

## Rail corrugation, acoustic roughness, profiles and planning

### measuring trolley (CAT)



*CAT 3 in use on embedded rail: this equipment can be used on heavily worn, deeply embedded rails as well as on conventional Vignole / flat-bottomed rails*

### vehicle-based instrument (RCA)



*The RCA is usually supplied for routine corrugation measurement on a rail reprofiling train, in particular rail grinders. It has been validated by comparison with a CAT. The equipment can be used during grinding and is sufficiently accurate to show when grinding has been achieved to the requirements of Class 1 of EN13231-3:2006.*

- reliable, portable, robust instrument
- measures flat-bottomed and embedded rail
- operation and transport by one person (<20kg in carrying case with rollers)
- typical measuring speed of 1m/s
- used worldwide by railway workers, consultants, contractors and research workers for
  - ◇ corrugation measurement
  - ◇ quality assurance of reprofiling work to EN13231-3:2006 or the equivalent
  - ◇ measurement of acoustic roughness to EN ISO3095:2005 and EN15610:2009
- sophisticated, simple, robust software

- available for fitting to a reprofiling train or as a self-contained measuring bogie
- typical measuring speed of <10km/h; higher speed possible for survey work
- simple superposition of pre- and post-grind measurements to produce QA reports
- clear indication possible during reprofiling of whether further work is required to meet a specification
- accuracy of microns, measured relative to CAT
- well proven in service
- robust and reliable in operation: RCAs have operated for years with minimal maintenance, yet still measure to micron

***Clients who use or have used our equipment for research include Chalmers, ISVR, IRT (Monash), Portec / Kelsan, SWJTU, UP Valencia, University of Queensland***

# RailMeasurement

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### hi-rail equipment (MSRCA)



The MSRCA is mounted on a hi-rail and designed to measure corrugation, particularly long wave (150-1500mm) to an accuracy of microns at a speed of tens of km/h for routine corrugation surveys and planning of rail grinding.

- suitable for routine corrugation surveys of a railway system from a hi-rail vehicle
- current measuring speed of >20km/h; design speed of >35km/h
- accuracy of microns

#### software

- analysis and presentation of transverse profile measurements e.g. on reprofiling train or recording vehicle
- production of summary values of “Grinding Compliance Index” and “Rail Quality Index”
- intuitive, inexpensive software to assist maintenance planning

### “noise mapping” and corrugation survey of a railway system (HSRCA)



The HSRCA is based on axlebox accelerometers mounted on a service coach or track recording vehicle. Tests have demonstrated that measurements of acoustic roughness made at 100+km/h correlate within several dB with measurements made using either a CAT or a manual straight-edge instrument.

- reliable, well proven system based on axlebox accelerometers
- calibrated over a test site measured with CAT or straight-edge based instrument according to protocol in EN15610:2009
- measurement at line speed
- can be fitted to a slightly modified service vehicle
- output of
  - severity of corrugation
  - severity of discrete irregularities (welds etc)
  - one-third octave spectra

*Our clients include Alstom, ARTC, Banverket, Citirail, Corus, MTRC (HK), London Underground, Loram, QR, Schweerbau, Sumitomo, Tokyo Metro, TTC, Wiener Linien*

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