BRITISH STANDARD

BS EN
12079-1:2006

Offshore containers and associated lifting sets —

Part 1: Offshore containers — Design, manufacture and marking

The European Standard EN 12079-1:2006 has the status of a British Standard

ICS 55.180.10

BSI
British Standards

National foreword

This British Standard is the official English language version of EN 12079-1:2006. Together with BS EN 12079-3:2006 it supersedes BS EN 12079:1999 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee TW/1, Freight containers and swap bodies, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

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

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Offshore containers and associated lifting sets - Part 1: Offshore container - Design, manufacture and marking

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Foreword

This document (EN 12079-1:2006) has been prepared by Technical Committee CEN/TC 280 “Offshore containers and associated lifting sets”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2006, and conflicting national standards shall be withdrawn at the latest by October 2006.

This document, together with EN 12079-3:2006, supersedes EN 12079:1999.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This part of EN 12079 specifies requirements for the design, manufacture and marking of offshore freight and service containers with maximum gross mass not exceeding 25000 kg, intended for repeated use to, from and between offshore installations and ships.

This part of EN 12079 specifies only transport related requirements.

Other parts of the standard are:

EN 12079-2, Offshore containers and associated lifting sets - Part 2: Lifting sets – Design, manufacture and marking

EN 12079-3, Offshore containers and associated lifting sets - Part 3: Periodic inspection, examination and testing

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 287-1, *Qualification test of welders — Fusion welding — Part 1: Steels*

EN 473, *Non destructive testing - Qualification and certification of NDT personnel - General principles*

EN 571-1, *Non destructive testing - Penetrant testing - Part 1: General principles*

EN 970, *Non-destructive examination of fusion welds — Visual examination*

EN 1289, *Non-destructive examination of welds - Penetrant testing of welds - Acceptance levels*

EN 1290, *Non-destructive examination of welds - Magnetic particle examination of welds*

EN 1291, *Non-destructive examination of welds - Magnetic particle testing of welds - Acceptance levels*

EN 1435, *Non-destructive examination of welds - Radiographic examination of welded joints*

EN 1712, *Non-destructive examination of welds - Ultrasonic examination of welded joints - Acceptance levels*

EN 1714, *Non-destructive examination of welds - Ultrasonic examination of welded joints*

EN 10002-1, *Metallic materials — Tensile testing — Part 1: Method of test at ambient temperature*

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 10045-1, *Metallic materials — Charpy impact test — Part 1: Test method*

EN 10164, *Steel products with improved deformation properties perpendicular to the surface of the product - Technical delivery conditions*

EN 10204, *Metallic products — Types of inspection documents*

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*

EN 12517-1, *Non-destructive testing of welds - Part 1: Evaluation of welded joints in steel, nickel, titanium and their alloys by radiography - Acceptance levels*

EN 30042, *Arc-welded joints in aluminium and its weldable alloys - Guidance on quality levels for imperfections (ISO 10042:1992)*

EN ISO 5817, *Welding - Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) - Quality levels for imperfections (ISO 5817:2003)*

EN ISO 7500-1, *Metallic materials - Verification of static uniaxial testing machines - Part 1: Tension/compression testing machines - Verification and calibration of the force-measuring system (ISO 7500-1:2004)*

EN ISO 9606-2, *Qualification test of welders - Fusion welding - Part 2: Aluminium and aluminium alloys (ISO 9606-2:2004)*

EN ISO 15607, *Specification and qualification of welding procedures for metallic materials - General rules (ISO 15607:2003)*

EN ISO 15609-1, *Specification and qualification of welding procedures for metallic materials - Welding procedure specification - Part 1: Arc welding (ISO 15609-1:2004)*

EN 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 15614-1:2004)*

EN 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 15614-2:2005)*

ISO 209-1, *Wrought aluminium and aluminium alloys - Chemical composition and forms of products — Part 1: Chemical composition*

ISO 1161, *Series 1 freight containers — Corner fittings — Specification*

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

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

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

International Maritime Dangerous Goods (IMDG Code)

ATEX Directive 94/9/EC

3 Terms and definitions

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

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.

NOTE The unit incorporates permanently installed equipment for lifting and handling and may include equipment for filling, emptying, cooling, heating, etc.

Offshore containers are subdivided into 3 categories:

3.1.1
offshore freight container
offshore container built for the transport of goods

NOTE Examples of offshore freight containers are:

- general cargo container: A closed container with doors;
- cargo basket: An open top container for general or special cargo;
- tank container: A container for the transport of dangerous or non-dangerous fluids;
- bulk container: A container for the transport of solids in bulk;
- special container: A container for the transport of special cargo e.g. garbage containers, equipment;
- boxes, gas cylinder racks.

