



BSI Standards Publication

## **Ships and marine technology — Performance test procedures of LNG BOG re-liquefaction system on board a ship**

---

## National foreword

This British Standard is the UK implementation of ISO 16259:2025.

The UK participation in its preparation was entrusted to Technical Committee SME/32, Ships and marine technology - Steering committee.

A list of organizations represented on this committee can be obtained on request to its committee manager.

### Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

© The British Standards Institution 2025  
Published by BSI Standards Limited 2025

ISBN 978 0 539 22576 1

ICS 47.020.99

**Compliance with a British Standard cannot confer immunity from legal obligations.**

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2025.

### Amendments/corrigenda issued since publication

| Date | Text affected |
|------|---------------|
|------|---------------|



**International  
Standard**

**ISO 16259**

**Ships and marine technology —  
Performance test procedures of  
LNG BOG re-liquefaction system on  
board a ship**

*Navires et technologie maritime — Modes opératoires d'essais  
de performance d'un système de re-liquéfaction BOG GNL à bord  
d'un navire*

**First edition  
2025-09**

Reference number  
ISO 16259:2025(en)

Full document details: BS ISO 16259:2025

© ISO 2025  **Documents**  
Document Sharing Hub



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

|                                                                                       |           |
|---------------------------------------------------------------------------------------|-----------|
| <b>Foreword</b>                                                                       | <b>iv</b> |
| <b>Introduction</b>                                                                   | <b>v</b>  |
| <b>1 Scope</b>                                                                        | <b>1</b>  |
| <b>2 Normative references</b>                                                         | <b>1</b>  |
| <b>3 Terms and definitions</b>                                                        | <b>1</b>  |
| <b>4 Abbreviated terms</b>                                                            | <b>2</b>  |
| <b>5 Inspection and tests</b>                                                         | <b>2</b>  |
| 5.1 General                                                                           | 2         |
| 5.2 Test fluid                                                                        | 3         |
| 5.3 Design appraisal                                                                  | 3         |
| 5.4 Equipment safety function testing                                                 | 3         |
| 5.5 Hydrostatic test                                                                  | 3         |
| 5.6 Instrument signal inspection                                                      | 4         |
| 5.7 Cryogenic function test                                                           | 4         |
| 5.8 Emergency shutdown test                                                           | 4         |
| 5.9 Performance test at cryogenic condition                                           | 5         |
| 5.10 Visual inspection                                                                | 5         |
| <b>6 Marking</b>                                                                      | <b>5</b>  |
| <b>7 Test reports</b>                                                                 | <b>6</b>  |
| <b>Annex A (informative) Inspection and test procedure</b>                            | <b>7</b>  |
| <b>Annex B (informative) Example of document lists applicable to design appraisal</b> | <b>11</b> |
| <b>Annex C (informative) Examples of test report forms</b>                            | <b>12</b> |
| <b>Annex D (informative) Example of concept model for LNG re-liquefaction system</b>  | <b>17</b> |
| <b>Annex E (informative) Components of natural gas</b>                                | <b>19</b> |
| <b>Bibliography</b>                                                                   | <b>20</b> |

## 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 document 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](http://www.iso.org/directives)).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 25, *Maritime GHG reduction*.

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](http://www.iso.org/members.html).

## Introduction

The shipbuilding and marine industries have shown growing interest in the use of liquified natural gas (LNG) to meet the increasingly strict international, regional and national regulations on gas emissions which are harmful to the environment. One of the most important pieces of equipment used in the LNG vessel system is the LNG boil-off gas (BOG) re-liquefaction system, since it can change natural gas to liquefied natural gas. This allows the LNG ship to decrease fuel consumption and contribute to marine environmental protection.

The LNG fuelled vessel or bunkering vessel is expected to be designed and manufactured according to the requirements of internationally recognized standards such as IMO IGF<sup>[1]</sup> and IGC Codes.<sup>[2]</sup> However, an internationally recognized standard on the performance testing of LNG BOG re-liquefaction systems on board a ship has not yet been established. As the LNG BOG re-liquefaction system is tested according to a case-by-case agreement between the owner and manufacturer, such an internationally recognized standard would enable a test method which is commonly accepted by all stakeholders (e.g. ship owners, classification societies, equipment manufactures and shipyards). For this reason, it is important to have an objective document to test the performance of the LNG BOG re-liquefaction system on board a ship, which is commonly acceptable to all stakeholders (e.g. ship owners, classification societies, equipment manufacturers and shipyards).

In this regard, this document is designed to set a test procedure to evaluate the performance of the LNG BOG re-liquefaction system on board a ship. This document aims to:

- a) enable the performance of LNG BOG re-liquefaction system to be identified from an objective point of view;
- b) provide useful requirements and guidelines to all stakeholders;
- c) facilitate the development of more reliable LNG BOG re-liquefaction systems, with a view to contributing to the growth of relevant industries and benefitting all stakeholders.

This document is intended to be applied in various situations, including factory acceptance tests or onboard tests. The LNG BOG re-liquefaction system provider and ship owner are expected to agree on any additional requirements that apply beyond the test requirements outlined in this document.

NOTE Relevant IACS requirements and legal requirements can apply.



# Ships and marine technology — Performance test procedures of LNG BOG re-liquefaction system on board a ship

## 1 Scope

This document specifies requirements and procedures for the performance test to verify the mechanical features of the liquified natural gas (LNG) boil-off gas (BOG) re-liquefaction system on board a ship. These test procedures can be prepared for LNG BOG re-liquefaction systems of LNG ships such as LNG carriers, LNG bunkering vessels and LNG fuelled vessels. Functions which are specific to manufacturers and any additional tests or specifications required by clients are not covered in this document.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology 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 design pressure

pressure at which each component of a piping system is designed to operate

Note 1 to entry: The design pressure must not be less than the pressure at the most severe condition of coincidental internal or external pressure and temperature (maximum or minimum) expected during service.

### 3.2 design temperature

maximum temperature at which each component is designed to operate

Note 1 to entry: The design temperature must not be less than the temperature of the component material at the most severe condition of temperature and coincidental pressure expected during service.

### 3.3 minimum working temperature

lowest temperature at which each equipment is designed to operate

### 3.4 maximum allowable working pressure MAWP

maximum pressure of a piping system determined, in general, by the *design pressure* (3.1) of the weakest piping component in the system or by the relief valve setting

Note 1 to entry: The MAWP shall not exceed the design pressure of a piping system.