around 15 min. on site	Poor : requires under m/c access
•Risk : Adjacent work groups	Low : can work safely	High : Exclusion zone required (UK)
•Risk : Passing Trains	Very Low : No risk from miller	High : Risk of spark “ingestion”
•Hazard : Noise	Low : Less than 75 dB(A)	High : But cannot stand beside m/c
•Delivery of Profile quality	High : very accurate HSS	Consistency Control : can vary
•Switch and crossing	Same m/c same process	Need specialist m/c

MILLING ADVANTAGES

- ✓ Environment friendly, no emissions, no dust, no dirt, no contamination
- ✓ No handicap of flying sparks
- ✓ No risk of fire, safe operation, no safety risk
- ✓ Useable during the whole year – no restrictions for operation
- ✓ Dry processing, no cooling agents necessary
- ✓ High surface quality with very low roughness
- ✓ Material removal individually from 0.1 mm up to 5 mm
- ✓ Clearance free operation of working units

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MILLING ADVANTAGES

- ✓ High processing speed and High Productivity Rate
- ✓ High accuracy at the rail head for transverse profile at +/- 0,2mm which is European High-speedline Standard
- ✓ High accuracy at the rail head for longitudinal profile at +/- 0,01 at a considered wave length
- ✓ Single pass processing
- ✓ gentle material treatment without chance of metallurgical structure
- ✓ Restoration of any required transverse profile
- ✓ Very low costs per finished metre track

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ACHIEVED TARGETS

- ✓ Considerable increase of life-cycle of the rail
- ✓ High standard of the longitudinal and transverse profile
- ✓ Essential reduction of the wear at the rail head
- ✓ Improvement of the Wheel-Rail-Geometry
- ✓ Reduction of Maintenance Costs and Life-Cycle Costs
- ✓ Reduction of travel noise, increase of travel comfort and safety
- ✓ Benefits in the area of surfacing, energy (fuel) consumption

LINSINGER RAIL MILLING

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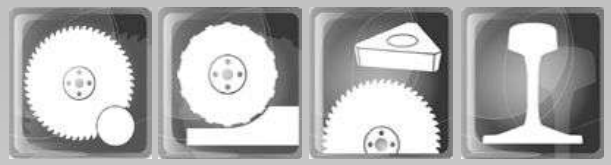

Located in the Centre of Europe

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Company is located in the Centre of Europe in Austria between Salzburg and Linz in the beautiful Salzkammergut!

Visit us ! See how we built machines ! Inspect how we operate them !

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