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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 14892-2006

Replacing GB 14892-1994

**Noise limits and measurement methods for urban rail transit
trains**

城市轨道交通列车噪声限值和测量方法

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1 Scope

GB 14892 sets the noise limits for metro and light rail trains and the methods for measuring them, inside the driver's cab and inside the passenger saloon, together with the requirements for the test report. It fixes the running conditions under which the measurement is made and the instrumentation, so that figures from different lines and different builders are comparable - which matters because interior noise is one of the acceptance criteria when a city takes delivery of a fleet. It replaces GB 14892-1994 and GB/T 14893-1994. Issued on 7 February 2006, in force since 1 August 2006. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the edition it replaces are taken from there. The clause text, the tables and the numeric limits are not reproduced on this page - they are in the document itself, which is delivered in full in English translation.

This standard specifies the main contents of noise limits, measurement methods, test reports for urban rail transit. This standard applies to the design, manufacture, inspection of subway and light rail trains in urban rail transit systems.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, subsequent amendments (excluding errata) or revisions are not applicable to this standard. However, parties agreeing to this standard are encouraged to investigate the possibility of using the latest versions of these documents. For undated references, the latest version applies.

GB/T 3785 Electric, sonic properties and measuring methods for sound level meters

GB/T 8170 Rules for rounding off of numerical values

GB/T 15173 Sound calibrators

GB/T 17181 Integrating-averaging sound level meters

3 Terms and definitions

The following terms and definitions apply to this standard.

3.1 Equivalent sound pressure level L_{eq} , L_{Aeq} , T If, within a specified time, the A-weighted sound pressure of a continuous steady-state sound has the same mean-square A-weighted sound pressure as time-varying noise, then the sound level of this continuous steady-state sound is the equivalent sound level of this time-varying noise. Note

1. The unit of equivalent sound level is decibel (dB). Note

2. The calculation of equivalent sound level is shown in formula (1). Where. L_{Aeq} , T - Equivalent sound level, in decibel (dB); $t_2 - t_1$ - Specified time interval, in second (s); $P_A(t)$ - Instantaneous A-weighted sound pressure, in Pascal (Pa); P_0 - Reference sound pressure (20 μ Pa). Note

3. When A-weighted sound pressure is expressed as A-weighted sound level L_{PA} (dB), the calculation formula is shown in formula (2). [GB/T 3947-1996, Definition 13.7]

3.2 Background noise When the train's operating position is far from the measuring point, meanwhile the effect of train operating noise can be ignored, environmental noise is not considered.

3.3 Vehicle A single-unit passenger train that uses wheel-rail load support, has traction power or no traction power, can be assembled into a train.

3.4 Set of cars A combination of vehicles arranged into fixed basic operating units, capable of operating independently on tracks.

3.5 Train An assembly of one or more sets of cars assembled for the purpose of operating on an operational line.

3.6 Maximum running speed The highest speed permitted for train operation.

3.7 Monitoring test A test conducted for product quality supervision, acceptance, manufacturer self-inspection.

4 Noise limit requirements

The maximum permissible limit for the equivalent sound level (L_{eq}) of subway and light rail trains in urban rail transit systems shall comply with the requirements of Table 1.

5 Measurement method

5.1 Measured quantity The measured quantity is the equivalent sound level L_{eq} in the fast (Fast) range under specified measurement conditions inside the vehicle and outside the train.

5.2 Measuring instruments

5.2.1 Measurement shall be performed using a Type 1 integrating sound level meter, whose performance shall comply with the provisions of GB/T 3785 or GB/T 17181. Other instruments with equivalent performance may also be used. The performance of the sound level calibrator shall comply with the provisions of GB/T 15173.

5.2.2 Before measurement, the sound level meter shall be calibrated using a Type 1 sound level calibrator. After measurement, the sound level meter reading shall be checked again using the sound level calibrator; the deviation shall not exceed

0.5 dB; otherwise, the measurement is invalid.

5.2.3 The sound level meter and sound level calibrator shall be verified and qualified by a nationally recognized metrology organization and used within their validity period.

5.3 Aboveground test environment

5.3.1 Measurements shall be conducted on a dry, unfrozen gravel track bed, concrete sleepers, and a straight, seamless track (gradient < 3 per mille, curve radius > 1500 m).

5.3.2 The test shall be conducted on an actual operating line or another line with similar conditions. The track condition shall be well-maintained and meet normal operating requirements.

5.3.3 Measurement sections shall avoid bridges, tunnels, stations, turnouts, passing sections.

5.3.4 Special circumstances shall be described in the test report.

5.4 Underground test environment

5.4.1 The test track shall meet the following requirements.

- a) The test shall be conducted on an actual operating line or another line with similar conditions;
- b) The tunnels and tracks in the test section shall represent the main types of actual operating lines;
- c) The track condition shall be well maintained and meet normal operating requirements.

5.4.2 Measurements shall avoid stations and passing sections.

5.5.1 General requirements

5.5.1.1 Train formation shall meet normal operating requirements. Special formations shall be described in the report.

5.5.1.2 Wheel treads shall be smooth and free of scratches.

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