3.1.2
offshore service container
offshore container built and equipped for a special service task, usually as a temporary installation e.g. laboratories, workshops, stores, power plants, control stations

3.1.3
offshore waste skip
open or closed offshore container used for the storage and removal of waste

NOTE Normally constructed from flat steel plate 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, these containers may have side mounted lugs suitable for use with the lifting equipment mounted on a skip lift vehicle.

3.2
permanent equipment
equipment that is attached to the container and which is not cargo.

NOTE This may include, e.g. lifting sets, refrigeration units, shelves, securing points, garbage compactors.

3.3
primary structure
load carrying and supporting frames and load carrying panels. Primary structure is divided into two subgroups:

3.3.1
essential /non-redundant primary structure
main structural elements which transfer the cargo load to the crane hook (i.e. forming the “load path” from the payload to the lifting sling) and will include, at least:

- top and bottom side rails;
- top and bottom end rails;
- corner posts;
- pad eyes;
- although other primary structure may also be considered as essential /non-redundant.

3.3.2
non-essential primary structure
other structural elements for which the main function is other than that described in 3.3.1 e.g. floor plates and protective frame members. Side and roof panels, including corrugated panels, are not considered to be part of the primary structure

3.4
secondary structure
parts which are not considered as load carrying for the purposes of the design calculations, including the following components:

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

NOTE 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 claimed. It may either be fabricated especially for type testing or selected at random from a production series

3.6
owner
legal owner of the offshore container or the delegated nominee of that body.

3.7
lifting set
items of integrated lifting equipment used to connect the offshore container to the lifting appliance

3.8
Visual inspection
inspection of the characteristics of a product and determination of its conformity with specified requirements where applicable and based on professional judgement where general requirements apply

3.9
Visual examination
examination in accordance with EN 970

4 Symbols

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

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

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

S mass of the lifting set in kg

NOTE 1 $P = R - T$

NOTE 2 R, T and P are, by definition in units of mass, kilograms (kg). Where design requirements are based on the gravitational forces derived from these values, those forces are indicated thus: Rg, Tg and Pg the units of which are in newtons or multiples thereof.

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 degrees centigrade;

σ_e von Mises equivalent stress, expressed in MPa or N/mm^2;

R_e specified minimum yield stress, expressed in MPa or N/mm^2.

5 Design

5.1 General

5.1.1 An offshore container shall have sufficient strength to allow loading and unloading from supply vessels offshore operating in a sea state with significant wave heights of 6 m and to withstand impact from heavy seas.

NOTE Local impacts, e.g. from hitting other deck cargo or rigid parts of the ship structure, may 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 its maximum gross

mass, 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 may catch other containers or structures shall be avoided. Protruding parts (doors handles, hatch cleats, etc.) shall be so placed or so protected that they do not catch the lifting set.

5.1.4 Where containers are designed for stacking, and the lifting set hangs over the side of the top frame they shall be fitted with a method of protection for those exposed parts, e.g. corners raised to sufficient height above the frame and roof to prevent unintentional contact, with and damage to, the lifting set.

5.1.5 Containers shall be designed as structural frames (primary structure), with non-load bearing cladding where necessary (secondary structure). Only the primary structure shall be considered in the design calculations; however, on certain types of containers, e.g. waste skips with trapezium shaped sides, with only a non-stressed cover above the bracing where the pad eyes are attached, the whole structure may be considered as a primary structure, and the design calculations may treat such a container as a monocoque construction.

5.1.6 T_D shall not be higher than the (statistically) lowest daily mean temperature for the area where the offshore container is to operate and in no case shall be higher than -20 °C.

NOTE 1 For containers with exposed aluminium, the danger of sparks caused by the impact of aluminium against corroded steel (the thermite reaction) should be taken into account.

NOTE 2 When preparing the specification for a service container, it is advised that the rating is chosen higher than the estimated fitted out mass, i.e. to specify a certain payload even if the container is not intended to carry cargo. This will allow for changes in the amount and mass of equipment fitted in a container during its operational life, and it may also be useful to be able to carry a certain amount of non-permanent equipment.

NOTE 3 For containers with special features, additional design requirements may apply. See informative Annex for guidance.

5.2 Structural strength

5.2.1 General

The required strength of a container shall be determined by calculation and verified by type tests, as described in Clause 7.

