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**Rotodynamic pumps - Hydraulic performance acceptance test
using a model pump**

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Foreword

This document complies with the provisions of GB/T 1:1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents"

Drafting:

This document is modified using ISO /T R19688:2019 "Hydraulic Performance Acceptance Test of Rotary Power Pump Model Pump": The file type is adopted by ISO

The technical report was adjusted into my country's national standardization guidance document:

The technical differences between this document and ISO /T R19688:2019 and their reasons are as follows:

---Replaced ISO 17769-1 with normatively cited GB/T 33925:1, and GB/T 33925:2 replaced ISO 17769-2 (see

Chapter 3), in order to adapt to my country's technical conditions and increase operability;

---Change the surface roughness symbol e in ISO /T R19688:2019 to R_a (see Table 1) to prevent confusion between surface roughness and different

Symbol of certainty;

---Change the tolerance in ISO /T R19688:2019 to a tolerance coefficient (see Table 1, 9:3:3) to eliminate ambiguity;

---According to the definition of JJF1015:18, uncertainty should be a non-negative parameter, and the negative sign of uncertainty in ISO /T R19688:2019 has been deleted:

[See 7:7:2d) and e)]:

The following editorial changes have been made to this document:

---Replaced ISO 9906:2012 with the informative reference GB/T 3216-2016 (see 3:1:2, 3:1:3, 7:1, Table 4, 7:4:1,

7:4:6, 8:4, 9:1:2, B:2:2:2:2), GB/T 2624:1 replaced ISO 5167-1 (see 7:5:2), GB/T 17612 replaced

ISO 4185 (see 7:5:4) and GB/T 27418 replaced ISO /IEC Guide98-3 (see B:1) to adapt to my country's technical conditions

components to increase operability;

---Corrected the error in the standard deviation calculation formula (B:8) in ISO /T R19688:2019 (see B:2:2:2), relative uncertainty meter

Errors in calculation formulas (B:4) ~ formulas (B:6), formulas (B:10) ~ formulas (B:12), in order to correctly guide the use of this document:

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

Introduction

If the capabilities of the manufacturer's test facilities do not meet the material conditions necessary to test the pump under actual flow/head conditions, a model may be selected:

type pump instead: With the help of similarity theory, the model pump data is used to scale and evaluate the performance of the real pump to be manufactured: Choose to use the model

The principles for testing type pumps (or real type pumps) are as follows:

---Pump performance such as flow rate and/or pump input power (such as flow rate $\geq 35000\text{m}^3/\text{h}$, pump input power $\geq 5000\text{kW}$) exceeds the test

the limits of testing facilities;

---A certain part or parts of the pump are concrete structures, and it is impractical to replicate them as a whole:

Taking into account the given practical conditions, the application of model pumps in hydraulic performance acceptance tests is a practical and efficient alternative: Use model

Advantages of type pumps may also include:

---Higher precision due to differences in measurement uncertainty;

---The lowest cost considering materials and other resources;

---Shorten the delivery time of real-type pumps:

Over the years, manufacturers have developed and presented independent approximate calculation methods and accumulated experience in applying similar pump theory and its details:

Relevant literature also introduces several computational models: This document describes the hydraulic performance acceptance test methods of model pumps, and GB/T 3216-

Other test methods specified in:2016 (Hydraulic Performance Acceptance Test for Real Pumps):

This document was originally written based on previous standards (such as JISB8327), and the final version is given in conjunction with GB/T 3216-2016

The latest pump hydraulic performance acceptance test method is formulated:

Hydraulic performance acceptance test of rotary power pump model pump

1 Scope

This document specifies the use of a small size pump (centrifugal pump, mixed flow pump and axial flow pump, hereafter referred to as the model pump) for hydraulic performance acceptance testing

Testing methods (including cavitation test)

This document is applicable to pump acceptance tests using geometrically similar model pumps to ensure that large-size pumps (below

Called real type pump) performance: However, this document does not prevent temporary overall inspection or other testing of full-type pumps: At the same time, I also think that it is best to carry out real type

Pump test unless subject to the following conditions:

---Pump capacity (pump flow and/or pump input power) exceeds the limits of the test facility, although it is difficult to establish based on flow or power

Criteria for substituting model pump tests for full-scale pump tests;

---A certain part of the pump is a concrete structure, and it is impractical to replicate it as a whole;

---Model testing specified by the buyer;

---For other reasons, it is difficult to conduct real-type pump tests:

This document is applicable to performance tests under stable operating conditions corresponding to real-type pumps:

2 Normative reference documents

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

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

this document:

GB/T 33925:1 General terms, definitions, quantities, characters and units for liquid pumps and their devices Part 1: Liquid pumps

(GB/T 33925:1-2017,ISO 17769-1:2012,IDT)

GB/T 33925:2 General terms, definitions, quantities, characters and units for liquid pumps and their devices Part 2: Pump systems

(GB/T 33925:2-2018,ISO 17769-2:2012,IDT)

3 Terms and definitions

The terms and definitions defined in GB/T 33925:1, GB/T 33925:2 and the following apply to this document:

3:1 General terms

3:1:1

performance test performancetest

A test to measure pump performance without the influence of cavitation:

3:1:2

cavitation test cavitation test

A test of a model pump under the corresponding working conditions of a real pump to