



International
Standard

ISO 10855-1

**Offshore containers and associated
lifting sets —**

Part 1:
**Design, manufacture and marking
of offshore containers**

*Conteneurs pour une utilisation en mer et dispositifs de levage
associés —*

*Partie 1: Conception, fabrication et marquage des conteneurs
pour une utilisation en mer*

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Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	3
4 Symbols	5
5 Design	5
5.1 General.....	5
5.2 Structural strength.....	6
5.2.1 General.....	6
5.2.2 Lifting loads.....	6
5.2.3 Impact loads.....	8
5.2.4 Internal forces on container walls.....	9
5.2.5 Minimum material thickness.....	9
5.3 Welding.....	9
5.4 Additional design details.....	9
5.4.1 Floor.....	9
5.4.2 Doors and hatches.....	9
5.4.3 Intermediate cargo decks.....	9
5.4.4 Driving ramps.....	10
5.4.5 Internal lashing points.....	10
5.4.6 Forklift pockets.....	10
5.4.7 Top protection.....	10
5.4.8 Pad eyes.....	11
5.4.9 Corner fittings.....	11
5.4.10 Equipment supports and protection.....	12
5.4.11 Coating and corrosion protection.....	12
5.5 Tank containers.....	12
5.5.1 General.....	12
5.5.2 Frame.....	12
5.5.3 Tanks for fluids.....	13
5.5.4 Impact protection on tank containers for dangerous cargoes.....	13
5.6 Containers for bulk solids.....	13
6 Materials	13
6.1 Steel — General.....	13
6.2 Rolled and extruded steels in offshore container structures.....	14
6.2.1 General requirements.....	14
6.2.2 Groups of steels.....	14
6.2.3 Stainless steel.....	15
6.2.4 Steel forgings.....	15
6.2.5 Steel castings in corner fittings.....	15
6.3 Aluminium.....	16
6.4 Non-metallic materials.....	17
6.5 Material documents.....	17
7 Type testing	17
7.1 General.....	17
7.2 Test equipment and calibration.....	18
7.2.1 Test mass or test load.....	18
7.2.2 Calibration.....	18
7.3 Lifting test.....	18
7.3.1 General.....	18
7.3.2 All-point lifting.....	18

ISO 10855-1:2024(en)

7.3.3	Two-point lifting	18
7.3.4	Post-lifting test inspection and examination	19
7.4	Vertical impact test	19
7.5	Other tests	19
8	Production	20
8.1	General	20
8.2	Primary structure	20
8.2.1	General	20
8.2.2	Approved welders	20
8.2.3	Examination of welds	20
8.3	Secondary structure	21
8.4	Production testing	22
8.4.1	Lifting test	22
8.4.2	Weather proofness testing	22
8.5	Failure of production containers	22
9	Marking	23
9.1	Safety marking	23
9.2	Identification markings	23
9.3	Information markings	23
9.4	Other markings	24
10	Container data plate	24
10.1	General	24
10.2	Contents of data plate	24
11	Certificate of conformity	25
11.1	General	25
11.2	Documentation	25
11.3	Contents of the certificate of conformity	26
Annex A (informative) Regulations for offshore containers		27
Bibliography		29

[ISO 10855-1:2024](https://standards.iteh.ai/catalog/standards/iso/9ac4293c-7f0b-4864-83e3-00417a196514/iso-10855-1-2024)

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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 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).

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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 67, *Oil and gas industries including lower carbon energy*, Subcommittee SC 7, *Offshore structures*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 12, *Oil and gas industries including lower carbon energy*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 10855-1:2018), which has been technically revised.

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The main changes are as follows:

- definitions have been updated.

A list of all parts in the ISO 10855 series can be found on the ISO website.

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 ISO 10855 series meets the requirements of IMO MSC/Circ.860 (1998) for the design, construction, inspection, testing and in-service examination of offshore containers and associated lifting sets which are handled in open seas.

The ISO 10855 series does not cover operational use or maintenance.

Under conditions in which offshore containers are often transported and handled, the 'normal' rate of wear and tear is high, and damage necessitating repair can occur. However, containers designed, manufactured and periodically inspected according to the ISO 10855 series have sufficient strength to withstand the normal forces encountered in offshore operations and to not suffer from complete failure even if subject to extreme loads.

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Offshore containers and associated lifting sets —

Part 1: Design, manufacture and marking of offshore containers

1 Scope

This document specifies requirements for the design, manufacture and marking of offshore containers with a maximum gross mass not exceeding 25 000 kg, intended for repeated use to, from and between offshore installations and ships.