5.2.2 Lifting loads

5.2.2.1 For design loads defined in 5.2.2.2 and 5.2.2.3, no equivalent stress level, σ_e, shall exceed the figure calculated as $\sigma_{\mathrm{e}} = 0,85\,C$,

where:

for steel: $C = \mathrm{R_e}$

for aluminium: Base material $C = R_{0.2}$

Heat affected zone $C = 0,7\,\beta\,R_m$

where:

R_m is the tensile strength of aluminium

β is 0,8 for ISO AlMg4,5Mn-HAR/AA5083-H32

β is 0,7 for all other aluminium alloys and tempers

(see Table 4**)**

5.2.2.2 Lifting with lifting set

The design force on the primary structure shall be calculated as $2{,}5\ Rg$.

g is the acceleration due to gravity (in m/s^2 i.e. 9,80665).

The internal load shall be taken as $(2{,}5\ R - T)g$ evenly distributed over the container floor. For tank containers, the actual distribution of the tare mass shall be used for the calculations.

Pad eyes shall be designed for a total vertical force of $3\ Rg$.

The force shall be considered to be evenly distributed between $(n - 1)$ pad eyes where n is the actual number of pad eyes.

To determine the resulting sling force on the pad eyes, the sling angle shall be taken into account, so that the resulting sling force on each pad eye is calculated as follows:

$$F = \frac{3R_g}{(n-1)\cos\ v}$$

where:

F is the resulting sling force, in newtons;

n is the actual number of pad eyes (for calculation purposes n shall not exceed 4 and shall be not less than 2);

v is the angle between a sling leg and the vertical, in degrees and shall be assumed to be 45 ° unless otherwise specified.

For containers with only one pad eye, that pad eye shall be designed for a total vertical force of $5\ Rg$.

NOTE Containers without a roof may have insufficient strength and stiffness to pass the 2 point lifting test (7.3.3). In order to avoid building prototypes that will not pass the test, the ability of an open top container to withstand the load occurring in the 2-point lifting test should be checked by a suitable calculation method. In these calculations, the nominal yield stress of the material should not be exceeded. These calculations do not replace the prototype testing.

5.2.2.3 Lifting with forklift truck

The weight of the lifting set shall be taken into account when calculating the strength of the fork pockets.
The design force on the primary structure shall be calculated as 1,6 *(R+S)g.*
The internal load shall be taken as *(*1,6 *(R+S)-T)g* evenly distributed over the container floor.

Where fork pockets are intended only for handling of the empty container, the design load shall be taken as 1,6 *(T+S)g.*

5.2.3 Impact loads

5.2.3.1 General

Impact loads are dynamic loads of very short duration. Ideally, dynamic calculations or tests should be carried out to verify the ability of a container to withstand such loads. However, for most applications it shall be sufficient to carry out simplified static calculations as specified in 5.2.3.2 and 5.2.3.3 and to perform a drop test for vertical impact on corners, in accordance with 7.4.

When simplified calculations are used, and each beam is considered separately, any assumptions concerning support conditions shall be stated.

5.2.3.2 Horizontal impact

The main frame structure shall be dimensioned to withstand a local horizontal impact force acting at any point. This force may act in any horizontal direction on the corner post. On all other frame members in the sides the load may be considered as acting at right angles to the side.

The calculated (static equivalent) stresses due to impact shall be combined with the lifting stresses resulting from static lifting forces (Rg).

Equivalent stresses shall not exceed:

$\sigma_e = C$ (see 5.2.2.1)

The following values shall be used for the static equivalents to an impact force:

For container posts and side rails of the bottom structure: $- 0{,}25\ Rg$

For other frame members of the side structure, including the top rails: $- 0{,}15\ Rg$

Maximum calculated deflections at these loadings shall not exceed:

For corner posts and bottom side rails $\dfrac{1_n}{250}$

where:

1_n is the total length of the rail or post in mm.

For other frame members $\dfrac{1_n}{250}$

where:

1_n is the length of the shortest edge of the wall being considered.

NOTE 1_n is a (nominal) reference length and will often be different from the actual span of a beam.

For horizontal impact on tank containers for dangerous cargoes see 5.5.4.

5.2.3.3 Vertical impact

A vertical impact test shall be carried out in accordance with 7.4. In addition, the side rails and end rails in the base shall be able to withstand vertical point forces of $0{,}25\ Rg$ at the centre span.

Equivalent stresses shall not exceed:

$\sigma_e = C$ (see 5.2.2.1)

Calculated deflections shall not exceed:

$$\frac{1_n}{250}$$

where:

1_n is the total length of the rail.

NOTE Maximum vertical impact forces are likely to occur when a container is lowered onto the deck of a heaving supply vessel. If the deck is at an angle, the first impact will be on a corner. Such impact forces cannot be readily simulated by static forces. As dynamic calculations would be very complex, it is usually sufficient to verify the strength by a vertical impact test as described in 7.4.

