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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.

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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 22120

Ships and marine technology — Specification for bunkering of methanol fuelled vessels

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ISO/TC 8/SC 25

Secretariat: **ANSI**

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2025-10-27

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Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Abbreviated terms	4
5 Transfer system requirements	4
5.1 Facility requirements	4
5.2 Transfer equipment	5
5.3 Safety equipment	6
5.3.1 ERS	6
5.3.2 ESD system	7
5.3.3 Fire safety systems	8
5.3.4 Insulation connection	8
5.4 Auxiliary systems	8
5.4.1 Mooring equipment	8
5.4.2 Fenders	8
5.4.3 Communication systems	9
5.4.4 Measurement equipment	9
5.5 Maintenance	9
6 Risk assessments	9
6.1 Risk assessment approaches	9
6.1.1 General requirements	9
6.1.2 Qualitative risk assessment (QualRA)	10
6.1.3 Quantitative risk assessment (QRA)	10
6.1.4 Risk assessment scope	10
6.2 Safety distance	11
6.2.1 General requirements	11
6.2.2 Hazardous areas	11
6.2.3 Safety zones	11
6.2.4 Security zones	12
7 Bunkering operational procedures	12
7.1 Pre-transfer stage	12
7.1.1 General requirements	12
7.1.2 Compatibility assessments	12
7.1.3 Confirmation of bunkering conditions	13
7.1.4 Joint bunkering plans	15
7.1.5 Inerting and drying of the bunkering facility's lines	15
7.1.6 Connection of bunker systems	15
7.1.7 ERS	15
7.1.8 ESD connection testing	15
7.2 Transferring stage	16
7.2.1 General requirements	16
7.2.2 Inerting of bunkering lines	16
7.2.3 Bunkering operation	16
7.2.4 Monitoring	16
7.2.5 Topping up of the tank	17
7.2.6 Vapour management	17
7.3 Post-transfer stage	17
7.3.1 General requirements	17
7.3.2 Inerting of bunkering lines	17
7.3.3 Checking after the bunkering	17

7.3.4	Disconnection of pipes	17
7.3.5	Disconnection of communications	18
7.3.6	Document handover	18
8	Safety Protection	18
8.1	Personnel protection.....	18
8.1.1	Personal protective equipment (PPE).....	18
8.2	Fire and explosion protection.....	19
8.2.1	Naked lights, smoking and personnel communication tools	19
8.2.2	Safety earthing of switchboards.....	19
8.2.3	Boilers and diesel engines.....	19
8.2.4	Portable electrical equipment.....	19
8.2.5	Marine radio equipment.....	19
8.2.6	Gas accumulation.....	20
8.3	Safety management.....	20
8.3.1	Openings of the living area	20
8.3.2	Safety zones	20
8.3.3	Security zones.....	21
8.3.4	Stop of bunkering operation	21
9	Personnel training	21
9.1	Vessel personnel training requirements	21
9.2	Additional training requirements for personnel involved in bunkering operations.....	21
9.2.1	General	21
9.2.2	Personnel providing methanol from port or mobile facilities training.....	22
10	Records and documentation	22
	Annex A (informative) Methanol bunker checklists	24
	Annex B (informative) Methanol bunker delivery note (MBDN)	33
	Bibliography	34

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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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.

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

Introduction

This document has been produced to meet an industry need identified by the International Maritime Organization (IMO). This document has been designed to support the IMO International Code of Safety for Ships using Gases or other Low-flashpoint Fuels (IGF Code) and the IMO Interim Guidelines for the Safety of Ships Using Methyl/Ethyl Alcohol as Fuel.

Due to numerous economic and environmental factors, the use of methanol as a vessel's fuel has increased. The increase in methanol fuelled vessels corresponds with an increase in methanol bunkering operations. Therefore, there is a need to standardize methanol bunkering operations internationally to a reasonable degree so that vessel operators will have the tools to select vessel fuel providers that meet set safety standards and methanol bunkering operations will be conducted safely. This document can be used for both vessels involved in international and domestic service regardless of size.

This document does not replace existing laws or regulations. It is flexible so that it can be applied in many situations and under various regulatory regimes as long as the requirements of this document are met. If, however, local regulations preclude its use and do not provide the safety specified in this document, compliance with this document should not be claimed.

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Ships and marine technology — Specification for bunkering of methanol fuelled vessels

1 Scope

This document sets requirements for methanol bunkering transfer systems and equipment used to bunker methanol fuelled vessels. This document includes the following five elements:

- a) transfer systems;
- b) operational procedures;
- c) risk assessment;
- d) safety protection;
- e) personnel training.

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.

