



In-track Measuring Instrument for Wheel Profiles on Railway Vehicles

Online laser measuring system for monitoring wheel profiles in-track

- In-track installed online measuring instrument for wheel profiles and diameter
- Easy integration with only slight modifications to the existing rail
- Recording and qualitative evaluation of the complete wheel profile whilst driving over
- Drive over speed up to 20 km/h
- Vehicle detection by transponder
- Immediate determination and display of wear characteristic dimensions
- Wear analysis
- Maintenance forecast
- Can be used for railways and tramways including low-platform vehicles

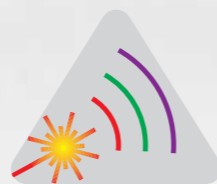
You will find the addresses of our numerous foreign representatives in the Internet.

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In-track measuring instrument for wheel profiles on railway vehicles

Requirements of online wheel profile measurement



Wheels – probably one of the most important units of all rail vehicles, are exposed to high mechanical stress and therefore have a decisive influence on the running behaviour and driving comfort of individual vehicle types. The wheel-rail system, which is subject to extensive demands in service, needs regular inspection to ensure operational reliability. Friction-related mechanical wear on wheel sets is also a cost factor that must not be ignored. Therefore inspection measurements, which at the moment are still done largely by manual methods, must be made at regular intervals. Manual methods are very subjective and reading errors cannot be ruled out.

Stationary wheel profile measuring instrument

Based on these requirements the in-track measuring instrument offers essential advantages for measuring and saves a great amount of time and personnel in the recurrent inspection of wheel profiles.

The recording of profile measured data and the diameter of wheel profiles is ensured for many different types of vehicles and wheel sizes by the laser-supported in-track measuring instrument. The assignment of the nominal and maximum dimensions for the respective profile type and its monitoring is fully database-supported. Measurements on the wheel and assessment of wear can be performed quickly and easily.



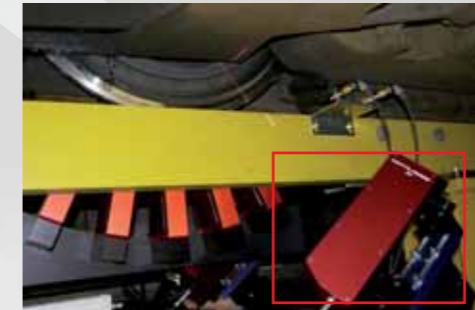
Cost factor wheel profile wear

Long term analysis of the wear dimensions and profile inspections offer assistance in determining low-wear profiles. Optimum operating life of the vehicles (before re-profiling) can be determined based on wear behaviour.

Measuring principle and system concept

The measuring system designed as a compact module consists of two OPTImess 2D laser sheet of light sensors on each side of the rail as well as six OPTImess point laser sensors for measuring the wheel diameter. The laser power is regulated according to the nature of the wheel's surface to enable reliable measurement of different wheel surfaces.

The laser systems are not switched on and the protective slide is not opened until just before the train enters the measuring system so that danger to any persons standing nearby is ruled out. The entire data recording, profile calculation and profile evaluation takes place directly in a special computer integrated into the system on the rail. A standard PC can therefore be used for displaying the measured values and profiles in the control room. Further evaluations are possible within the PC software.



Wheel profile measurement

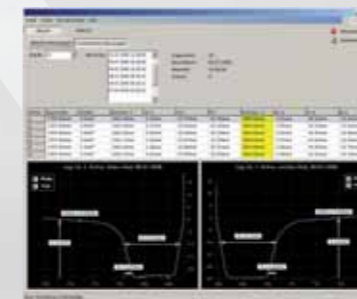
The complete wheel profile is measured by means of two OPTImess 2D laser sheet of light sensors whereby one sensor measures the inside flat surface up to the top of the wheel flange and the second sensor the side of the wheel profile facing the rail. Both partial profiles are joined together in the processing computer and the profile parameters such as SD, SH, qR etc. are determined from this.

Diameter measurement

Six special OPTImess point triangulation sensors in an optimum arrangement are used. The arrangement of the sensors, in connection with special mathematical evaluation algorithms, enables a very accurate and reproducible determination of the wheel diameter. A measurement next to the measuring circle level by the position of the wheel to the measuring system is compensated by the whole profile trajectory.



PC software



The database-supported software enables further evaluation of the profile and diameter data measured on the vehicle. At the same time it enables management of all vehicles and wheel sets. In addition to the basic standard parameters of the profile the complete profile curve is available in graphical form for further wear investigations. All the data can be passed on to a master system (e.g. SAP).

The following standard evaluations are possible:

- wheel flange height, thickness and qR dimension
- wheel width
- back to back distance Ar
- track and guide dimension calculation
- wear history
- limit comparison
- nominal and actual profile comparison
- profile co-ordinates of every wheel
- measurement of wheel diameter
- monitoring of the diameter differences of the wheels on the whole vehicle, the drives and bogies
- interfaces for data transfer with central EDP systems, e.g. SAP
- vehicle detection by transponder