5.2.4 Internal forces on container walls

Each container wall, including the doors, shall be designed to withstand an internal force of $0{,}6\ Pg$ evenly distributed over the whole surface, without suffering any permanent deformation.

5.2.5 Minimum material thickness

The following minimum material thickness (t) requirements shall apply.

a) for external parts of corner posts and bottom rails i.e. parts forming the outside of the container:

for $R \geq$ 1000 kg, t = 6 mm;

for $R <$ 1000 kg, t = 4 mm.

b) for all other parts of the primary structure: t = 4 mm;

c) for secondary structure made from metallic materials: t = 2 mm;

d) for waste skips of monocoque design (see 5.1) within an area of up to 100 mm from the side edges : t = 6 mm; for the remaining parts of the side structure: t = 4 mm.

NOTE The thicknesses may have to be increased beyond these values to take account of special considerations such as rating, design, corrosion allowances, the need for impact tests of the material, etc.

5.3 Welding

Essential and non-redundant primary structural members shall be welded with full penetration welds. For other primary structure, the use of fillet welds shall be justified by design appraisal (including calculations and consideration of failure modes).

Intermittent fillet welding of secondary structure is acceptable, however care shall be taken to avoid corrosion.

5.4 Additional design details

5.4.1 Floor

Containers liable to fill with water, e.g. open topped, shall have a suitable drainage facility.

5.4.2 Doors and hatches

Doors and hatches, including hinges and locking devices, shall be designed for at least the same horizontal forces as the primary structure. Locking devices shall be secure against opening of the doors during transport and lifting. Double doors shall have at least one such locking device on each door, locking directly to the top and bottom frame.

Locking arrangements shall be protected to prevent dislodgement by impact.

Hinges shall be protected against damage from impact loads.

Doors shall be capable of being secured in the open position.

If weathertightness is required, the doors shall be equipped with seals.

5.4.3 Intermediate cargo decks

When intermediate cargo decks are fitted they shall be designed to withstand a force of at least 0,5 $Pg\,\Psi$, uniformly distributed

where:

Ψ is the dynamic factor (= 3).

When intermediate cargo decks are designed to support other than half the total payload, the design requirement shall be calculated accordingly.

5.4.4 Internal securing points

Containers for general cargo shall have internal securing points. Each shall be designed to withstand a force of at least $10\ kN$.

NOTE 1 A minimum of 12 is recommended.

NOTE 2 Hinge type lashing points are preferred.

5.4.5 Fork lift pockets

When fitted, forklift pockets shall be installed in the bottom structure and shall have a closed top, pass through the base and be provided with the means to prevent the container from toppling from the forks (see also 9.1).

NOTE 1 Special requirements apply for fork pockets on tank containers for dangerous cargoes, see 5.5.3.

NOTE 2 The bottom face of the pocket may be fully closed but it is recommended that openings be provided to facilitate maintenance and to minimize the risk of loose items being retained in the pockets which could subsequently fall out during lifting operations. These openings should be dimensioned and positioned so as to

minimize the likelihood of the fork tines penetrating or seizing in the opening, or of damaging the free edges at the cut-out.

The minimum internal dimensions of the forklift pockets shall be 200 mm x 90 mm.

Forklift pockets shall be located such that the container is stable during handling and driving with forklift truck. Container length, height, width and rating shall be taken into account.

Pockets shall be located as far apart as practicable but need not be more than 2050 mm apart from the centre of pocket to centre of pocket.

If a container is fitted with pockets that are only for empty handling, the container shall be marked according to 9.1.

5.4.6 Top protection

The top of all open frame containers and of all open top containers with permanent internal fittings, machinery or other installations where crane hooks or forerunners may snag, shall be protected with grating or plates. This may be fixed, hinged or removable. Top protection shall be capable of being secured.

5.4.7 Pad eyes

In order to prevent lateral bending moments on pad eyes, they shall be aligned with the sling to the centre of lift, with a maximum manufacturing tolerance of ± 2,5.

Any difference in the diagonal measurements between lifting point centres shall not exceed 0,2 % of the length of the diagonal, or 5 mm, whichever is the greater.

The diameter of holes in pad eyes shall match the shackle used, clearance between shackle pin and pad eye hole shall not exceed 6 % of the nominal shackle pin diameter. However, maximum concentrated stresses at the hole edges shall not exceed $2 \text{ x } R_e$ at design load.

NOTE 1 It is recommended that the clearance actually provided be as close as practicable to the 6% limit.

The tolerance between pad eye thickness and inside width of shackle shall not exceed 25 % of the inside width of the shackle.