ASME B16.5, *Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24, Metric/Inch Standard*

ASTM F1122-22, *Standard Specification for Quick Disconnect Couplings (6 in. NPS and Smaller)*

EN 12115, *Rubber and thermoplastics hoses and hose assemblies for liquid or gaseous chemicals - Specification*

EN 13765, *Thermoplastic multi-layer (non-vulcanized) hoses and hose assemblies for the transfer of hydrocarbons, solvents and chemicals — Specification*

IEC 60079-10-1, *Explosive atmospheres — Part 10-1: Classification of areas — Explosive gas atmospheres*

IEC 60092-502, *Electrical installations in ships — Part 502: Tankers — Special features*

IMO *Interim Guidelines for the Safety of Ships Using Methyl/Ethyl Alcohol as Fuel*

IMO *International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (IBC Code)*

IMO *International Code of Safety for Ships using Gases or other Low-flashpoint Fuels (IGF Code)*

IMO *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW)*

ISO 27126, *Thermoplastic multi-layer (non-vulcanized) hoses and hose assemblies for the transfer of hydrocarbons, solvents and chemicals — Specification*

OCIMF *Design and Construction Specification for Marine Loading Arms* (4th ed, 2019)

OCIMF *Linked Ship/Shore Emergency Shutdown Systems for Oil and Chemical Transfers* (1st ed, 2017)

3 Terms and definitions

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

bunkering

transfer of methanol fuel from land-based or floating facilities into ships' permanent tanks or connection of portable tanks to the fuel supply system

3.2

bunkering facility

facilities with methanol storage and bunkering systems, which can be fixed facilities (e.g. *shore-based bunkering facilities* (3.19)) or *mobile facilities* (3.13) (e.g. *bunkering ships* (3.3), bunkering trucks)

3.3

bunkering ship

a ship provided with methanol tanks, bunker systems and metering equipment and used for the transfer of methanol fuel to a *receiving ship* (3.16)

3.4

Classification Society

non-governmental organization that establishes and maintains technical standards for the construction and operation of ships and offshore structures

3.5

dry disconnect

method that reduces methanol liquid or vapours releases into the atmosphere under normal operation to a negligible amount consistent with safety by equipment design

3.6

emergency release (break-away) coupling

ERC

coupling installed on methanol liquid and vapour lines, as a component of *ERS* (3.7), to ensure the quick physical disconnection of the transfer system from the unit to which it is connected, designed to prevent damage to loading/unloading equipment in the event that the transfer system's operational envelope and/or parameters are exceeded beyond a predetermined point

3.7

emergency release system

ERS

system that provides a safe shut down, transfer system isolation and quick release of hoses or loading arms between the facility or vessel providing the methanol, and the vessel receiving the methanol, preventing product release at disconnection time

3.8

emergency shutdown system

ESD

system that safely and effectively stops the transfer of methanol and vapour between the facility or vessel providing the methanol and the vessel receiving the methanol or vice versa

3.9

fender

large pad absorbing the impact energy to the ship while berthing, which has a sufficient width to keep the ships from contacting with each other or a shore facility

3.10

loading arm

articulated metal transfer system used for transferring methanol to the vessel being bunkered

3.11

lower flammable limit

LFL

concentration of flammable gas or vapour in air, below which an explosive gas atmosphere does not form

3.12

management system

set of procedures an organization needs to follow in order to meet its objectives

3.13

mobile facility

trucks, rail car, ship or other mobile device (including portable tanks) used to transfer methanol to a *receiving ship* ([3.16](#))

3.14

methanol transfer system

all equipment between the delivering facility and the bunkering manifold on the *receiving ship* ([3.16](#))

3.15

recognized organization

competent organization with delegated authority on behalf of an Administration to assist in the uniform and effective implementation of IMO Codes and Conventions

3.16

receiving ship

a vessel that uses methanol as a fuel and does not transport methanol as a cargo

3.17

safety zone

area around the bunkering station where only dedicated and essential personnel and activities are allowed during bunkering

3.18

security zone

area established by the national or local authorities around a *bunkering facility* ([3.2](#)) or area through which vessel and personnel movement is subject to regulatory restrictions

3.19

shore-based bunkering facility

onshore facility which is designed with methanol tanks, bunker systems and metering equipment to directly supply methanol to a *receiving ship* ([3.16](#))

