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

GB/T 6075.6-2024

Replacing GB/T 6075.6-2002

**Mechanical vibration - Evaluation of machine vibration by
measurements on non-rotating parts - Part 6: Reciprocating
machines with power ratings above 100 kW**

(English Translation)

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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 for standardization documents" Drafting.

This document is part 6 of GB/T 6075 Mechanical vibration - Measurement on non-rotating parts - Evaluation of machine vibration.

The following parts have been published.

- Part 1: General;
- Part 2: Power above 50MW, rated speed 1500r/min, 1800r/min, 3000r/min, 3600r/min
Ground mounted steam turbines and generators;
- Part 3: Rated power greater than 15 kW and rated speed between 120 r/min and 15000
r/min measured on site Industrial machines;
- Part 4: Gas turbine units with sliding bearings;
- Part 5: Hydroelectric power plants and pumping station units;

--- Part 6: Reciprocating machines with power greater than 100 kW;

--- Part 7: Rotodynamic pumps for industrial applications (including rotating shaft measurements).

This document replaces GB/T 6075.6-2002 "Measurement and evaluation of machine vibration on non-rotating parts of machines - Part 6: High power Compared with GB/T 6075.6-2002, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

--- Changed the scope of application of this document, changing "gas compressor" to "reciprocating pump" (see Chapter 1, Chapter 1 of the 2002 edition);

--- Changed the inapplicability scope of this document and added "reciprocating compressors" (see Chapter 1, Chapter 1 of the 2002 edition).

This document is equivalent to ISO 10816-6:1995 "Mechanical vibration - Measurement and evaluation of machine vibration on non-rotating parts - Part 6.

Reciprocating machines with a power greater than 100 kW.

The following minimal editorial changes were made to this document.

--- Incorporated the amendments to ISO 10816-6:1995/AMD1.2015, the outer margins of the clauses involved are indicated by vertical A straight double line (|) is used to indicate;

--- ISO 10816-8 cited in the notes to Chapter 1 is replaced by ISO 20816-8. Change ISO 10816-8 to ISO 20816-8.

Introduction

GB/T 6075 "Mechanical vibration - Measurement and evaluation of machine vibration on non-rotating parts" provides the measurement and evaluation of machine vibration on non-rotating parts.

The requirements and guidelines for vibration of the equipment are intended to consist of the following parts.

--- Part 1: General. The purpose is to provide general conditions for measuring and evaluating machine vibration on non-rotating or non-reciprocating parts of the whole machine.

Parts and methods.

--- Part 2: Power above 50MW, rated speed 1500r/min, 1800r/min, 3000r/min, 3600r/min the purpose is to provide the measured values on the bearing housing or support of large steam turbines and generators.

Specific provisions for vibration intensity evaluation.

--- Part 3: Rated power greater than 15 kW and rated speed between 120 r/min and 15000 r/min measured on site Industrial machines. The purpose is to give an estimate of the vibration severity measured in situ on bearings, bearing seats or supports of this type of industrial machines Guidelines.

--- Part 4: Gas turbine units with sliding bearings. The purpose is to give the measurement of the bearing housing or support seat of the gas turbine Specific provisions for vibration intensity evaluation.

--- Part 5: Hydroelectric power plants and pumping station units. The purpose is to give the vibration of hydroelectric power plants and pumping station units on non-rotating parts.

Criteria for measuring and evaluating movement.

--- Part 6: Reciprocating machines with a power greater than 100 kW. The purpose is to give the reciprocating machines with a power greater than 100 kW.

Methods and guidelines for vibration measurement and classification.

--- Part 7: Rotary dynamic pumps for industrial applications (including rotating shaft measurement). The purpose is to give the requirements of rotary dynamic pumps for industrial applications.

Specific requirements and guidelines for measuring and evaluating vibration on non-rotating parts (bearing seats) are also given for evaluating relative axis vibration of rotating shafts.

General information and guidelines.

This document establishes methods and guidelines for measuring and classifying mechanical vibrations of reciprocating machines. In general, this document focuses on the vibrations of the main structure of the machine.

The vibration indexes given are mainly used to classify the vibration of the machine to avoid problems with the auxiliary equipment attached to it.

Recommended measurement and evaluation criteria.

Typical characteristics of reciprocating machines are oscillating mass, periodically varying output (input) torque, and pulsating forces applied to the pipeline.

These characteristics cause considerable alternating forces in the main support and vibrations in the main frame, the magnitude of which is often higher than that of rotating machines.

Due to the design characteristics of the machine, reciprocating machines are more stable than rotary machines over their service life.

In reciprocating machines, vibrations measured on the main structure of the machine and quantified according to this document give only the stresses and the general concept of

vibration state. For example, the torsional vibration of rotating parts cannot generally be assessed by measuring the structural parts of the machine.

The damage caused by the standard values obtained from experience mainly occurs in the parts connected to the machine (such as turbochargers, heat exchangers, Controllers, filters, pumps, etc.), components that connect the machine to peripheral equipment (such as pipes) or monitoring instruments installed on the machine (such as pressure the damage assessment by vibration depends critically on the design and installation of these components.

In some cases, it is necessary to carry out specific measurements on certain parts of the machine to ensure that the vibrations are within the permissible range.

It can happen that even if the measured values are within the standard allowable values, problems may occur due to the fact that the components installed in various machines are very different.

These problems can and should be corrected by special "local measures" (e.g. by eliminating resonances). Nevertheless, experience has shown that most in some cases, it is possible to specify a measurable quantity that describes the vibration state and give a guide value. This means that the measurable variable and the guide value can be for quantitative purposes, the term "vibration" will be used when describing the vibration of reciprocating machinery in a simplified manner.

Intensity of movement".

The vibration of a reciprocating piston machine is not only affected by the characteristics of the machine itself, but also to a large extent by the foundation.

As a vibration source, vibration isolation between the machine and the foundation may be necessary, because the vibration response of the foundation will have a considerable impact on the vibration of the machine itself.

These vibration conditions also depend on the transmission characteristics of the machine's surrounding environment, so they cannot be completely determined by the vibration of the machine itself.

The document only serves as a guide with regard to the environmental impact of the machine.

Mechanical vibration measurement and evaluation on non-rotating parts Vibration of machinery Part 6: Power greater than 100kW reciprocating machine

1 Scope

This document uses the method of measuring the vibration of non-rotating and non-reciprocating parts of the whole machine to evaluate the mechanical vibration of