Pad eyes shall be so designed as to permit free movement of the shackle and sling termination without fouling the pad eye.

Pad eyes shall not protrude outside the boundaries of the container other than vertically upward, and shall as far as possible be designed to avoid damage from other containers. Lifting points shall be positioned on the container to preclude, as far as practicable, the risk of slings fouling against the container or its cargo during normal use.

Pad eyes shall be welded to the frame with full penetration welds. If the lifting force is transferred through the thickness of a plate, plates with specified through thickness properties in accordance with EN 10164 shall be used.

NOTE 2 It is recommended that pad-eyes be slotted into the primary structure

NOTE 3 Where ISO-corner fittings are mounted in conjunction with pad eyes, the corner fittings are not intended for lifting with slings offshore.

NOTE 4 Attention is drawn to the need for designers to be aware of the restrictions in permissible shackle types introduced in EN 12079-2 and particularly to the preference for bow shackles with bolt type pin with hexagon head, hexagon nut and split cotter pin. As a result it is necessary that the designer ensure sufficient clearance surrounding the pad eye to enable the fitting and removal of this preferred type.

5.4.8 ISO-corner fittings

Where ISO-corner fittings are mounted to offshore freight containers they shall conform to ISO 1161.

NOTE 1 Lifting offshore with shackles in these corner fittings is not acceptable.

NOTE 2 Where an offshore container does not conform to the dimensional requirements of ISO 668 it is strongly recommended that ISO-corner fittings are not fitted to the top frame

5.4.9 Equipment

Equipment on offshore containers shall be designed and installed to withstand the dynamic loading and other environmental forces to which it may be exposed.

The following factors shall be used:

Dynamic factor (load factor) $\Psi = 3$

Design factor against breaking (safety factor) $s = 2$

NOTE Equipment permanently installed on a container is considered to be part of the container for certification purposes.

Any external connections, e.g. a supply of pressurized air, or an electrical connection, shall be protected against damage.

5.4.10 Coating and corrosion protection

Offshore containers shall be suitable for the offshore environment by means of construction, use of suitable material and/or corrosion and paint protection.

All offshore container roofs, including those constructed from chequer plate, shall be coated with a permanent non-slip medium.

5.5 Tank containers

5.5.1 General

In addition to complying with other relevant design codes and requirements, tank containers shall be suitable for offshore service.

5.5.2 Frame

In addition to the design requirements already specified in this standard, the frame shall be designed to protect the tank and equipment (valves, man-holes, etc.).

5.5.3 Tanks for fluids

Tank design shall conform to the relevant sections of ISO 1496-3.

Tanks for dangerous cargoes shall fulfil the requirements of the IMDG Code, and shall be designed according to a recognized code for pressure vessels. A tank and its support shall be able to withstand lifting and impact loads. In addition due account shall be taken of fluid surge arising from partly filled tanks.

NOTE The IMDG Code has restrictions for loaded handling of tanks over a certain length, by forklift. Reference should be made to Chapters 4.2 and 6.7 of the IMDG Code.

5.5.4 Impact protection on tank containers for dangerous cargoes

On tank containers for dangerous cargoes, all parts of the tank and fittings shall be suitably protected from impact damage. In addition to the requirements of 5.2.3, the following requirements apply:

— the top of the tank and its fittings shall be protected by beams, plates or grating and no part of the tank or its fittings shall extend to within 100 mm of the top of the framework;

— it shall not be possible for any part of the lifting set to foul fittings, manhole cleats or other protrusions on the tank;

— protective beams shall be placed at or near the location where the tank shell is nearest to the outer plane of the sides. Beams shall be spaced sufficiently close together to give the necessary protection;

— at the maximum calculated elastic deflection of any side member, the residual clearance between the member and any part of the tank shell or its fittings shall be at least 10 mm;

— no part of the underside of the tank shell (including sumps), the bottom valves or other fittings, shall extend below a level 150 mm above the bottom of the framework. Any such part extending to within 300 mm of the bottom of the framework, shall be protected by beams or plating;

Tank containers designed with direct connection between the tank and the side or top frame elements shall be subject to special consideration.

5.6 Containers for bulk solids

Bulk containers shall be designed according to the relevant sections of ISO 1496-3 or ISO 1496-4 but shall in addition be suitable for offshore service.

NOTE These may be either pressurized tanks or non-pressurized containers for gravity discharge.

6 Materials

6.1 Steel - General

The chemical composition, heat treatment, weldability, mechanical properties and impact energy properties shall be suitable for the purpose. Extra high strength steels, with RE above 500 N/mm^2, shall not be used.

Materials conforming to standards other than those specified in this clause may be used provided they have properties that can be demonstrated to be equivalent. The standards referenced from this clause shall be the reference standards.

