Submitted by the expert of ISO

Informal document **GRB-75-02-Rev.1-Add.1**
75th GRBP, 8-11 February 2022,
Agenda item 2,3, and 4(d)
Companion document to GRBP-75-02-Rev.1

ISO 10844:2021 technical changes and benefits

Track measurement methods

- **Updated technical methods**: ISO 10844:2021 permits updated modern and accurate methods of measurement; for example, laser methods in addition to straightedge.
- **Reduced interpretation variation:** More specific detail about test methods in order to reduce variability on how specifications are understood.
- **Reduction in track to track variation:** More repeatable and reproducible conformity assessment measurement efficiency and **better accuracy**.
- **Benefit: Reduced track-to-track variability thanks to better accuracy**.

Main changes and benefits

Technical Criteria	*Improvements in ISO 10844:2021*	*Benefit*
Step requirement	Implement a step requirement that includes allowance for a step-up of maximum 5 mm to harmonize with irregularity requirement. Acoustical analysis of potential shielding found negligible impact.	Improved constructability while maintaining same surface geometric tolerances.
Sampling for aggregate grading	Sampling of loose asphalt mixture as alternative to coring for evaluating aggregate grading.	Sampling of loose asphalt mixture more representative of the track, potentially reducing track to track variation.
Irregularity requirement for track testing trucks only	Requirement increased to 10 mm in consideration of permanent deformation caused by heavy vehicles. Acoustical analysis of potential shielding found negligible impact.	Improved durability of tracks used exclusively for heavy vehicles with-out impacting acoustical measurement.

Main changes and benefits

Technical criteria	***Improvements in ISO 10844:2021***	***Benefit***
Additional and optional calculation	Replace optional calculation of ENDt (never used) with optional calculation of texture skewness, shape factor (g-factor), and texture spectrum.	Skewness, shape factor (g-factor), and texture spectrum reported to correlate with measured pass-by noise and are proposed for track correlation methods reducing measurement uncertainties.
Examples of track construction	Examples have been removed.	Avoided conflicts and confusion in interpretation of the technical requirements in the standard.

Example: Sieving curves

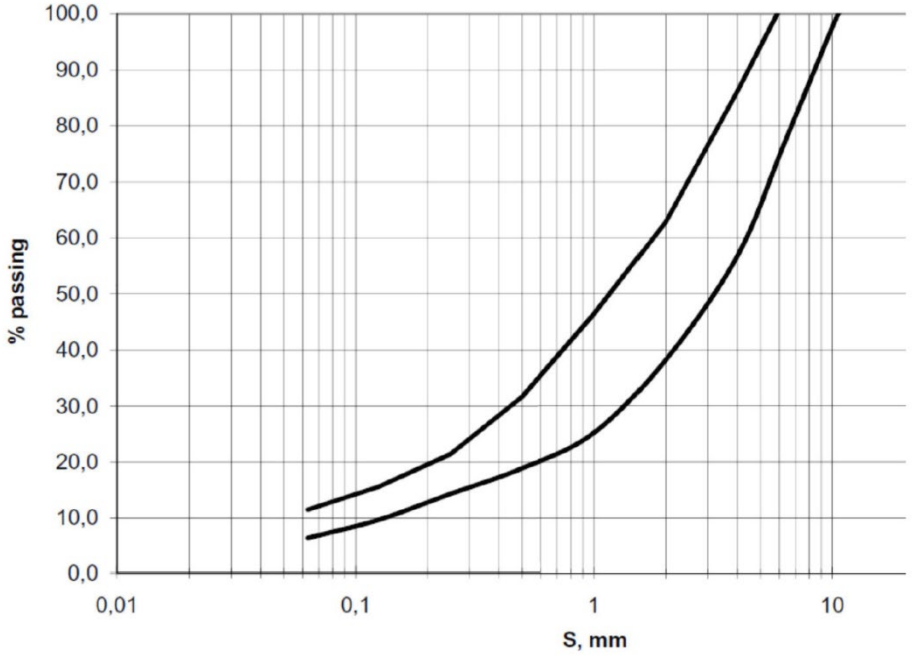

Figure 4 — Sieving curve area

Table 2 — Aggregate grading envelope

Sieve size mm	Aggregate grading envelope requirement %
Sieve category 1	
14,0	100
13,2	100
12,5	100
11,2	100
Sieve category 2	
10,0	100
9,5	95 to 100
8,0	86 to 100
6,7	79 to 100
6,3	76 to 100
...	
Sieve category 5	
0,63	20 to 37
0,60	20 to 36
0,50	18 to 32
0,425	17 to 30
0,315	15 to 25
0,30	15 to 25
0,25	14 to 22
Sieve category 6	
0,16	11 to 18
0,15	10 to 18
0,125	9 to 16
0,10	8 to 15
0,080	7 to 13
0,075	7 to 13
0,063	6 to 12

- Change: Graphs to table.
- Advantage: No curve interpretation results in **better accuracy**.
- **Benefit:** Reduced track-to-track variability caused by subjective interpretation of sieving curve figure.

Summary

- ISO 10844:2021 will not change the current sound emission measurement level
- ISO 10844:2021 will improve measurement uncertainty.
- ISO proposal is to include the revised version of ISO 10844 standard in relevant regulations, namely:
  - R51
  - R117
  - R138
  - Other regulations
- Request GRBP opinion to prepare formal documents for each relevant regulation for 2022 September GRBP.