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Master ISO-Road (MISOR)

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09.11.2023

Background for starting Master ISO-Road (MISOR)

UN R 51.03	To full fill phase 3 pass-by levels quieter tyres are required.
Interests of OEMs and tyre manufacturers	A contractual requirement for tyre noise level is important for OEMs and tyre manufacturer.
Know how	In spite of latest revisions of ISO10844, different ISO-tracks provide a large spread of tyre road noise levels.
Necessity	This track influence on tyre road noise must be considered.

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What is MISOR?

- A measurement campaign of tyre road noise and track properties with identical tyres, vehicles , measurement system and crew on different tracks.
- A measurement and analysis process for tyre road noise focused on UN R51.03 and UN R117.
- A procedure to calculate a track dependent correction factor, that allows to compare tyre road noise results of different tracks.
- Definition of a virtually reference track.

Small project is growing fast

- **2020: Kickoff by Audi/Porsche/VW with 6 internal tracks**,
  2 tyre noise test cars, 4 sets of summer tyres + SRTT + slick

- Measurements made by SGS-TÜV Saar GmbH with Müller BBM pass-by software

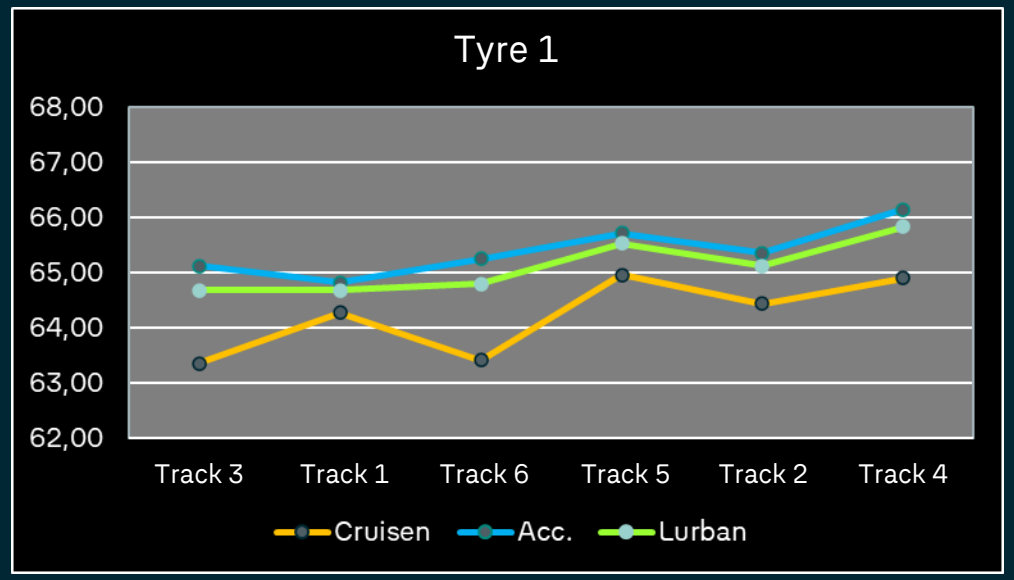
- Measured data:
  - Tyre road noise constant @ 20, 40, 45, 50, 55, 6, 70, 80, 100 km/h
  - Tyre road noise accelerated @ 1,5-2,5 m/s² in 0,1 m/s² steps
  - Sound absorption and average mean profile depth (MPD)

- **2021: VW group tyre noise measurement specification**, exchange with tyre manufacturer

