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

GB/T 25749.1-2010

**Safety of machinery -- Evaluation of the emission of airborne
hazardous substances -- Part 1: Selection of test methods**

机械安全 空气传播的有害物质排放的评估 第1部分：试验方法的选择

(English Translation)

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1 Scope

This part of GB/T 25749 specifies the parameters used to evaluate the performance of machinery pollutant discharge or machinery pollutant control system. Headquarters Guidelines for selecting appropriate test methods for different application areas and machine types are given, including measures to reduce exposure to contaminants.

Effect. Test methods are given in other parts of GB/T 25749 (see Table 1).

2 Normative references

The following documents are essential for the application of this document. For dated references, only the dated version applies to this article pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 15706.1-2007 Basic Concepts and Design Principles of Machinery Safety Part 1: Basic Terms and Methods (ISO 12100-1. 2003, IDT)

3 Terms and Definitions

The terms and definitions defined in GB/T 15706.1-2007 and the following apply to this document.

3.1 Uncontrolled emission rate of a given pollutant

μ The mass of pollutants emitted by the machine into the surrounding space per unit time.

Note: It is not appropriate to take any measures to reduce air pollution around the machine (for example. capture devices, sealing equipment, humidification).

3.2 Controlled emission rate of a given pollutant

mk The mass of pollutants emitted by the machine into the surrounding space per unit time when measures to reduce air pollution are taken.

Note: Measures should be taken to reduce air pollution around the machine (for example. capture devices, sealing equipment, humidification).

3.3 Capture efficiency

The difference between the mass flow rate of a given pollutant collected directly by the pollutant control system and the uncontrolled mass flow rate of that pollutant emitted by the machine ratio.

Note 1: The capture efficiency can be calculated by the following formula. $\frac{\mu - m_k}{\mu} \times 100\%$ (1)

This formula applies only if $\mu - m_k$ represents the mass flow of pollutants captured directly. When emissions are affected by the control system, this parameter does not Be applicable.

Chapter 3), different test methods may be considered. The test method should be selected according to the following criteria.

- the type of pollutant used;
- Type of test environment.

ISO 3966, GB/T 2624.1, ISO 5168 are suitable for measuring fluid flow.

4.2 Types of pollutants used

Tests should be performed using actual contaminants whenever possible. However, in some cases, it is more convenient to use the tracer technique for testing. to actual pollution The addition of dyes to tracers needs to meet several conditions, especially the comparability of emission and flow patterns of actual pollutants and tracers.

Depending on the test method, two types of contaminants should be considered.

- aerosol (solid or liquid) or gaseous actual pollutants;
- Tracers that simulate actual pollutants.

When determining the actual pollutant emission rate without measuring air flow, both the actual pollutant and the tracer are used. Concentration measurements can be made by.

- Measured together with air flow in the duct;
- Measure at a position around the machine under test.

4.3.1 Overview

There are two main types of environmental test conditions that can be considered, and in some cases different test methods may be required.

4.3.2.1 Test bench method

Carry out the test in a test chamber specially designed for these tests or measurements, the size of the test chamber should be limited and known.

To prevent other machines from affecting the contamination conditions around the machine being inspected and interfering with the air flow through the contamination control system, the test chamber is only Place a machine.

The air flow pattern around the machine should be maintained by the specified general ventilation conditions of the test chamber.

NOTE: In such methods, the overall ventilation conditions and machine operating conditions are determined and to a certain extent random. Therefore, in most cases, they are not represents the actual situation encountered.

4.3.2.2 Indoor method

Tests are carried out in a chamber located in a laboratory or on-site at an industrial plant and dedicated to these tests or measurements.

Only one machine should be running at a time. Compared with the on-site method, this method can control the general ventilation and local ventilation more accurately. because the machine The position of the machine is not fixed, so in order to determine the effect of cross-air flow, the airflow pattern around the machine should be checked.

NOTE: In such methods, the overall ventilation conditions and machine operating conditions are determined and to a certain extent random. Therefore, in most cases, they are not represents the actual situation encountered.

4.3.3 On-site method

Many machines are too large to handle or have special installation or workmanship requirements and cannot be used in a test chamber (see 4.3.2.1) or indoors (See 4.3.2.2) to carry out the test, the test can be carried out at the installation site of the machine.

Due to the need to take into account various disturbances (such as cross-air flow) that occur in practical situations, the field is carried out in the usual working environment of the machine. Experimentation is especially important.

Before and during the test, care should be taken to determine the operating conditions of the machine to be tested and its pollutant control system, as well as the contamination

effects of the test.

The operating conditions of other machinery based on the test results.

NOTE: This effect can be avoided by using a suitable tracing method.

The operating conditions of inspected machines and other equipment should be recorded.

Additional measurements are required to assess the characteristics of general ventilation including air cross-flow. For example, crossovers caused by door openings Airflow can severely interfere with airflow patterns around the machine.

4.4 Method summary

A detailed description of each method is given in the various parts of GB/T 25749 listed in Table 1. Additional information on more specific test conditions will be Available in a Class C standard for a specific class of machinery.

5.1 Overview

In situations where several methods appear to be suitable, the following factors should be considered in selection.

- Determination of evaluation parameters that are comparable between machines and between pollutant control systems;
- Relevance of foreseeable machine working locations to the chosen method.

5.2 Choices related to evaluation parameters

The selection of the most appropriate parameters depends on the information needed, and one or more evaluation parameters are determined to satisfy this need.

a) For a specific machine and its pollutant control system, this requirement may be a comprehensive assessment of the emission of a given pollutant. Can be given by the following parameters.

- Given the controlled emission rate of pollutants (mk), or represented by the following parameters.
- Pollutant concentration parameter (PC).

b) For capture devices, separation equipment or more conventional pollutant control systems, a single parameter is sufficient to evaluate the following performance.

- For capture devices, capture efficiency (η_C);
- For separation equipment, it is the mass separation efficiency (η_S);
- For a given machine's pollutant control system and no air recirculation, the purification