Centrifugal, mixed flow and axial pumps - Code for hydraulic performance tests - Precision class

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EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN ISO 5198:2003 sisaldab Euroopa standardi EN ISO 5198:1998 ingliskeelset teksti. Käesolev dokument on jõustatud 14.08.2003 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN ISO 5198:2003 consists of the English text of the European standard EN ISO 5198:1998. This document is endorsed on 14.08.2003 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This International Standard specifies precision class hydraulic performance tests for centrifugal, mixed flow and axial pumps	**Scope:** This International Standard specifies precision class hydraulic performance tests for centrifugal, mixed flow and axial pumps

ICS 23.080

Võtmesõnad: centrifugal pumps, performance tests., pumps, tests

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EN ISO 5198

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ICS 23.080

English version

Centrifugal, mixed flow and axial pumps

Code for hydraulic performance tests – Precision class
(ISO 5198 : 1987)

Pompes centrifuges, hélico-centrifuges et hélices – Code d'essais de fonctionnement hydraulique – Classe de precision (ISO 5198 : 1987)

Kreiselpumpen (Radial-, Halbaxial- und Axialkreiselpumpen) – Regeln für die Messung des hydraulischen Betriebsverhaltens – Präzisionsklasse (ISO 5198 : 1987)

This European Standard was approved by CEN on 1998-11-08.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Ref. No. EN ISO 5198 : 1998 E

Foreword

International Standard

ISO 5198 : 1987 Centrifugal, mixed flow and axial pumps – Code for hydraulic performance tests – Precision class,

which was prepared by ISO/TC 115 'Pumps' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 197 'Pumps', the Secretariat of which is held by AFNOR, as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by May 1999 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 5198 : 1987 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

Contents

0 Introduction

This International Standard is the first of a set of International Standards dealing with performance tests of centrifugal, mixed flow and axial pumps (in the rest of the text referred to as "pumps").

It specifies precision class tests (former class A). Engineering class I and class II tests (former classes B and C) will be the subject of a further International Standard.[1)]

The aims of these classes are quite different.

The precision class is mainly used for research, development and scientific purposes in laboratories, where an extremely high accuracy of measurement is important.

The engineering classes are generally applied for acceptance tests.

In most cases, engineering class II is adequate for acceptance tests. The use of engineering class I is restricted to special cases when there is a need to have the pump performance more precisely defined. However, there may be cases of high importance, in which even an engineering class I acceptance test will be judged inadequate for the precision required for defining pump performance. In these cases the use of the precision class may exceptionally be necessary for an acceptance test.

Attention must be paid to the fact that the accuracy required for a precision class test significantly increases the test costs by comparison with the costs for an engineering class test.

Precision class tests may not always be practicable, even when great effort and expense are devoted to measurements. Performance tests to precision class specifications will be required, and are possible, only in suitable circumstances. Therefore both the purchaser and the manufacturer shall carefully examine whether the accuracy required for a precision class test might be achieved either on site, on the manufacturer's test bed or in a mutually agreed laboratory. It should be noted that it may not be possible to guarantee precision class accuracy in advance of the tests.

The purpose of this International Standard is to specify how to carry out a test with extremely high precision.

This International Standard does not recommend any constructional tolerance nor any global tolerance for acceptance purposes; it is devoted to specifying and describing procedure and methods for accurately ascertaining the performance of a pump under the conditions in which it is tested. Contractual interpretation of the test results must be the subject of a special agreement between the parties concerned (see annex B).

Pump performance may be greatly affected by the installation conditions, and this must be especially considered when drawing up the contract if a precision class test is to be carried out.

1 Scope

This International Standard specifies precision class performance tests for centrifugal, mixed flow and axial pumps.

It defines the terms and quantities that are used and specifies general requirements for tests. It specifies ways of measuring the characteristic quantities of the precision class so as to ascertain the performance of the pump and thus provide a basis for comparison with the performance specified in the contract.

The structural details of pumps and the mechanical properties of their components lie outside the scope of this International Standard.

This International Standard does not specify constructional tolerances, which are purely contractual.

