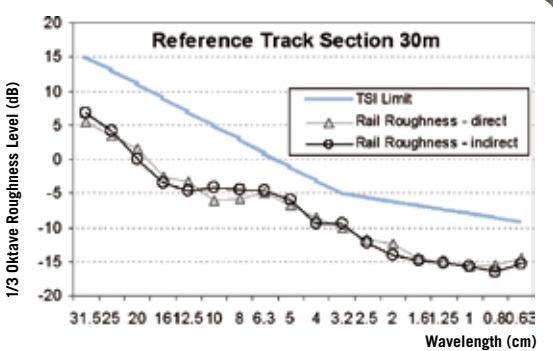


# Roughness Measuring on Rail & Wheel



Roughness measurement on rail lines

## Initial Situation

During normal operation the railway noise is dominated by the rolling noise. The rolling noise is caused essentially by roughnesses of the surfaces of wheel and rail. To calculate noise emissions of a vehicle or a track section the roughness have to be known. A sustaining noise reduction in the railway traffic can take place only by the optimisation and monitoring of roughness. Accordingly EN 15610 the roughness are determined by scanning the surfaces by lasers or displacement sensors. With this procedure wheel roughness must be measured on a vehicle at stand still. The direct measurement of rail roughness is suitable for short track sections only. For long railway lines or whole networks a more efficient method is necessary. The indirect method has to be used, to determine rail or wheel roughness under normal operating conditions calculated from acceleration signals.

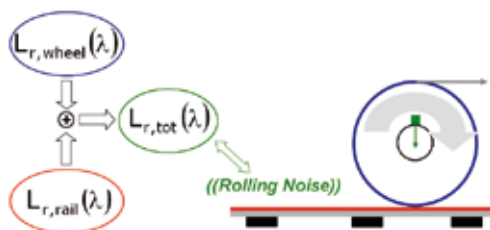


Diagram: Appearance of rolling noise

## Direct Method Realisation

Roughness of wheel and rail can be measured directly by using a flexible applicable precision measuring instrument. To measure the wheel roughness the wheelset must be lifted. The measurements of rail roughness take place without blocking of track sections and without railway traffic interference.

## Indirect Method Realisation

Over acceleration measurements at the rail base or at the axle bearing the sum roughness of wheel and rail can be determined. To determine the unknown roughness in any case one directly measured is needed. Rail roughness measurements by using indirect methods can be performed with speeds up to 80 km/h.

## Customers value

PROSE Ltd. is accredited testing laboratory and has experienced engineers from the adjacent topics in acoustics, railway and mechanical engineering. The roughness measurements on the track take place without traffic interferences. The results are represented in a test report (certificate) and evaluated by experts. On railway lines PROSE efficiently measures the rail roughness continuously by using the indirect method. The investigations on the development and distribution of rail roughness on railway routes can be necessary to localise the factors of influence of noise emission on railways.

Factsheet 10.00044

## Detailed Information

### Roughness measurements according to EN 15610 direct method:

- Rail roughness measurements on a track section – 30 m per hour
- Certification of reference tracks for noise measurements according to TSI Noise
- Wheel roughness measurements on vehicles

### Roughness determination based on indirect method:

- Continuous rail roughness assessment on railway routes – 80 km per hour
- Evaluation of rail roughnesses on track sections concerning rail grinding measures
- Determination of wheel roughnesses of vehicles during pass by

## Project Responsibility

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