When materials of different galvanic potential are joined together, the design shall be such that galvanic corrosion is avoided.

Welding consumables shall be according to the relevant European standards for welding consumables

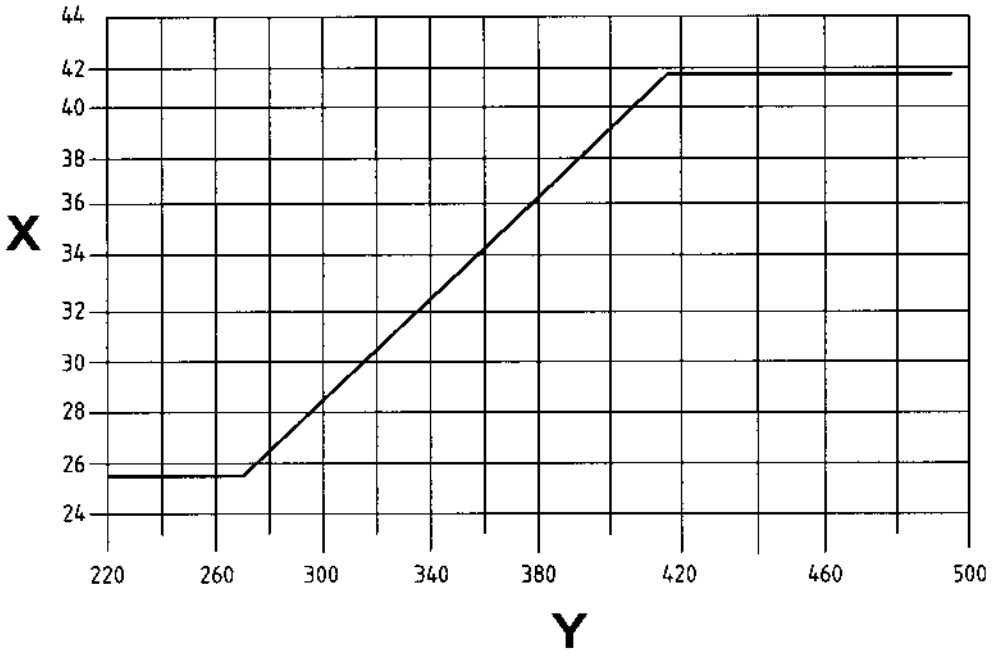
Tensile testing shall be carried out according to EN 10002-1.

In order to avoid initiation of brittle fracture, the steels shall possess adequate fracture energy. Steels for primary structures shall be tested by the Charpy impact (V-notch) method according to EN 10045-1. Test temperatures shall be as given in Table 1.

Table 1 — Charpy impact test temperature - Structural steel for primary structural members

Material thickness (t) in mm	Impact test temperature in °C
$t \leq 12$	T_D + 10
$12 < t \leq 25$	T_D
$t > 25$	T_D - 20

The average energy absorption for base material specimens with their axis parallel to the final rolling direction shall not be less than given in Figure 1. For specimens with their axis transverse to the final rolling direction the valve shall be two thirds of that for longitudinally orientated specimens.



Key
X inpact energy, *J*
Y specified minimum yield stress (RE), N/mm²

Figure 1 — Charpy V - notch, values for steel

6.2 Rolled and extruded steels in offshore container structures

6.2.1 General requirements

Where required, steels for welding shall be made by open hearth, electric furnace or the basic oxygen steel process. Steels in the primary structure shall be killed and fine grain treated. Only materials with non-ageing properties shall be used.

6.2.2 Groups of steels

Structural steels for the primary structure shall be carbon steel, carbon-manganese steel, carbon-manganese micro-alloyed steel or low-alloyed steel.

For hot rolled plates and profiles, material grades specified in EN 10025, Parts 1-4, which meet the requirements in 6.1 and 6.2.1 shall be used.

Hollow sections specified in EN 10210 or EN 10219, which meet the requirements in 6.1 and 6.2.1 shall be used.

6.2.3 Steel forgings

When required forged carbon and carbon-manganese steels shall be used in the offshore container structure.

Such forgings shall be made from fully-killed and fine-grain treated non-ageing steel.

NOTE It may be necessary to verify the non-ageing properties by tests.

For chemical and mechanical properties of alloy steels, reference shall be made to EN 10250-2, *Open die steel forgings for general engineering purposes — Part 2: Non-alloy quality and special steels* and to EN 10250-3, *Open die steel forgings for general engineering purposes — Part 3: Alloy special steels*. The chemical composition shall be suitable for the thickness in question. Alloy steels shall be delivered in quenched and tempered condition.

