



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

**GB/T 50087-2013**

---

**Code for design of noise control of industrial enterprises  
(English Translation)**

**Issued on: November 29, 2013**

**Implemented on: June 1, 2014**

---

**Issued by: Ministry of Housing and Urban-Rural Development;**

## Table of Contents

|                                                                       |    |
|-----------------------------------------------------------------------|----|
| Foreword .....                                                        | 4  |
| 1 General provisions .....                                            | 7  |
| 2 Terms .....                                                         | 7  |
| 3 Design limits of noise control of industrial enterprises .....      | 9  |
| 4 Industrial enterprises in the overall design of noise control ..... | 10 |
| 5 Sound insulation design .....                                       | 13 |
| 6 Muffler Design .....                                                | 20 |
| 7 Sound Absorption Design .....                                       | 26 |
| 8 Vibration Isolation Design .....                                    | 29 |
| Explanation of wording in this Code .....                             | 30 |
| Normative References .....                                            | 31 |
| EXPLANATION OF PROVISIONS .....                                       | 32 |

### Foreword

This Code was revised by Beijing Municipal Institute of Labor Protection jointly with organizations concerned on basis of the previous national standard "Specifications for the design of noise control system in industrial enterprises" (GBJ 87-85) according to the requirements of Building Code [2009] No. 88 issued by the Ministry of Housing and Urban-Rural Development - "Notice on printing the development and revision plan of national engineering construction standards from in 2009".

During the process of revising this Code, the drafting group carried out extensive investigations, carefully summarized the practical experience, made reference to relevant international standards and advanced standards of other countries, widely solicited for opinions, made improvement, reviewed and finalized this Code.

This Code comprises eight clauses. Its main technical contents are. General provisions, Terms, Design limits of noise control of industrial enterprises, Industrial enterprises in the overall design of noise control, Sound insulation design, Muffler design, Sound absorption design, and Vibration isolation design.

The main technical contents revised in this Code are. 1.added the content on limit for impulsive noise; 2.made an appropriate modification on the noise limits for various workplaces; 3.modified the relevant clauses on the noise and vibration control measures.

This Code shall be under management of the Ministry of Housing and Urban-Rural

Development. The routine management and the interpretation of specific technical contents shall be performed by Beijing Municipal Institute of Labor Protection. During the process of implementing this Code, the relevant opinions and advices, whenever necessary, can be sent to Beijing Municipal Institute of Labor Protection (Address. No. 55, Taoranting Road, Xicheng District, Beijing, 100054, China).

Main drafting organization of this Code. Beijing Municipal Institute of Labor Protection

## **1 General provisions**

### **1.0.1**

This Code is formulated with view to preventing the noise hazard of industrial enterprises, guaranteeing the employees' health, ensuring the safety production and normal work, and protecting environment.

### **1.0.2**

This Code is applicable to the noise control design of the construction, renovation, extension and technical transformation engineering of industrial enterprises.

### **1.0.3**

The noise control design of the construction, renovation and extension engineering of industrial enterprises shall be carried out in parallel with the engineering design.

### **1.0.4**

The design of noise control of industrial enterprise shall cover comprehensive analysis on the production process, operating maintenance, noise reduction effect, and technical and economic efficiency.

### **1.0.5**

As for the noise generated during production process and by equipment, control shall be carried out at the sound source at first by replacing the high noise process and equipment with the low noise process and equipment; if it still fails to meet the requirement, the noise control measures such as sound insulation, noise elimination, sound absorption, vibration isolation and integrated control shall be taken.

### **1.0.6**

As for such workshops and workplaces that still fail to meet the design limit of noise control after being taken with corresponding noise control measures, proper personal protective measures shall be taken.

### **1.0.7**

In addition to the requirements stipulated in this Code, the design of noise control of industrial enterprises also shall comply with those in the current relevant standards of the

nation.

### **2.0.1 Workplace**

All working places controlled directly or indirectly by the employing unit and serving for occupational activities of laborers.

### **2.0.2 Impulsive noise**

The sound field where the energy density is uniform and is randomly distributed in all transmission directions.

### **2.0.13 Sound bridge**

The rigid connection between two layers in the double-layer or multi-layer sound insulation structure, by which the sound energy is transmitted in these two layers in the manner of vibration.

### **2.0.14 Sound lock**

A structure with a large number of chambers or corridors being capable of absorbing sound energy, which is used to connect both sides indoors but also achieve very low sound coupling, so as to improve the sound insulation capacity of two compartments.

### **2.0.15 Muffler**

The airflow line with acoustic lining or in special shape, which can effectively reduce the noise in air flow.

### **2.0.16 Sound absorption**

The process that the sound energy is reduced or converted to other types of energy when the sound wave passes through a certain medium or shots onto a certain dielectric surface.

### **2.0.17 Vibration isolation**

The measure using elastic support to reduce the capability of the system to respond to extrinsic motivation. At stable state, vibration isolation is represented by the reciprocal of transmissibility.

### **2.0.18 Insertion loss**

The sound pressure level difference at a certain measurement point before and after inserting the noise control equipment.

### 3 Design limits of noise control of industrial

enterprises

#### 3.0.1

The noise limits of various workplaces of industrial enterprises shall be in accordance with those specified in Table 3.0.1.

Table 3.0.1 -- Noise Limits of Various Workplaces

Workplaces Noise limits planning and industrial layout of the located area, and the site should not be selected at the centralized area of noise-sensitive buildings.

4.2.2 The site of industrial enterprise generating high noise shall be located at the windward side of the wind direction with local perennial minimum frequency in summer of the urban residents centralized area; the site of noise-sensitive industrial enterprise shall be located at the downwind side of the wind direction with local perennial minimum frequency in summer of the surrounding major noise source.

4.2.3 For the noise-sensitive enterprise, its site should not be selected at the high noise environment area and shall be far away from traffic artery, airport and main air route.

4.2.4 For the site selection of industrial enterprises, the natural buffer region shall be utilized.

### 4.3 General layout design

#### 4.3.1

Under the premise of meeting the process flow requirements, the general layout of industrial enterprises shall meet the following requirements.

1 In combination with the function partition and process partition, the living quarters and administrative office area shall be separated from the production area, and the high noise plant and low noise plant shall be arranged separately. The major noise sources in industrial enterprises should be concentrated relatively and should be far away from the on-site or off-site areas required to be quiet.

2 Tall buildings and structures insensitive to noise and in a direction conducive to sound insulation should be arrange...