This document specifies only transport-related requirements.

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 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method*

ISO 209, *Aluminium and aluminium alloys — Chemical composition*

ISO 1161, *Series 1 freight containers — Corner and intermediate fittings — Specifications*

ISO 1496-1, *Series 1 freight containers — Specification and testing — Part 1: General cargo containers for general purposes*

ISO 1496-3:2019, *Series 1 freight containers — Specification and testing — Part 3: Tank containers for liquids, gases and pressurized dry bulk*

ISO 1496-4:2023, *Series 1 freight containers — Specification and testing — Part 4: Non-pressurized containers for dry bulk*

ISO 3452-1, *Non-destructive testing — Penetrant testing — Part 1: General principles*

ISO 5817, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections*

ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 7500-1, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system*

ISO 9606-1, *Qualification testing of welders — Fusion welding — Part 1: Steels*

ISO 9606-2, *Qualification test of welders — Fusion welding — Part 2: Aluminium and aluminium alloys*

ISO 9712, *Non-destructive testing — Qualification and certification of NDT personnel*

ISO 10042, *Welding — Arc-welded joints in aluminium and its alloys — Quality levels for imperfections*

ISO 10474, *Steel and steel products — Inspection documents*

ISO 10855-1:2024(en)

- ISO 10675-1, *Non-destructive testing of welds — Acceptance levels for radiographic testing — Part 1: Steel, nickel, titanium and their alloys*
- ISO 10675-2, *Non-destructive testing of welds — Acceptance levels for radiographic testing — Part 2: Aluminium and its alloys*
- ISO 11666, *Non-destructive testing of welds — Ultrasonic testing — Acceptance levels*
- ISO 15607, *Specification and qualification of welding procedures for metallic materials — General rules*
- ISO 15609-1, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 1: Arc welding*
- ISO 15614-1, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys*
- ISO 15614-2, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 2: Arc welding of aluminium and its alloys*
- ISO 17636-1, *Non-destructive testing of welds — Radiographic testing — Part 1: X- and gamma-ray techniques with film*
- ISO 17636-2, *Non-destructive testing of welds — Radiographic testing — Part 2: X- and gamma-ray techniques with digital detectors*
- ISO 17637, *Non-destructive testing of welds — Visual testing of fusion-welded joints*
- ISO 17638, *Non-destructive testing of welds — Magnetic particle testing*
- ISO 17640, *Non-destructive testing of welds — Ultrasonic testing — Techniques, testing levels, and assessment*
- ISO 23277, *Non-destructive testing of welds — Penetrant testing — Acceptance levels*
- ISO 23278, *Non-destructive testing of welds — Magnetic particle testing — Acceptance levels*
- EN 10025-1, *Hot rolled products of structural steels — Part 1: General technical delivery conditions*
- EN 10025-2, *Hot rolled products of structural steels — Part 2: Technical delivery conditions for non-alloy structural steels*
- EN 10025-3, *Hot rolled products of structural steels — Part 3: Technical delivery conditions for normalized/normalized rolled weldable fine grain structural steels*
- EN 10025-4, *Hot rolled products of structural steels — Part 4: Technical delivery conditions for thermomechanical rolled weldable fine grain structural steels*
- EN 10088-2, *Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*
- EN 10164, *Steel products with improved deformation properties perpendicular to the surface of the product — Technical delivery conditions*
- EN 10210-1, *Hot finished structural hollow sections of non-alloy and fine grain structural steels — Part 1: Technical delivery requirements*
- EN 10219-1, *Cold formed welded structural hollow sections of non-alloy and fine grain steels — Part 1: Technical delivery requirements*
- EN 10250-2, *Open die steel forgings for general engineering purposes — Part 2: Non-alloy quality and special steels*
- EN 10250-3, *Open die steel forgings for general engineering purposes — Part 3: Alloy special steels*

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

offshore container

portable unit for repeated use in the transport of goods or equipment handled in open seas to, from and between fixed and/or floating installations and ships

EXAMPLE

- general cargo container: closed container with doors;
- cargo basket: open top container for general or special cargo;
- tank container: container for the transport of dangerous or non-dangerous fluids (other types of tanks, e.g. processing plants, storage tanks, that are empty during transport, are considered to be service equipment, and are not covered by this document);
- bulk container: container for the transport of solids in bulk;
- service container: built and equipped for a special service task, usually as a temporary installation e.g. laboratories, workshops, stores, power plants, control stations, accommodation, engine, compressor, generator;
- special container: frame or skid for the transport of special cargo e.g. garbage containers, equipment boxes, gas cylinder racks, IBC (intermediate bulk container) frame.
- offshore waste skip: open or closed offshore container used for the storage and removal of waste.

