

Article 3 Noise level measurements must comply with the following regulations:

- I. Measurement Instruments:  
Measurement of noise from 20 Hz up to 20 kHz shall be conducted with type I of sound level meter complying with CNS specifications or IEC 61672-1 Class 1; measurement of noise from 20 Hz up to 200 Hz shall be conducted with any type of sound meter complying with CNS specifications; the said meter shall also comply with the IEC 61260 Class 1 standard.
- II. Measurement Height:
  - A. When the measurement location is outdoors, the sound sensor should be from 1.2 m to 1.5 m above the ground or an extension of the floor slab of the floor on which measurements are performed.
  - B. When the measurement location is indoors, the sound sensor should be from 1.2 m to 1.5 m above the ground or floor slab.
- III. Dynamic Response:  
In general, a noise meter with fast dynamic response should be used. However, a noise meter with slow dynamic response may be employed when the noise from a noise source has little variation, such as the noise from a motor.
- IV. Correction of the Background Noise Level
  - A. The background noise level in a premise where measurements are being performed should differ from the noise level of the noise source being measured by at least 10 dB(A). If the difference is less than 10 dB(A), the noise level of the noise source being measured shall be corrected with below formula or based on attached table.
  - B. Correction formula of the background noise level of noise source being measured:

$$L = 10\log(10^{0.1L_1} - 10^{0.1L_2})$$

L: Refers to the noise level of the noise source being measured.

L<sub>1</sub>: Refers to the overall noise level.

L<sub>2</sub>: Refers to the measured value of background noise level.

- C. The statutory responsible persons or on-site personnel at premises and facilities must cooperate with the measurement of the background noise level, and their influence on the background noise level should be corrected for. When background noise level measurements are performed, and the statutory responsible person or on-site personnel cannot cooperate, then there is no need to correct for the background noise level, and the situation should be noted.
- D. When it is desired to measure the overall noise level of a premise, but the difference from the background noise level is less than 3dB(A), the measurement should be discontinued, and either another suitable measurement location found or the noise from other sources eliminated or reduced before measurements are performed.
- E. When a premise to be measured is a factory (facility) with equipment operating 24 hours a day, and the equipment cannot be stopped to accommodate measurement of background noise level at any time apart from annual maintenance, an annual maintenance background noise level monitoring plan may be submitted to the special municipality, county, or city competent authority; after the special municipality, county, or city competent authority has granted its approval, measurement of the noise level at a location outside the premise's peripheral boundary approved by the special municipality, county, or city competent

authority should be performed for a continuous period of from 24 hours to 72 hours during annual maintenance. The results should be reported to the special municipality, county, or city competent authority for approval, and shall provide a basis for correction for the background noise level when measurements of noise within a frequency range of from 20 Hz up to 20 kHz are performed at any place outside the peripheral boundary of the factory (facility) within two years of the date of approval.

V. Testing time period:

Perform measurements at times when the emission of noise is most representative or that have been designated by the complainant.

VI. Testing Location:

A. When measuring noise in a frequency range of from 20 Hz up to 20 kHz at sources of factory plants or sites, entertainment premises, business premises, construction projects or other premises or facilities (excluding the wind power generation units) announced by the competent authority, measurement shall be taken at locations designated by a complainant as his or her living place. In case the complainant does not designate his or her living place for the measurement, the measurements shall be performed at any place specified by the competent authority outside the peripheral boundary of a factory plants or sites, entertainment premises, business premises, construction projects or premises, or facilities (excluding the wind power generation units) announced by the competent authority; measurements shall be taken at points at least one meter from the wall of the nearest building.

B. When measuring noise in a frequency range of from 20 Hz up to 20 kHz at sources of wind power generation units, measurement shall be taken at locations designated by a complainant as his or her living place.

Measurements shall be taken at points at least one meter from the wall of the nearest building; indoor doors and windows shall be kept shut during the re-examination measurement of overall noise level, and be opened in other conditions; other noise sources that will influence measurement results shall be turned off during the measurement.

C. When measuring noise in a frequency range of from 20 Hz up to 200 Hz at sources of factory plants or sites, entertainment premises, business premises, construction projects or other premises or facilities, measurement shall be taken at locations designated by a complainant as his or her living place.