4 Abbreviated terms

Term	Description	Explanation
IBC Code	International Maritime Organization's International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk	The IBC Code applies to ships involved in the carriage of bulk dangerous chemicals and prescribes the design and construction standards of ships involved in such carriage and the equipment they should carry.
IGF Code	International Maritime Organization's International Code of Safety for Ships using Gases or other Low-flashpoint Fuels	The IGF Code applies to ships fuelled by gases or other low-flashpoint fuels. The Code contains mandatory provisions for the arrangement, installation, control and monitoring of machinery, equipment and systems using low-flashpoint fuels.
IACS	International Association of Classification Societies	An organization that establishes, reviews, promotes and develops minimum technical requirements in relation to the design, construction, maintenance and survey of ships and other marine related facilities; and assists international regulatory bodies and standards organizations to develop, implement and interpret statutory regulations and industry standards in ship design, construction and maintenance, with a view to improving safety at sea and the prevention of marine pollution.
IMO	International Maritime Organization	A specialized agency of the United Nations whose purpose is "to provide machinery for cooperation among governments in the field of governmental regulation and practices relating to technical matters of all kinds affecting shipping engaged in international trade; to encourage and facilitate the general adoption of the highest practicable standards in matters concerning efficiency of navigation, and prevention and control of marine pollution from ships."
OCIMF	Oil Companies International Marine Forum	The association was formed in response to the growing public concern about marine pollution, particularly by oil. OCIMF focusses on promoting best practice in the design, construction and operation of tankers, barges and offshore vessels and their interfaces with terminals inshore, onshore and offshore.
STCW	International Convention on Standards of Training, Certification and Watch-keeping for Seafarers	This convention promotes the safety of life and property at sea and the protection of the marine environment by establishing in common agreement international standards of training, certification and watchkeeping for seafarer.

5 Transfer system requirements

5.1 Facility requirements

5.1.1 Mobile facilities including their tanks, piping, hoses, pumps and valves shall be fabricated and conform to meet ISO or other standards recognized by national standards bodies that are ISO members for handling methanol.

5.1.2 The bunkering terminal shall conform to local codes. If local codes do not address methanol bunkering terminals, the terminal operator shall obtain a document issued by a competent organization or individual such as a qualified engineer confirming the terminal conforms to the applicable sections of standards published by ISO and ISO member organizations.

5.1.3 Proper devices or arrangements are to be fitted to the bunkering facility to avoid dispersal or venting methanol vapour to the atmosphere other than when necessary for emergency/safety reasons (e.g. use of vapour return lines from receiving vessel to the bunkering vessel).

5.2 Transfer equipment

5.2.1 All equipment used in the transfer system shall meet the requirements defined for that specific piece of equipment as prescribed in 5.2. All the components of the transfer system shall be fabricated to meet or exceed the applicable sections of the standards indicated in Table 1, as well as the IBC/IGF Codes, in addition to other requirements listed in this document.

Table 1 — Standards containing requirements applicable to transfer system components

Component	Function	Standard(s)
Hoses	Transfer of methanol	ISO 27126 or EN 13765 or EN 12115
Flanges	Product line connections	ASME B16.5
Loading arms	Methanol bunkering loading solution	OCIMF's Design and Construction Specification for Marine Loading Arms, Fourth Edition (2019)
ESD	Emergency shutdown	OCIMF's Linked Ship/Shore Emergency Shutdown Systems for Oil and Chemical Transfers, First Edition (2017)

5.2.2 All flanges used in transfer system shall be at least Class 150 in accordance with ASME B16.5. Flanges shall be of the welded-neck, slip-on or socket-welded type. However, socket-welded-type flanges shall not be used in nominal size above 50 mm.

5.2.3 If dry disconnect couplings of up to and including the nominal pipe size of 6 inches are used, the dimensions and tolerances shall be in accordance with ASTM F1122-22 to meet compatibility requirements.

5.2.4 Materials used in transfer equipment in contact with methanol or its vapour are to be compatible with the characteristics of methanol.

5.2.5 Hoses

5.2.5.1 Bunker hoses shall be approved type and suitable for methanol, and in accordance with applicable requirements of recognized standards, e.g. ISO 27126, EN 13765, EN 12115, etc.

5.2.5.2 Bunker hoses shall be prototype-tested at a normal ambient temperature, with 200 pressure cycles from zero to at least twice the specified maximum working pressure. After this cycle pressure test has been carried out, the prototype test should demonstrate a bursting pressure of at least 5 times its specified maximum working pressure at the upper and lower extreme service temperature. Hoses used for prototype testing should not be used for bunker service.

5.2.5.3 Before being placed in service, each new length of bunker hose produced should be hydrostatically tested at ambient temperature to a pressure not less than 1.5 times its specified maximum working pressure, but not more than two fifths of its bursting pressure. The hose should be stenciled, or otherwise marked, with the date of testing, its specified maximum working pressure and, if used in services other than ambient temperature services, its maximum and minimum service temperature, as applicable. The specified maximum working pressure should not be less than 1 MPa gauge.

5.2.5.4 Each hose assembly shall be visually examined with regards to pressure rating, tightness, other performance data if available and the marking as per the following list:

- (1) manufacturer's name or trademark;
- (2) identification code of nominal specification of the manufacture;
- (3) factory test pressure (equivalent to rated working pressure, maximum working pressure and maximum allowable working pressure);