2 Field of application

This International Standard gives recommendations for hydraulic performance testing of centrifugal, mixed-flow and axial pumps when these tests have to meet very special requirements for research, development or acceptance of industrial high-tech pumps, or when very accurate knowledge of performance characteristics is of prime importance.

This International Standard also applies to models and prototypes whether the pumps are tested on a test bench or on site if installation conditions so permit.

1) At present, they are dealt with in ISO 2548 and ISO 3555.

It applies

— either to the pump itself without fittings, which requires that the pump ends are accessible; or

— to the whole assembly of pump and of all or part of its upstream and downstream fittings, which is the case for pumps with inaccessible ends (submerged pumps, etc.).

NOTES

1 Attention is drawn to the fact that nearly all industrial needs are covered by the codes of acceptance testing of industrial classes I and II.

2 Acceptance tests for site and model storage pumps are dealt with in IEC Publications 198 and 497.

3 References

ISO 31, *Quantities, units and symbols.*

ISO 555, *Liquid flow measurement in open channels — Dilution methods for measurement of steady flow —*

Part 1: Constant-rate injection method.

Part 2: Integration (sudden injection) method.

Part 3: Constant-rate injection method and integration method using radioactive tracers.

ISO 1438, *Liquid flow measurement in open channels using thin-plate weirs and venturi flumes.*

ISO 1438/1, *Water flow measurement in open channels using weirs and venturi flumes — Part 1: Thin-plate weirs.*

ISO 2186, *Fluid flow in closed conduits — Connections for pressure signal transmissions between primary and secondary elements.*

ISO 2548, *Centrifugal, mixed flow and axial pumps — Code for acceptance tests — Class C.*

ISO 2975, *Measurement of water flow in closed conduits — Tracer methods —*

Part 1: General.

Part 2: Constant rate injection method using non-radioactive tracers.

Part 3: Constant rate injection method using radioactive tracers.

Part 6: Transit time method using non-radioactive tracers.

Part 7: Transit time method using radioactive tracers.

ISO 3354, *Measurement of clean water flow in closed conduits — Velocity-area method using current-meters.*

ISO 3534, *Statistics — Vocabulary and symbols.*

ISO 3555, *Centrifugal, mixed flow and axial pumps — Code for acceptance tests — Class B.*

ISO 3846, *Liquid flow measurement in open channels by weirs and flumes — Free overfall weirs of finite crest width (rectangular broad-crested weirs).*

ISO 3966, *Measurement of fluid flow in closed conduits — Velocity area method using Pitot static tubes.*

ISO 4185, *Measurement of liquid flow in closed conduits — Weighing method.*

ISO 4359, *Liquid flow measurement in open channels — Rectangular, trapezoidal and U-shaped flumes.*

ISO 4360, *Liquid flow measurement in open channels by weirs and flumes — Triangular profile weirs.*

ISO 4373, *Measurement of liquid flow in open channels — Water level measuring devices.*

ISO 5167, *Measurement of fluid flow by means of orifice plates, nozzles and venturi tubes inserted in circular cross-section conduits running full.*

ISO 5168, *Measurement of fluid flow — Estimation of uncertainty of a flow-rate measurement.*

ISO 7194, *Measurement of fluid flow in closed conduits — Velocity-area methods of flow measurement in swirling or asymmetric flow conditions in circular ducts by means of current-meters or Pitot static tubes.*

ISO 8316, *Measurement of liquid flow in closed conduits — Method by collection of the liquid in a volumetric tank.*[1)]

IEC Publication 34-2, *Rotating electrical machines — Part 2: Methods for determining losses and efficiency of rotating electrical machinery from tests (excluding machines for traction vehicles).*

IEC Publication 41, *International code for the field acceptance tests of hydraulic turbines.*

IEC Publication 193, *International code for model acceptance tests of hydraulic turbines.*

IEC Publication 198, *International code for the field acceptance tests of storage pumps.*

IEC Publication 497, *International code for model acceptance tests of storage pumps.*

1) At present at the stage of draft.