

ICS 03.220.40

CCS R06



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

GB/T 27874-2023

**Technical requirement and assessment method of energy
saving products and technologies for marine**

船舶节能产品使用技术条件及评定方法

Issued on: March 17, 2023

Implemented on: July 1, 2023

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

Foreword	3
1 Scope	5
2 Normative References	5
3 Terms and Definitions	6
4 Use Technical Conditions	6
5 Assessment Items and Methods	8
6 Test Methods and Verification Methods	9
7 Assessment Methods	11
Appendix A (Normative) Comparison Test Method of Engine Bench of Marine	17
Appendix B (Normative) Comparison Test of Actual Marine	20
Appendix C (Normative) Test Data Processing	23

Foreword

This document was issued on 17 March 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 July 2023.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

1 Scope

GB/T 27874-2023 covers the fuel-saving products and technologies sold for ships - the technical conditions such a product has to meet in use, the items to be assessed and the methods used, the test and verification methods, and the way results are turned into a verdict. A saving claimed in a brochure means nothing unless the same engine or the same vessel is measured with and without the product under conditions that have been held equal, so the comparison itself is fixed: an engine bench comparison test in one annex, a comparison test aboard a working ship in another, and the data processing in a third that says how two runs are corrected before they are set against each other. Fuel is only half the question. The assessment also weighs engine power, the vessel's speed, safety in navigation and effects on the environment, because a device that saves fuel by robbing power, by making the ship slower, or by worsening emissions has saved nothing at all. Written for shipowners and operators weighing a retrofit, for the suppliers of energy-saving equipment who have to substantiate a figure, and for the laboratories and surveyors asked to certify one.

This Document specifies the use technical conditions, assessment items and methods, test methods, verification methods, and evaluation methods for the marine energy-saving products.

This Document is applicable to the assessment of the use effect of energy-saving products aimed at reducing the energy consumption of various types of internal combustion engine-powered marines.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates

indicated are applicable to this Document; for the undated documents, only the latest version

(including all the amendments) is applicable to this Document.

GB/T 2820.6 Reciprocating internal combustion engine driven alternating current generating sets - Part 6: Test methods

GB/T 3221 Code for dock and sea trials of diesel-driven inland ships

GB/T 3471 General provisions for programming mooring and sea trials of sea going ships

GB/T 6072.3 Reciprocating internal combustion engines - Performance - Part 3: Test measurements

GB/T 14951-2007 Measurement method of fuel saving technology for automobiles

GB 15097 Measure method for emission pollutant of exhaust gas of marine diesel engine

GB/T 25348-2010 Technical specification of fuel saving products for automobiles

GB/T 30009 Calculation method for energy efficiency design index of ships

GB/T 30010 Method for the verification of energy efficiency design index of ships

CB/T 4147 Measurement methods of fuel consumption rate for marine diesel engines

CB/T 4148 Measurement of thermodynamics parameters for marine diesel engines

3 Terms and Definitions

3.1 Energy saving products and technologies for marine

Products, technologies and processes that have no adverse effects on the marine's rapidity, operating safety, engine power and other main performance and the environment while reducing

the energy consumption during the marine's operation.

3.2 Rate of fuel saving

After the use of energy-saving products and technologies for marine, the ratio of the magnitude

of the decrease in marine energy consumption to the energy consumption before using energy-

saving products and technologies for marine.

3.3 Rate of pollution reducing

After the use of energy-saving products and technologies for marine, the ratio of the magnitude

of the decrease in the emission of exhaust pollutants from marine to the emission of exhaust

pollutants before the use of energy-saving products and technologies for marine.

3.4 Unit fuel consumption

Fuel consumption per unit mileage of marine in operation.

3.5 Energy efficiency design index obtained from sea trial test

The actual energy efficiency index of the marine is calculated by bringing the data obtained from the actual marine test into the calculation formula of the marine energy efficiency design

index.

NOTE: The energy efficiency design index obtained from sea trial test reflects the energy efficiency level

of the marine in actual operation.

4 Use Technical Conditions

4.1 Energy saving index

4.1.1 When the comparison test is carried out on the engine bench, the rate of fuel saving shall

meet any of the following conditions:

a) The energy-saving rate of the engine propulsion characteristics is no less than 1.5%, and the energy-saving rate of the load characteristics is no less than 1.0%;

4.6.1 For marine energy-saving products applied to engines, when the engine bench test is used

for verification, the assessment conditions shall meet the requirements of 4.1.1, 4.2.1, 4.4.1 and

4.5 at the same time.

4.6.2 For marine energy-saving products applied to engines, when the propulsion characteristics

of the actual marine engine are used for verification, the assessment conditions shall meet the

requirements of 4.1.2a), 4.2.2, 4.4.1 and 4.5 at the same time.

4.6.3 For marine energy-saving products applied to engines, when the load characteristics of

the actual marine engine are used for verification, and the assessment conditions shall meet the

requirements of 4.1.2b), 4.4.1 and 4.5 at the same time.

4.6.4 The assessment conditions of marine energy-saving products applied to the hull structure

shall meet the requirements of 4.1.2c), 4.2.2, 4.3 and 4.4.2 at the same time.

5 Assessment Items and Methods

5.1 Assessment items

5.1.1 Energy saving

The energy-saving performance of marine energy-saving products is assessed by the rate of fuel

saving; and the assessment of rate of fuel saving can be obtained by selecting the following methods according to the use and characteristics of the energy-saving products:

a) When the actual marine verification method is adopted, it can be calculated based on the difference between the energy efficiency design index obtained from sea trial test