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

**GB/T 23281-2009**

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**Metal forming machinery -- Noise measurement method of  
sound pressure levels**

锻压机械噪声声压级测量方法

**(English Translation)**

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### 1 Scope

This standard specifies the measurement instruments, test environment, measurement conditions, measurement methods, etc. for the noise sound pressure level of forging machinery.

This standard applies to the A-weighted measurement of noise sound pressure level at the operating position and specified position of the forging machinery.

### 2 Normative references

The clauses in the following documents become clauses of this standard through reference in this standard. For dated references, all subsequent Amendments (excluding errata content) or revisions do not apply to this standard, however, parties to agreements based on this standard are encouraged to study is the latest version of these files available. For undated references, the latest edition applies to this standard.

GB/T 3102.7 Acoustic Quantities and Units (GB/T 3102.7-1993, eqv ISO 31-7:1992) GB/T 3785-1983 Electrical and acoustic properties and test methods of sound level meters GB/T 3947 Acoustic terminology GB/T 15173-1994 Sound Calibrator GB/T 17181-1997 Integral average sound level meter (idt IEC 60804:1985) GB/T 23282-2009 Measurement method for noise sound power level of forging machinery

### 3 Terms and Definitions

GB/T 3947 and GB/T 3102.7 established and the following terms and definitions apply to this standard.

Airborne sound is radiated by the sound source under test (the machine under test).

**Note:** Noise emission characteristics can be listed on the product label or product manual. The basic noise emission characteristics are the sound power level of the sound source and the working position near the sound source.

emission sound pressure levels at the location and other specified locations.

On a reflective plane, the sound pressure at a specified location near a forging machine operating under specified installation and operating conditions. it does not include the back Scenic noise and the influence of other acoustic reflections outside the emitting surface allowed by this measurement method, the unit is Pa.

Variety.

The emission sound pressure level shall be measured at the specified location, which shall comply with the test procedures.

The maximum transient value of the emission sound pressure level measured in one operating cycle, in dB.

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The sound field in an isotropic homogeneous medium in the half-space above an infinite, hard surface where the machine under test is located.

The location designated for the operator near the machine under test.

Persons engaged in machine-related work tasks near the machine under test.

Machine-related locations, including but not limited to operator locations. The location can be a single fixed point, or several points on a path, or several points on the surface at a specified distance from the machine. If relevant test procedures are available, state them therein.

The time taken for the machine under test to complete a specified process.

3.10

The time required for the machine under test to complete a working cycle, in which each operating period occurs in a prescribed sequence, and each operating period is associated with a specific process is linked, and the specific process may occur only once in a running cycle, or it may be repeated many times.

#### 3.11

A continuous recording of the emission sound pressure level as a function of time is obtained during one or more operating periods of an operating period or operating cycle.

#### 3.12

Noise from all sound sources other than the sound source under test.

#### 3.13

The measured sound pressure level when the machine under test is not working, in dB.

#### 3.14

This correction value is used to represent the influence of background noise on the emission sound pressure level of the machine under test at the designated position. K1 is related to the frequency, and the unit is dB. A the correction term K1A in the weighted case is obtained from the A-weighted measurements.

#### 3.15

This correction value is used to express the influence of sound reflection or sound absorption on the surface sound pressure level, K2 is related to the frequency, and the unit is dB. Weighting in A in this case, it is represented by K2A.

#### 3.16

This correction value is used to represent the influence of reflected sound on the emission sound pressure level of the machine under test at the designated position (eg working position), in dB. K3 and frequency and location. In the case of A-weighting, it is represented by K3A.

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#### 3.17

The distance from the specified location to the closest major sound source to the machine. If the main sound source of the machine cannot be determined, select from the specified location to the machine the distance of the nearest part is taken as h.

## 4 Measuring instruments

When measuring, use a type 1 sound level meter (indication accuracy  $\pm 0.7\text{dB}$ ) and an integral sound level meter in accordance with the provisions of GB 3785-1983.

The average sound level meter shall meet the requirements of type 1 or above integral average sound level meter specified in GB/T 17181.

Before and after each measurement, an acoustic calibrator with an accuracy better than  $\pm 0.3\text{dB}$  (Class 1 accuracy specified in GB/T 15173-1994) should be used to measure the entire the measurement system is calibrated.

The sound calibrator shall be inspected once a year in accordance with the requirements of GB/T 15173-1994. Every two years should be in accordance with the requirements of GB/T 3785-1983, Calibrate the instrument system at least once.

The date of the last calibration to national standards should be recorded.

## 5.1 Overview

This standard applies to the environment in accordance with 5.2 and the background noise is corrected according to 5.3.

## 5.2 Applicable criteria for test environment

The environmental correction value  $K_{2A}$  of the test environment (as defined in GB/T 23282-2009 Measurement Method for Noise Sound Power Level of Forging Machinery) is used to characterize the degree to which the test environment deviates from the ideal, free field condition, the environmental correction value  $K_{2A}$  should not exceed 7dB.

## 5.3 Background noise correction criteria

At the microphone position, the background noise measured as the weighted sound pressure level (including wind noise at the microphone) should be at least lower than the measured mechanical sound level 3dB (preferably lower than 10dB), the background noise correction value is calculated according to formula (1).

$K_1 = -10 \lg(1 - 10^{-0.1 \Delta L})$  L (1) where.

$\Delta L$ ---The difference in sound pressure level measured at the specified position when the forging machine under test is opened and closed, the unit is decibel (dB).

**Note:** If  $\Delta L > 10\text{dB}$ ,  $K_{1A} = 0$  is specified; if  $\Delta L \leq 3\text{dB}$ , the measurement is invalid;  $K_{1A}$  for each microphone position should be determined.

### 5.4.1 Indoor test environment

#### 5.4.1.1

The ratio of the equivalent sound absorption area  $A$  of the test house to the measurement surface area  $S$  should be greater than or equal to 1, that is,  $A/S \geq 1$  (when  $A/S = 1$  Environmental correction value  $K_{2A} = 7\text{dB}$ ).