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

GB/T 41850.8-2022

**Mechanical vibration - Measurement and evaluation of machine
vibration - Part 8: Reciprocating compressor systems**

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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"

Drafting.

This document is part 8 of GB/T 41850 "Measuring and Evaluation of Mechanical Vibration Machine Vibration". GB/T 41850 has been released

the following parts.

--- Part 8. Reciprocating compressor systems.

This document is identical to ISO 20816-8:2018 "Mechanical vibration measurement and evaluation of machine vibration - Part 8. Reciprocating compressors system".

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

Introduction

Today's machines operate under high-speed, heavy-load, variable-load conditions, and the working conditions are getting worse and worse. For more efficient use of materials, machine

Design and use restrictions are even tighter. It is generally expected that the machine will work continuously and the period between repairs is 2 or 3 years, so

More restrictive requirements are specified for the vibration amplitude of the machine to ensure its continuous safe and reliable operation. GB/T 41850 "Mechanical vibration

"Measurement and Evaluation of Machine Vibration" is an important basic standard for the measurement and evaluation of machine vibration.

Methods of measuring and evaluating machine vibration on rotating parts. GB/T 41850 is intended to consist of the following parts.

--- Part 1.General. The purpose is to give a method for measuring and evaluating various types of machine vibration on non-rotating parts and rotating shafts.

general requirements.

---Part 2.Above 40MW, with sliding bearing and rated speed of 1500r/min, 1800r/min, 3000r/min

and 3600r/min, land-installed gas turbines, steam turbines and generators. The purpose is to give gas for large land installations

Specific evaluation of turbine, steam turbine and generator bearing housing and shaft vibration.

--- Part 4.Gas turbines above 3MW with sliding bearings. The purpose is to give gas turbines not covered in Part 2

Specific evaluation of machine housing vibration and shaft vibration.

--- Part 5.Hydroelectric and pumped storage power station units. The purpose is to give the bearing of the hydroelectric power generation and pumped storage power station units

Guidelines for the evaluation of seat and shaft vibration measurements.

--- Part 8.Reciprocating compressor systems. The purpose is to establish a characteristic for the measurement and classification of mechanical vibration of reciprocating compressor system.

special procedures and guidelines.

--- Part 9.Gearing. The purpose is to give specific provisions for the measurement and evaluation of vibrations in gear units.

This document establishes methods and guidelines for the measurement and classification of mechanical vibration of reciprocating compressors. In general, this document addresses the main

Vibration of structures (including foundations, pulsation dampers and piping systems), the vibration recommendations given are mainly used for vibration classification and to avoid installation

In the event of problems with ancillary equipment on these structures, this document gives recommended measurement and evaluation criteria.

Typical characteristics of reciprocating compressors are reciprocating mass, periodically varying torque, cylinder expansion and

dynamic dampers, pulsating forces on the piping system, all of these characteristics lead to considerable alternating loads on the main bearing and vibration of the compressor system

verb. move. Generally speaking, the vibration magnitude of reciprocating compressor system is higher than that of rotary compressor system, but they are mainly caused by the design characteristics of the compressor.

Therefore, reciprocating compressors operate more stably than rotary compressors during the service life of the system.

In a reciprocating compressor system, measured on the compressor main structure (including foundation, pulsation damper, and piping system) and according to this paper

The quantitative vibration of parts only gives a rough description of the vibration state of the internal components of the machine.

When the recommended values based on experience with similar compressor systems are exceeded, the damage mainly occurs in the parts connected to the machine (such as meters,

heat exchangers, filters, pumps, etc.), components that connect compressors to peripheral equipment (such as pipes) or monitoring instruments installed on machines (such as pressure

force meter, thermometer). The assessment of damage by vibration depends primarily on the design and installation of these components. In some cases, the compressor's

Certain components may require specific measurements to ensure that vibration does not cause damage to the machine. Due to the many types of components assembled by the machine,

Even if the measured values are within the recommended values of this document, problems may still occur.

The above-mentioned local vibration problems can be corrected by specific "local measures" such as eliminating resonance. Nonetheless, experience shows that in large

In most cases it is feasible to specify a measurable variable to describe the vibration state and to give its recommended value. This shows that according to measurable variables and

Recommended value, which can give a reliable evaluation in most cases.

Abnormalities of internal compressor components caused by vibration are unlikely to occur if the magnitude of vibration measured in accordance with this document does not exceed the recommended value

wear.

The vibration value of the reciprocating compressor system is not only affected by the

characteristics of the machine itself, but also by the foundation to a large extent.

Reciprocating

The compressor can be regarded as a vibration source, and the vibration isolation between the compressor and the foundation is necessary. The vibration response of the foundation and the vibration of adjacent equipment, will affect the compressor

The system has a considerable impact.

Mechanical Vibration Measurement and Evaluation of Machine Vibration

Part 8. Reciprocating compressor systems

1 Scope

This document establishes procedures and guidelines for the measurement and classification of mechanical vibration in reciprocating compressor systems. The defined vibration value is mainly used for

Vibration staging of compressor systems and avoidance of reciprocating compressor system components (foundation, compressor, dampers, piping and

Fatigue problems of accessory equipment of the system). Shaft vibration is not considered.

This document applies to rigidly mounted reciprocating compressor systems with a rated speed of 120r/min~1800r/min. proposed overall

The evaluation criteria are related to the measurement method used. This document is also used to evaluate whether the vibration of the machine has any effect on the equipment directly mounted on the machine.

Adverse effects such as pulsation dampers and piping systems.

Note. The criteria presented in this document can also be used for reciprocating compressors other than the specified speed, but in this case different evaluation criteria may be used.

For machines driving reciprocating compressors, compliance with ISO 10816, other parts of ISO 20816 or other relevant standards will be

and grading to evaluate. This document does not include drivers.

The application of this document is limited when considering the effects of internal parts of the machine, such as valves, pistons, piston rings, etc.

may be detected from measurements. The identification of such problems may require research into diagnostic techniques, which are beyond the scope of this document.

Reciprocating compressor systems to which this document applies include.