

Proposal for amendment to Regulations No. 51, 117, 138

The proposed amendments are marked in bold or strikethrough for new characters. Regulation 51 test is used as

I. Proposal

Regulation 51: Paragraph 2.1.1, Annex 3., amend to read:

“2.1.1. Test Site Outdoor

The surface of the test track and the dimensions of the test site shall be in accordance with ISO 10844:~~2014~~ **2021**.

The surface of the site shall be free of powdery snow, tall grass, loose soil or cinders. There shall be no obstacle which could affect the sound field within the vicinity of the microphone and the sound source. The observer carrying out the measurements shall so position himself as not to affect the readings of the measuring instrument.

Measurements shall not be made under adverse weather conditions. It shall be ensured that the results are not affected by gusts of wind.

The meteorological instrumentation should be positioned adjacent to the test area at a height of 1.2 m ± 0.02 m. The measurements shall be made when the ambient air temperature is within the range from 5 °C to 40 °C.

The tests shall not be carried out if the wind speed, including gusts, at microphone height exceeds 5 m/s, during the sound measurement interval.

A value representative of temperature, wind speed and direction, relative humidity, and barometric pressure shall be recorded during the sound measurement interval.

Any sound peak which appears to be unrelated to the characteristics of the general sound level of the vehicle shall be ignored in taking the readings.

The background noise shall be measured for duration of 10 seconds immediately before and after a series of vehicle tests. The measurements shall be made with the same microphones and microphone locations used during the test. The A-weighted maximum sound pressure level shall be reported.

The background noise (including any wind noise) shall be at least 10 dB(A) below the A-weighted sound pressure level produced by the vehicle under test. If the difference between the ambient noise and the measured sound is between 10 and 15 dB(A), in order to calculate the test results the appropriate correction shall be subtracted from the readings on the sound-level meter, as in the following table:

<i>Difference between ambient noise and sound to be measured dB(A)</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>
Correction dB(A)	0.5	0.4	0.3	0.2	0.1	0.0

Regulation 117: Paragraph 2.1, Annex 3., amend to read:

“2.1.1. Test Site

The test site shall consist of a central section surrounded by a substantially flat test area. The measuring section shall be level; the test surface shall be dry and clean for all measurements. The test surface shall not be artificially cooled during or prior the testing.

The test track shall be such that the conditions of a free sound field between the sound source and the microphone are attained to within 1 dB(A). These conditions shall be deemed to be met if there is no large sound reflecting objects, such as fences, rocks, bridges or building within 50 m of the centre of the measuring section. The surface of the test track and the dimensions of the test site shall be in accordance with ISO 10844:~~2014~~**2021**. Until the end of the period indicated in paragraph 12.8. of this Regulation the specifications for the test site may be in accordance with Annex 4 to this Regulation.

A central part of at least 10 m radius shall be free of powdery snow, tall grass, loose soil, cinders or the like. There shall be no obstacle, which could affect the sound field within the vicinity of the microphone and no persons shall stand between the microphone and the sound source. The operator carrying out the measurements and any observers attending the measurements shall position themselves so as not to affect the readings of the measuring instruments.

Regulation 138: Paragraph 2.1.2, Annex 3., amend to read:

2.1.2 Outdoor testing

The test site shall be substantially level. For the measurement of vehicles in motion, the test track construction and surface shall meet the requirements of ISO 10844:~~2014~~**2021**. For the measurement of vehicles at a standstill, the test area shall be either:

- (a) ISO 10844:~~2014~~**2021**; or
- (b) Other dense asphalt; or
- (c) Dense concrete.

Within a radius of 50 m around the centre of the track, the space shall be free of large reflecting objects such as fences, rocks, bridges or buildings. The test track and the surface of the site shall be dry and free from absorbing materials such as powdery snow, or loose debris.

In the vicinity of the microphones, there shall be no obstacle that could influence the acoustic field and no person shall remain between the microphone and the noise source. The meter observer shall be positioned so as not to influence the meter reading. Microphones shall be located as specified in Figures 1 of the Appendix to this annex.

ISO also proposes that GRBP consider transitional provisions regarding the use of ISO 10844:2021 in UN regulations.

From entry into force, ISO 10844:2021 shall be accepted for all approvals granted under this regulation. Until [5] years from entry into force, ISO 10844:2014 shall be accepted for all approvals granted under this regulation.

II. Justification

ISO has updated the 10844 standard to improve clarity. The primary objective is to reduce track-to-track variability caused by differing interpretations and implementations of the technical requirements.

The following table includes other improvements that have been made.

Third edition ISO 10844:2014 technical method	Improvements in ISO 10844:2021	Effect of improvements
Measurement of irregularity	Permit more modern and accurate methods of measurement (e.g. laser methods) in addition to straightedge	Improved practicality and accuracy of irregularity measurement
Periodic check criteria for irregularity of tracks exclusively for testing heavy vehicles	Irregularity requirement changed to 10 mm in consideration of permanent deformation caused by heavy vehicles, and through acoustical analysis of potential shielding found negligible impact	Improved durability of tracks used exclusively for heavy vehicles without impacting acoustical measurement
Step requirement	Implement a step requirement that includes allowance for a step-up of maximum 5 mm to harmonize with irregularity requirement	Improved constructability while maintaining same surface geometric tolerances
Sieving curve	Replace sieving curve figure with equivalent tabulation of sieve values defining an aggregate grading envelope	Reduced track-to-track variability caused by subjective interpretation of sieving curve figure
ENDt method	Replace optional calculation of ENDt 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
Sampling for aggregate grading	Sampling of loose asphalt mixture as alternative to coring for evaluating aggregate grading	Sampling of loose asphalt mixture is more practical and representative compared to the small sample extracted from four cores
Examples of track construction	Examples have been removed	Avoided conflicts and confusion in interpretation of the technical requirements in the standard