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**Industrial fans - Specifications for balance quality and vibration
levels**

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foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules of Standardization Documents"

drafted.

This document is identical to ISO 14694.2003 "Specification for Balance Quality and Vibration Level of Industrial Fans".

The following minimal editorial changes have been made to this document.

---Chapter 2 List. Delete the ISO 7919-1 that is not quoted in the text, and change ISO 4863.1984 to ISO 4863.1984 according to the citation form in the text

ISO 4863, ISO 5348.1998 changed to ISO 5348, ISO 5801.1997 changed to ISO 5801, ISO 13348.2007 changed

for ISO 13348;

--- Incorporated the amendments to ISO 14694.2003/Amd.1.2010, and the outer margins of the clauses involved use vertical

Double lines (||) are marked.

Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents.

Introduction

This document is one of a series of standards covering important aspects affecting the design, manufacture and use of ventilators. This series of documents includes

ISO 5801, ISO 5802, ISO 12499, ISO 13347, ISO 13348, ISO 13349, ISO 13350, ISO 13351, ISO 14695

and CEN/BTS2/AH17.

This document addresses the needs of users and manufacturers of ventilator equipment, and provides technically accurate but complex full profile.

In the description of fan performance, vibration is recognized as an important parameter, which expresses the degree to which the fan is designed and constructed.

It can provide early warning of possible operating failures, which may be related to insufficient supporting structures, deterioration of equipment conditions, etc.

Although there are other standards on general mechanical vibration issues (eg ISO 10816), in the face of problems such as small installed capacity

When it is used for a specific type of machinery such as a 300kW fan, there are currently limitations due to its generalized characteristics.

Vibration measurements are important for the following reasons.

- a) design/development evaluation;
- b) Field testing;
- c) For condition monitoring or machinery health planning (Appendix C in ISO 14695.2003 gives recommended measuring points for machinery health) information;
- d) Inform the designers of supporting structures, foundations, piping systems, etc., the amount of residual vibration transmitted by the fan to the structure;
- e) In the final inspection stage as a quality assessment indicator.

NOTE. All information that can be obtained from tests carried out in accordance with this document (see ISO 14695.2003, Chapter 10) is neither necessary nor necessary for use in quality assessment.

Not suitable.

This document considers that while the open inlet/open outlet test can be used as a quality guide, the vibration of the ventilator will depend on the specified pneumatic

The aerodynamic conditions determine the speed and position of the fan.

This document, in conjunction with the two standards ISO 10816-3 and ISO 14695, describes the method used and the location of the sensors.

This is especially important when providing information on the transmission of vibrations to connecting pipes or foundations. The included grades are generally recommended for commercially available

with a purchased ventilator.

It is worth noting that vibration testing can be very expensive, sometimes far exceeding the initial investment in a ventilator, only if the unit functions

When affected, discrete frequencies or frequency bands will be applied, and the number of measuring points should also be limited according to the application.

The readings are the most important and sufficient to reflect the usual quality level.

Specification for Balance Quality and Vibration Levels for Industrial Fans

1 Scope

This document provides specifications for vibration and balance limits for ventilators for all purposes, except those specifically designed for air circulation,

Such as ceiling fans and table fans, but limited to the installed capacity of less than 300kW of all types of fans or the maximum power that can be purchased in the market is

355kW motors (following the R20 series), for fans with a power exceeding this value, the applicable limits are given in ISO 10816-3; when installed

When the power of the fan used varies around 300kW and is an item under a single contract, the manufacturer and the purchaser shall

The consensus is usually based on the majority opinion of the participating units.

Vibration data may be required for different purposes, see Chapter 5 for details. If customer is willing to accept lower quality balance vibration level see appendix

Record H.

This document recognizes that vibration measurements can be recorded as velocity, acceleration or displacement in absolute units or decibels based on a reference value;

Dynamically measured values will be affected by the actual installation on the balancing machine (see Appendix B), however the preferred parameter is speed in mm

per second (mm/s), given the root mean square (rms) and peak-to-peak or peak values given different customs around the world; it is also advisable to remember that fans and their

Components can be viewed as spring-mass systems, an understanding of which helps to solve most vibration problems (see Appendix D).

At the same time, it has been taken into account that the ventilator is often not connected to the ductwork during the factory tests, so that compared with normal operation, the aerodynamic conditions

There are significant differences; in addition, temporary foundation supports can also be used, the quality and stiffness of which are also different from those used in the field. Accordingly, such tests

Specified to measure vibration in a "narrow band"; field tests specified a "broad band", which represents a measure of overall vibration severity.

This document covers ventilator equipment with rigid rotors, commonly found in. commercial heating, ventilation and air conditioning, industrial process, mining/tunneling

Wind and power generation fields, other fields are not specifically excluded; do not include severe force, shock or extreme temperature applications, for this document

The adoption of any part or all of its amendments shall be determined by consultation between the parties involved.

The foundation and actual installation of the ventilator equipment is not within the scope of this document. The foundation design and the installation of the ventilator are generally not

It is assumed by the manufacturer that the foundation used to install the ventilator can provide the required support and stability to meet the ventilation requirements delivered by the factory.

Machine vibration evaluation criteria.

Other factors, such as impeller cleanliness, aerodynamic conditions, background vibrations, operating speeds different from those intended, and fan maintenance, can affect vibration levels of the ventilator, but are not within the scope of this document.

This document is intended to cover only the balance and vibration of fans and does not consider the impact of vibration on people, equipment or processes.

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, dated citations

documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to this document.

GB/T 9239.1-2006 Mechanical vibration constant state (rigid) rotor balance quality requirements - Part 1.Specifications and balance tolerance

Inspection (ISO 1940-1.2003, IDT)

ISO 254 Belt drive pulley quality, finish and balance (Beltdrives-Puleys-Quality,finishandbal-