ISO TC31/WG11
Amendment to ISO 13325 including measurement uncertainties

Information for UN/GRBP/IWGMU

Background and proposal

- ISO TC31 WG11 has revised the ISO 13325, published in 2019
- In 2020, WG11 designed an amendment including measurement uncertainties in the standard, based on documents presented to IWG MU by ETRTO
- After ISO authorization (CIB) of work, DIS ~ready to be submitted for ballot.
- Variability of measurement results for a coverage probability of 95%:

Tyre category	Run-to-run dB (A)	Day-to-day dB(A)	Site-to-site dB(A)
C1, C2 tyres	±0.3	±0.6	±2.2
C3 tyres	±0.3	±0.8	±2.3

Current uncertainty budget

Uncertainty category	Systematic or Random	Standard Uncertainty 95% conf. int.	Description
Test Repeatability (day by day)	Random	± 0.6 (b)	Result variability once tires, track, acquisition system, vehicle and modus operandi are the same (Day and driver might be different)
Test Repeatability (run to run)	Random	± 0.3 (b)	Result variability for consecutive test once tires, track , acquisition system, vehicle and modus operandi are the same
Speed effect	Random	± 0.13	Minimum requirement for sensor accuracy in ISO 13325 is +/- 1kph- Tire noise vs speed sensitivity= 0.2 dB/kph. Peak to Peak = 0.2 dB * 2 kph = 0.4 dB (+/-0.13 dB for 95% coverage).
Temperature influence (after temp. correction)	Random	± 0.3 (b)	Despite temperature correction a residual error remains (formula not fully correct). Only applicable for C1/C2 tires.
Temperature influence (without temperature correction)	Systematic	± 0.6	The systematic error is removed in ISO 13325 except for C3. ISO 13325 allows following temperature ranges: air from 5 to 40 degrees C, surface temperature from 5 to 50 degrees C. Estimated peak to peak ISO 13325 formula = 1.8 dB (+/- 0.6 Db for 95% coverage)
Track to Track	Systematic	± 1.8 (a)	Estimated by VDA round robin test results (see [2])
Sound meter to sound meter	Random	± 0.4 (a)	Measurement system shall meet class 1 requirements (see IEC 616721)
Vehicle influence	Systematic / Random	±1.0 (b)	Possibility to use different vehicles. Uncertainty takes into consideration differences on: Wheel adjustment, suspension, tyre load and inflation, body-road clearance, shadowing and reflecting properties, rim, transmission noise, bearings, brake noise (brakes not fully released), Body shape, aerodynamic noise around vehicle body & extra equipment

(a) Values retrieved in literature (b) Estimation based on experience of ISO TC31 WG11 experts, based on tyre makers data

Thanks for your attention