- **2022: 17 tracks and 3 renovated tracks measured**

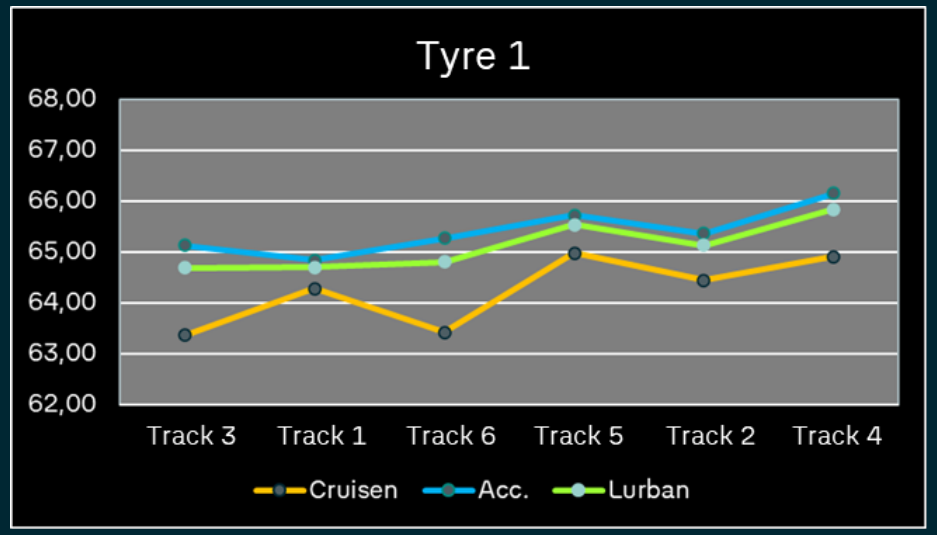
- **2023: additional track parameters needed for more precise calculation**

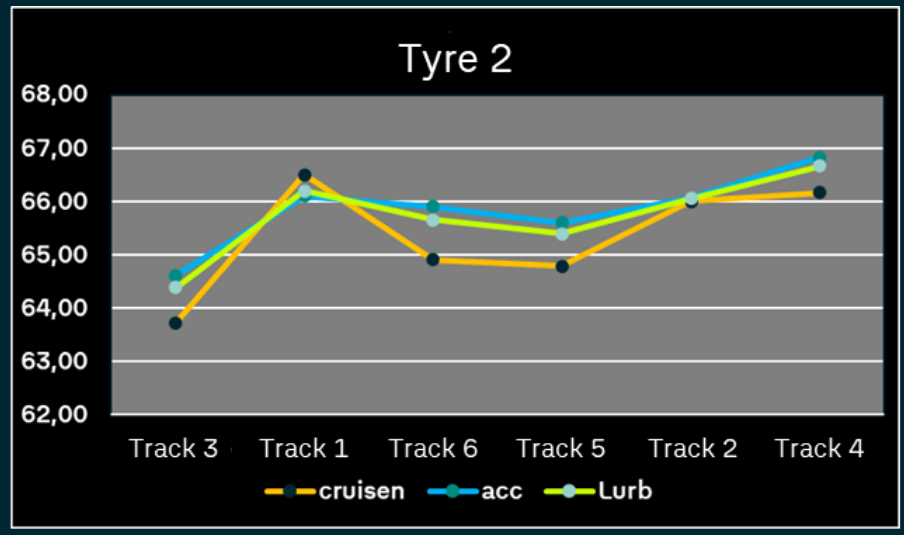
$L_{urban,tyre} = 0{,}75\ L_{acc,tyre} + 0{,}25\ L_{const,tyre}$ as basis for reference track level