Note 1 to entry: For the purposes of this document, the maximum gross mass of offshore containers shall not exceed 25 000 kg.

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Note 2 to entry: The unit incorporates permanently installed equipment for lifting and handling and can include equipment for filling, emptying, cooling, heating, etc.

Note 3 to entry: Offshore waste skips are normally constructed from flat steel plates forming the load bearing sections of the container, with bracing in the form of steel profiles (e.g. channel or hollow section) being fitted horizontally and/or vertically around sides and ends. In addition to the pad eyes for the *lifting set* (3.7), these containers can have side-mounted lugs suitable for use with the lifting equipment mounted on a skip lift vehicle.

3.2

permanent equipment

equipment that is permanently attached to the container and which is not cargo

EXAMPLE *Lifting sets* (3.7), refrigeration units, shelves, lashing points, garbage compactors.

3.3

primary structure

load-carrying and supporting frames and load-carrying panels

Note 1 to entry: Primary structure is divided into two subgroups (see 3.3.1 and 3.3.2).

3.3.1

essential primary structure

structural elements which transfer the cargo load to the crane hook, forming the load path from the payload to the lifting set and is non-redundant

EXAMPLE

- top and bottom side rails;
- top and bottom end rails;
- corner posts;
- pad eyes;
- fork pockets.

3.3.2

non-essential primary structure

structural elements whose main function is not essential and can be redundant

EXAMPLE Floor plates and protective frame members.

Note 1 to entry: Side and roof panels, including corrugated panels, are not considered to be part of the *primary structure* (3.3).

3.4

secondary structure

parts which are not considered as load carrying for the purposes of the design calculations, including at least the following components:

- doors, wall and roof panels;
- panel stiffeners and corrugations;
- structural components used for tank protection only;
- internal lashing points

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Note 1 to entry: Not all container walls are corrugated.

3.5

prototype

equipment item, used for type testing, considered to be representative of the product for which conformity is being assessed

Note 1 to entry: It may be either fabricated especially for type testing or selected at random from a production series.

3.6

owner

legal owner of the *offshore container* (3.1) or the delegated nominee of that body

3.7

lifting set

items of integrated lifting equipment used to connect the *offshore container* (3.1) to the lifting appliance

3.8

slings

one leg of a lifting set

3.9 visual examination

examination which uses the human eye as a detector

Note 1 to entry: For the purposes of this document, visual examination shall be in accordance with ISO 17637.

[SOURCE: ISO 9022-1:2016, 2.9.1, modified — Note 1 to entry has been added.]

3.10 non-combustible material

material that does not burn or give off flammable vapours in sufficient quantity for self-ignition when heated to 750 °C

4 Symbols

m_R rating, i.e. the maximum gross mass of the container including permanent equipment and its cargo, in kg, but excluding the lifting set

m_T tare mass, i.e. the mass of an empty container including any permanent equipment but excluding cargo and lifting set, in kg

m_p payload, i.e. the maximum permissible mass of cargo which may be safely transported by the container, in kg

NOTE 1 $m_p = m_R - m_T$.

NOTE 2 m_R , m_T and m_p are expressed in kg. Where design requirements are based on the gravitational forces derived from these values, those forces are indicated thus as $m_R g$, $m_T g$ and $m_p g$, expressed in N.

m_S mass of the lifting set, in kg

T_D design air temperature, i.e. a minimum reference temperature used for the selection of steel grades used in offshore containers and equipment, expressed in °C

σ_e von Mises equivalent stress, expressed in MPa or N/mm²

R_e specified minimum yield stress, expressed in MPa or N/mm²

5 Design

5.1 General

5.1.1 An offshore container shall be designed to allow loading and unloading from supply vessels operating offshore in a sea state with wave heights of 6 m.

NOTE Local impacts, e.g. from hitting other deck cargo or rigid parts of the ship structure, can cause extreme loads in such conditions.

5.1.2 To prevent the containers from overturning (tipping) on a moving deck, they shall be designed to withstand tilting at 30° in any direction, without overturning when loaded at their maximum gross mass, in empty condition or any intermediate condition, and with the centre of gravity considered to be at the half height of the container. For dedicated-purpose containers (e.g. bottle racks and tank containers), the actual centre of gravity shall be used.

5.1.3 Protruding parts on the outside of the offshore container that can snag on other containers or structures shall be avoided. Protruding parts (e.g. doors handles, hatch cleats) shall be so placed or so protected that they do not catch the lifting set.