The impact test temperature shall be equal to the design air temperature, T_D (see 4 and 5.1).

6.2.4 Steel castings in ISO-corner fittings

The tensile strength of ISO-corner fittings (see 5.4.8) made from cast steel shall be not less than 430 N/mm^2 and the yield strength shall be not less than 220 N/mm^2.

The chemical composition shall be in accordance with that set out in Table 2 and mechanical properties shall be in accordance with Table 3.

Table 2 — Chemical composition (ladle analysis) [a]

Chemical Composition %										
C *max*	*Mn*	*Si* *max*	*P* *max*	*S* *max*	*Cr* *max*	*Ni* *max*	*Cu* *max*	*Mo* *max*	Al_{sol} [b] *min*	*Cr+Ni+Cu+ Mo* *max*
0,20	0,90 to 1,50	0,50	0,035	0,035	0,25	0,30	0,20	0,08	0,015	0,70

[a] *The carbon equivalent shall not exceed 0,45%*

[b] *Aluminium may be replaced partly or totally by other fine graining elements as stated in the approved specifications*

Table 3 — Mechanical properties

Mechanical properties				
Yield strength	**Tensile strength**	**Elongation**	**Reduction of area**	**Impact Energy**
R_{oH} [N/mm^2] min	Rm [N/mm^2]	A_5 [%] min	Z [%] min	KV [a] (Joule) min at -20°C
220	430 to 600	25	40	27
[a] Average value on 3 ISO-V notch impact specimens acc. to EN 10045-1. One individual value may be below the average value but shall not be lower than 70 % of the average.				

6.3 Aluminium

The chemical composition, heat treatment, weldability and mechanical properties shall be suitable for the purpose.

When materials of different galvanic potential are joined together, the design shall be such that galvanic corrosion is avoided.

Aluminium alloys used in offshore containers shall be made by rolling or extruding. Aluminium alloys and tempers specified in Table 4 and 5 may be used. Use of other alloys or tempers shall be subject to special consideration.

Table 4 — Aluminium alloys and tempers for rolled products

Alloy		Temper
ISO 209 – 1	**AA**	**ISO / AA**
AlMg 2,5	5052	0 / 0 HAR / H32 HBR / H34 HCR / H36
AlMg 3	5754	0 / 0
		HAR / H32 HBR / H34
AlMg 3,5	5154	0 / 0 HAR / H32 HBR / H34
AlMg 4	5086	0 / 0 HAR / H32 HBR / H34
AlMg 3 Mn	5454	0 / 0 HAR / H32 HBR / H34

Table 4 — Aluminium alloys and tempers for rolled products

Alloy		Temper
ISO 209 – 1	**AA**	**ISO / AA**
AlMg 4,5 Mn	5083	0 / 0 HAR / H32 HBR / H34
AlSiMgMn	6082	0 / 0 TB / T4 TE / T5 TF / T6
NOTE AA = American Aluminium Association. These references are included for information as users may encounter these references in practice.		

Table 5 — Aluminium alloys and tempers for extruded products

Alloy		Temper
ISO 209 - 1	**AA**	**ISO / AA**
AlSi 0,5 Mg	6063	TB / T4 TF / T6
AlSiMgMn	6082	TF / T6
NOTE AA = American Aluminium Association. These references are included for information as users may encounter these references in practice.		

6.4 Non-metallic materials

Timber, plywood, fibre reinforced plastics and other non-metallic materials shall not be used in primary structures.

NOTE Consideration should be given to strength, durability, suitability and possible hazards caused by use of these materials.

6.5 Material certificates

Materials used for the construction of offshore containers shall be furnished with documentation in accordance with Table 6. All materials for primary structures shall be identifiable against the certificates.

Table 6 — Documentation of materials

Structure	Documentation according to EN 10204		
	Inspection certificate 3.1.C	Inspection certificate 3.1.B	Test report 2.2
ISO-corner fittings	X		
Pad eyes	X		
Other primary structural members		X	
Secondary structural members			X

7 Type testing

7.1 General

Any change of design, specification of material and method of manufacture outside normal manufacturing tolerances, which may lead to a modification of the mechanical properties defined in this standard, shall require that the relevant type tests are carried out on the modified container.

NOTE 1 Type tests demonstrate that offshore containers certified as conforming to the requirements of this standard possess the mechanical properties specified. The purpose of these tests is to prove the design, material and method of manufacture.

A container selected for type testing shall be representative of the production units and not a hand built pre-production development container. It shall be built in conformity with plans and data and using tooling comparable to those planned for subsequent production.

The tests described in 7.3 and 7.4 are required for all offshore container types, and shall be considered as design requirements.