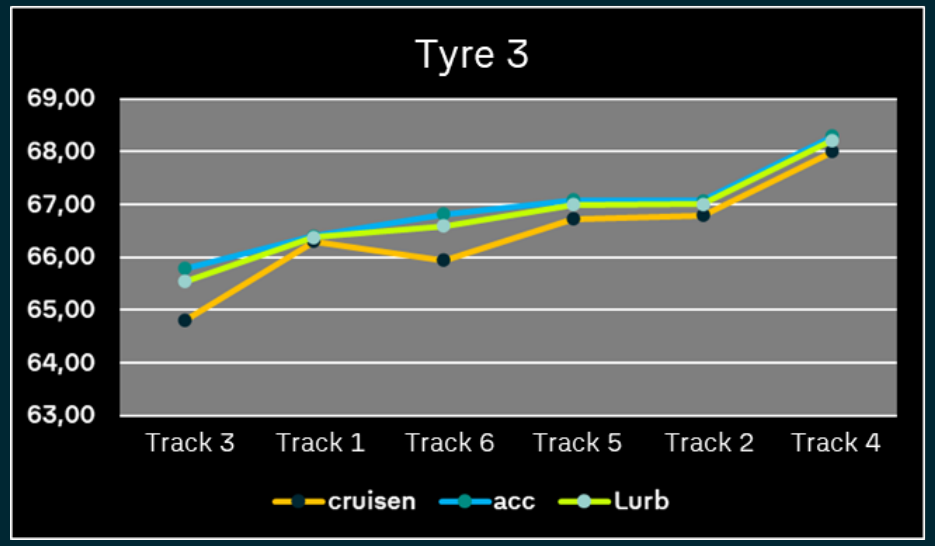


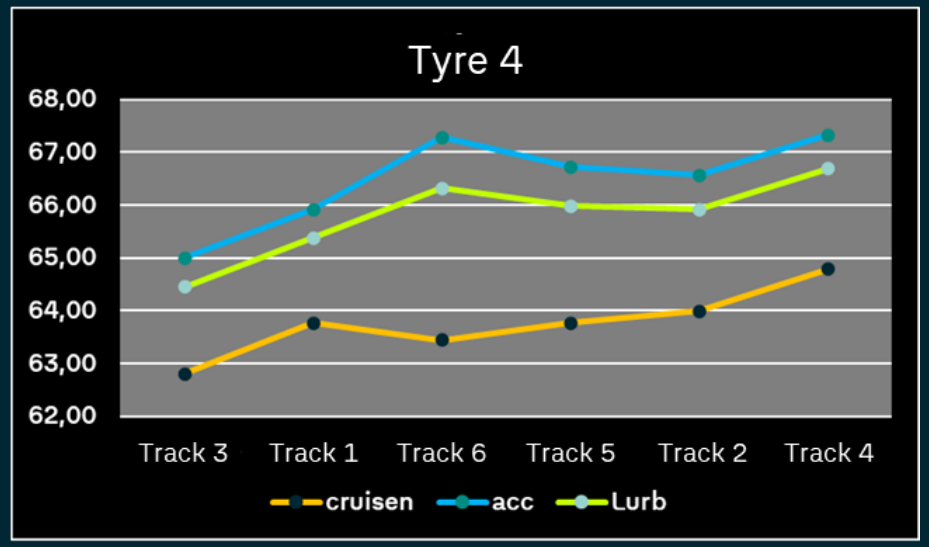
SPL in dB(A)	Tyre 1			Tyre 2			Tyre 3			Tyre 4		
	cruisen	acc	Lurb	cruisen	acc	Lurb	cruisen	acc	Lurb	cruisen	acc	Lurb
Track 3	63,36	65,13	64,7	63,73	64,61	64,4	64,80	65,78	65,5	62,80	65,00	64,5
Track 1	64,28	64,83	64,7	66,50	66,10	66,2	66,30	66,40	66,4	63,77	65,92	65,4
Track 6	63,42	65,26	64,8	64,91	65,90	65,7	65,94	66,81	66,6	63,44	67,28	66,3
Track 5	64,97	65,72	65,5	64,79	65,60	65,4	66,72	67,08	67,0	63,77	66,72	66,0
Track 2	64,44	65,36	65,1	66,00	66,07	66,1	66,79	67,07	67,0	63,99	66,56	65,9
Track 4	64,91	66,15	65,8	66,16	66,83	66,7	68,00	68,29	68,2	64,79	67,32	66,7

High differences tyre to tyre and track to track









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Results and next steps

Track Number	1	1 new	2	3	3 new	4	5	6	6 new	7	7 new	8	9	10	11	12	13	14	15	16	17
MISOR factor	+1,0	+0,6	-1,1	-0,2	-2,0	0,0	+0,1	+0,2	-2,3	-0,1	-1,2	+0,5	+0,1	-0,4	+0,8	0,0	+1,3	+0,9	+0,8	-0,8	+1,7
Date	2020	2022	2020	2020	2022	2020	2020	2020	2023	2022	2023	2020	2021	2021	2021	2021	2021	2021	2021	2022	2021

- Additional tracks will be included
- More investigation of track parameters e.g. project TyRON
- First steps to bring the procedure to standardization and regulation
- Everybody welcome to join