Measurements shall be taken at points at least one meter from the wall of the nearest building. However, this restriction shall not apply if it is desired to perform measurements with no obstructions between the noise source and sound sensor. Indoor doors and windows shall be kept shut; other noise sources that will influence measurement results shall be turned off during measurement.

D. When measuring noise at a public address facility, if the noise source at the public address facility has a horizontal projection distance of three meters or more, the measurements should be performed at a location designated by the competent authority. If a mobile public address facility is moving at the time, the measurements should be performed at a location designated by the competent authority and no less than three meters from the mobile noise source at its closest approach.

VII. Weather Conditions

Measurements shall be taken in days without raining and the wind speed shall not be greater than 5 meters per second. However, this

restriction shall not apply to measurements taken indoors.

VIII. Operating Conditions of the Noise Generating Source:

- A. During the measurement, the statutory responsible persons or on-site personnel at premises or facilities shall provide information on the operating status of the noise generating source for competent authority to examine and record.
- B. In case the operating status of noise generating source at premises and facilities that must make improvement within a time limit is different from the initial test, it is a must to request the parties to adjust it to the same condition as they had during the initial test before implementing the re-examination. However, this restriction shall not apply to operators, who consider the changes of operating conditions of the noise generating source as the improvement measure and who promise to follow them in the future.

IX. Evaluation Methods

- A. Sources of factory plants or sites, entertainment premises, business premises or other premises or facilities (excluding the wind power generation units) announced by the competent authority shall calculate the maximum noise level ( $L_{max}$ ) or equivalent noise level ( $L_{eq}$  or  $L_{eq,LF}$ ) on the basis of the following noise source emission characteristics and the results shall not exceed the values in the noise control standard table:
  1. If the noises caused by periodical or intermittent variation has a 10 dB(A) difference above the background noise level and has shown the maximum noise level no more than 5 dB(A), it is a must to calculate the averaged maximum noise level ( $L_{max}$ ), which are consecutively measured ten times. Diagram 1 has shown the noise with periodical variation, where its cycle of producing sound is fixed; as for Diagram 2, it has shown the noise with intermittent and regular variation, where its maximum noise level is mostly fixed. Therefore, one shall measure its maximum noise level totally ten times and calculate the averaged noise level.
  2. If the noises caused by periodical or intermittent variation has a 10 dB(A) difference above the background noise level and has shown the maximum noise level no more than 5 dB(A), one shall measure at least 20 maximum noise levels ( $L_{max}$ ) to calculate the percentile noise level  $L_5$ .
  3. Noises with non periodical and intermittent variations are expressed using equivalent noise level. Continuous measurement sampling time must be at least two minutes, and sampling intervals may not be greater than two seconds. For instance, in Diagram 3, when the noise meter's reading is constant, or the needle only changes by 1-2dB(A), the results are expressed using equivalent noise level. In Diagram 4, when the sound volume and interval of occurrence are irregular, the results are also expressed using equivalent noise level.



■ Diagram 1

Diagram 2

Diagram 3

Diagram 4

- B. Regarding noise generating source at construction projects or other sites announced by the competent authority, the continuous measurement sampling time must be at least two minutes, and sampling intervals may not be greater than two seconds. Besides, the results of maximum noise level ( $L_{max}$ ) and

equivalent noise level ( $L_{eq}$  and  $L_{eq,LF}$ ) during the measurement time shall not exceed the noise control standard value.

- C. With regard to assessment methods for noise from public address facilities, the maximum noise level ( $L_{max}$ ) or equivalent noise level ( $L_{eq}$ ) shall be calculated on the basis of the following noise source emission characteristics, and the results shall not exceed the noise control standard value:
  - 1. In the case of mobile public address facilities, the maximum value ( $L_{max}$ ) at the time the facility passes shall determine noise level.
  - 2. In the case of stationary or currently stopped public address facilities, the noise level shall be expressed as equivalent noise level ( $L_{eq}$ ). Continuous measurement sampling time must be at least two minutes, and sampling intervals may not be greater than two seconds.
- D. With regard to evaluation method for noise from wind power generation units, the results shall be expressed in equivalent noise level ( $L_{eq}$ ). Continuous measurement sampling time must be at least two minutes, and sampling intervals may not be greater than two seconds.