

Measurement of railhead micro-geometry

SCOOTER



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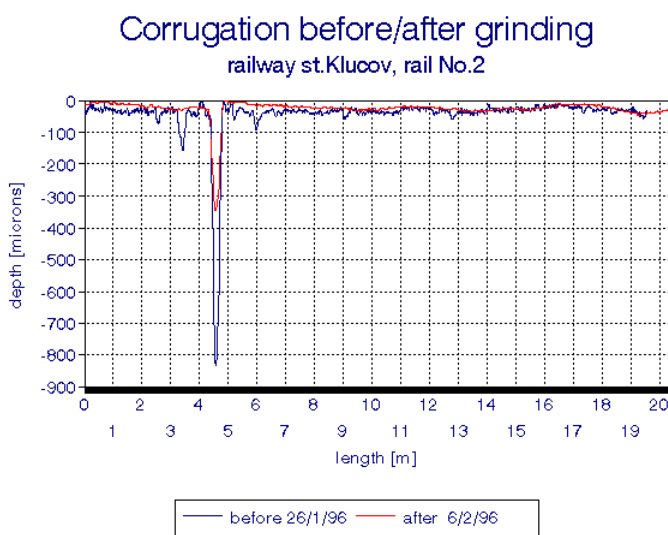
SCOOTER is an electronic measuring device for continual measuring of a railhead surface micro-geometry.

Applications of the SCOOTER:

- rails waviness and slip waves measurement and diagnostics,
- grinding planning and checking up,
- measurement of waved deformations during the rails reception.

The SCOOTER is an electric measuring device for precise measurement of wavy deformations of the rail running surface. Measuring range includes the rails waviness (defects wave length $\lambda = 1-10$ cm) and slip waves in a curve (defects wave length $\lambda = 10-30$ cm). The SCOOTER basic idea is a measuring bar with central sensor usage. The measuring bar is suspended freely in the supporting frame.

The measuring bar guiding parallel with the rail is ensured by two springing suspensions with opposite surface of the micrometric screw. System of those two springing supports and micrometric screw bearing surface makes possible to measure the rail surface microgeometry ± 15 mm by side of the rail longitudinal axis and to catch the three-dimensional development of waviness and slip waves. Small wheels with separated flange no. 1 and 2 equip the support frame. The wheel no. 1 is fitted by incremental sensor (IRC) of a covered distance drive. The telescopic spacer axis with the wheel no. 3 is fixed perpendicularly to the frame. This telescopic axis ensures the wheels no. 1 and 2 permanent contact with the measured rail and thus also measuring

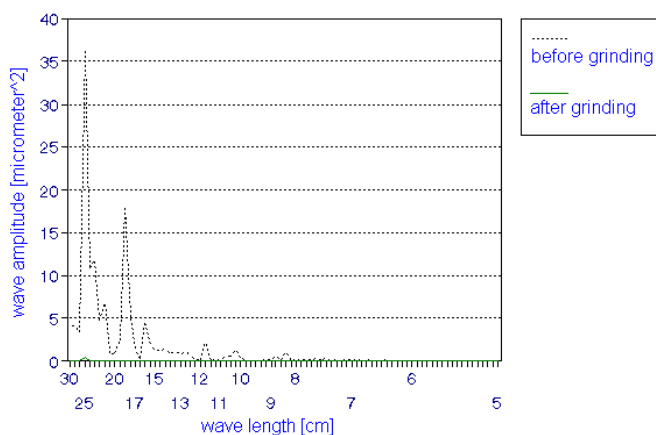


beam repeatability guiding. The telescopic spacer axis is

dismountable and entire measuring system could be transported even in a passenger vehicle. The telescopic spacer axis control (during passing a non-guided place, ...) and lifting of the measuring bar are made by a lever mechanism located directly on the pressure bar handlebar. The measuring system

PSD of corrugation before and after the grinding

section no.1 Klučov, track no.2



could be utilized for both railway and tramway lines. The longitudinal profile of the rail running surface is sampled each 1 to 5 mm. The wavy deformations depth is measured by contact method in the range from 0.001 mm up to 1.0 mm. The measured values (distance and wavy deformations depth) are displayed on the measuring computer LCD display (KOLOB_M.EXE measuring software). The measured data is simultaneously saved on disk and it is prepared for further processing, display and evaluation using the KOLOB_V.EXE software. The KOLOB_V.EXE evaluation software enables displaying up to five diagrams, their comparison, two diagrams coordinates digitalization, editing of measurements description, inserting of measured stage information, passed load, etc.

Evaluating the measurements, the standard deviation of wavy deformations (SDO) and power spectral density (PSD) are calculated as well as comparison with the limit values from the amplitude and SDO criteria point of view. The printed diagrams and tables with measured quantities description covers the evaluation output.

Measurement ranges and precision

The wavy deformations measurement range is 0.001 mm up to 1.0 mm. The sensor resolution is 0.001 mm. Precision of repeated wavy deformations depth measurement is 0.0 mm up to 0.004 mm. The longitudinal profile of a rail running surface (wavelengths of wavy deformations) is sampled each 1 to 5mm with 0.1 % precision. Measuring velocity is 1 km.h⁻¹.

SCOOTER parts

Measuring computer: A standard notebook. Alternatively the industrial HUSKY MP 2500 (processor Intel 386EX, 8MHz, 2 MB DRAM s MS-DOS 6.22, dimensions 242x132x44mm, weight 0,7kg, IP 65, resistance against drop from the height of 1.5m, working temperature from -30°C up to +60 °C).

Serial cable: The three-wire non-standard cable with CANON 9 connectors for the measuring computer and box with the card and power supply interconnection.

Box for the card and power supply: The box contains a card for sensor reading, lead accumulator (for sensors supplying) and recharging module for the lead accumulator capacity indication or for the lead accumulator recharging. There is a switch (red color) on the box for sensors supplying mode or the lead accumulator recharging mode selection. The diodes for the lead accumulator capacity state indication (green = the capacity is sufficient/red = the capacity is not sufficient). The diodes for the lead accumulator charging indication (green = the charging is sufficient/red = the charging is not sufficient). Connector for the notebook net power supply attachment serving the LONG 6V 4Ah lead accumulator charging.

SCOOTER: Measuring bar with guide and lifting facility, beam with wheels, micrometer screw, telescopic axis, handlebar and lever mechanisms for the bar lift and the telescopic axis shift control.

SCOOTER basic technical data:

Electric system supply: leady accumulators (maintenance-free) LONG 6V 4Ah, dimensions 45*70*101mm, weight 0.92 kg. The accumulators ensure 20 hours of measurement per a recharging.

Measuring computer supply: using the batteries in your computer (see your computer manual).SCOOTER total weight: approx. 27.0 kg. Operation: one worker.