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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

DRAFT INTERNATIONAL STANDARD

ISO/DIS 4679

ISO/TC 8/SC 8

Secretariat: **KATS**

Voting begins on:
2022-04-13

Voting terminates on:
2022-07-06

Ships and marine technology — Hydraulic performance tests for waterjet propulsion system

ICS: 47.020.20

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This document is circulated as received from the committee secretariat.



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 8, *Ship design*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The purpose of this document is to establish a standard for hydraulic performance test of water jet propulsion. The test methods for the waterjet propulsion pump with and without the inlet duct are both specified. This document is applicable to the hydraulic performance test of water jet propulsion under the specified test conditions. This document specifies the precision grade of Class A for hydraulic model tests of water jet propulsion and Class B for acceptance tests of small and middle-sized or intermediate test model.

Class A is mainly used for research and development; Class B is mainly used for acceptance test. If the purchaser and the manufacturer have special needs, intermediate test with precision grade in between may also be carried out.

This document specifies the test conditions of Class A and Class B and the requirements for test equipment to ensure that the test can be carried out under the conditions of corresponding accuracy.

Ships and marine technology — Hydraulic performance tests for waterjet propulsion system

1 Scope

This document specifies two precision grades for hydraulic performance tests: Class A and Class B.

It defines the terms and quantities that are used for waterjets and specifies requirements for test conditions, installations, instruments, method and uncertainty analysis for hydraulic performance tests.

Class A stands for the precision level and is applicable for hydraulic model tests and prototype model tests which require higher accuracy. Class A is mainly used for laboratorial research and scientific purposes which require higher measurement accuracy. Class B stands for the engineering level and is applicable for acceptance tests of batch inspections of small and middle-sized prototype models.

This document does not include miscellaneous parts of waterjet unit, such as steering and reversing gear, hydraulic system and control system.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 9906:2012, *Rotodynamic pumps — Hydraulic performance acceptance tests — Grades 1, 2 and 3*

ISO/TR 17766, *Centrifugal pumps handling viscous liquids — Performance corrections*

ISO 17769-1, *Liquid pumps and installation — General terms, definitions, quantities, letter symbols and units — Part 1: Liquid pumps*

3 Terms and definitions

For the purposes of this document, the terms, definitions, quantities and symbols given in ISO 17769-1, ISO 17769-2^[2], ISO 5198^[4] and JJF 1001^[3] and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

waterjet unit

unit that consists of waterjet propulsion, steering and reversing gear, hydraulic system and control system which is able to steer and reverse the main body

3.2

waterjet propulsion

propulsion that consists of waterjet pump, nozzle and inlet duct (generally the impeller of waterjet pump is integrated with the nozzle) and that is able to drive the main body moving

3.3

waterjet pump

pump that transfers the energy of prime mover to water by rotating impeller

Note 1 to entry: Thus it obtains counter-acting force and drives the main body moving. It consists of impeller, guide vane, shell and shaft (hereinafter referred to as “pump”). The main types are mixed-flow type and axial flow type. Axial flow waterjet pump is one that the liquid is discharged axially from impeller. Mixed-flow waterjet pump is one that the liquid is discharged from impeller with an angle α ($0^\circ < \alpha < 90^\circ$) to the shaft line, also called inclined waterjet pump.

3.4

volume flow rate, Q

volume of liquid discharged by waterjet pump per unit time

3.5

inlet total head

H_1

overall energy at the inlet section of the pump

Note 1 to entry: Inlet total head is given by [Formula \(1\)](#):

$$H_1 = z_1 + \frac{p_1}{\rho g} + \frac{v_1^2}{2g} \quad (1)$$

where

z_1 is inlet height above reference plane, m;

p_1 is inlet pressure, Pa;

ρ is density of liquid, kg/m³;

g is acceleration of gravity, m/s²;

v_1 is inlet velocity, m/s.

[SOURCE: ISO 9906:2012, 3.2.13]

3.6

outlet total head

H_2

overall energy at the outlet section of the pump

Note 1 to entry: Outlet total head is given by [Formula \(2\)](#):

$$H_2 = z_2 + \frac{p_2}{\rho g} + \frac{v_2^2}{2g} \quad (2)$$

where

z_2 is outlet height above reference plane, m;

p_2 is outlet pressure, Pa;

v_2 is outlet velocity, m/s.

[SOURCE: ISO 9906:2012, 3.2.14]

3.7

pump total head

H

algebraic difference between the outlet total head H_2 and the inlet total head H_1

Note 1 to entry: Pump total head is given by [Formula \(3\)](#):