NOTE 2 Type testing may not replace design review, but may in certain cases be a partial substitute for strength calculations. Non-destructive examination (NDE) may be required after testing.

The test masses/ test load shall normally be evenly distributed inside the container. If it is not possible to place all the test mass inside the container, some of it may be placed outside or under the container, provided that this gives a loading on the structure similar to the distribution of the container loading in operating condition.

If the container has an additional cargo deck, the test mass/ test load shall be evenly divided between the floor and the additional deck, see 5.4.3. If the additional deck is removable, it will be necessary to carry out the test with the test mass/ test load divided between the additional deck and the floor, as well as with the whole test mass/ test load, on the floor.

NOTE 3 For containers with special features where additional design requirements apply, suitable tests should be made to verify that those requirements are met. See informative Annex for guidance.

7.2 Test equipment and calibration

7.2.1 Test mass / test load

The test mass (or test load) shall be verified using calibrated weights or a calibrated load cell and handset.

NOTE Examples of appropriate means of application of test mass/ test load are:

— calibrated test blocks;

— water bags;

— sand bags;

— free weights;

— a suitable test rig.

7.2.2 Calibration

If a load cell and hand set is used it shall be calibrated annually, in accordance with EN ISO 7500-1, to an accuracy of ± 2 %.

NOTE 1 Should a load cell be overloaded or receive a shock load (e.g. from being dropped) it is recommended that the load cell and handset be re-calibrated before further use.

Where used, test blocks shall be calibrated, as a minimum, every second year in accordance with acceptable international or national standards. The measured mass, in kilograms, of each block shall be legibly and durably marked on each block.

NOTE 2 Care should be taken in the storage of calibrated concrete blocks so as prevent the absorption of water having an influence on the actual block mass.

7.3 Lifting test

7.3.1 General

The container shall be lifted by a lifting set with an angle to the vertical equal to the design angle. The container shall be clear of the ground throughout the test.

NOTE Where the lifting set intended for use with the container is used for the lifting test, care should be taken to ensure that no overloading, deformation or distortion is induced in the lifting set. Should the lifting set normally fitted to the container be used for the lifting test it should be visually inspected after the load test.

The container shall be carefully lifted in such a way that no significant acceleration forces occur. It shall be held for 5 minutes before measurements are taken.

7.3.2 All-point lifting

The container shall be loaded to give a total mass of $2{,}5\ R$ and lifted clear of the ground, using all the pad eyes.

NOTE This total mass may be obtained by putting in an internal test mass of $2{,}5\ R\text{-}T$.

No deflections during testing shall be greater than 1/300 of the span of the member. The offshore container shall show no permanent deformation or other damage after testing.

7.3.3 Two-point lifting

An offshore container fitted with four pad eyes shall also be lifted from only two pad eyes, situated diagonally opposite each other, with a total mass of $1{,}5\ R$.

The offshore container shall show no permanent deformation or other damage after testing.

7.3.4 Post-lifting test inspection and examination

On completion of the lifting test, a non-destructive examination and visual inspection of the pad-eyes, shall be carried out.

7.4 Vertical impact test

The container, with its internal test mass corresponding to payload P, shall be either lowered or dropped on to a workshop floor of concrete or other rigid structure.

NOTE 1 This floor may be covered with a sheathing of wooden planks with a thickness not exceeding 50 mm.

NOTE 2 If the container is lowered from a crane, the suspending wire and hook may dampen the impact compared to a free-fall drop test. Therefore the impact speed should be greater if a lowering test is used.

In both cases, the container shall be so inclined that each of the bottom side and end rails connected to the lowest corner forms an angle of not less than 5 ° with the floor.

However, the greatest height difference between the highest and lowest point of the underside of the container corners need not be more than 400 mm.

The impacting corner shall be the one expected to have the lowest rigidity.

NOTE 3 On closed dry cargo containers this will normally be at the door end.

No significant permanent damage shall occur.

NOTE 4 Cracks in welds and minor deformations may be repaired.

One of the following procedures shall be carried out:

a) Drop test

   An internal load equal to the payload (P) shall be safely secured and the container shall be inclined as described above.

   The container shall be suspended from a quick release hook. When released, the container shall drop freely for at least 50 mm to give it a speed at initial impact of at least 1 m/s.

b) Lowering test

   An internal load equal to the payload (P) shall be safely secured and the container shall be inclined as described above.

   The container shall be lowered to the floor at a constant speed of not less than 1,5 m/s.

NOTE 5 WARNING: These tests may cause considerable tremors in the building!

7.5 Other tests

7.5.1 Open top containers with an overall length of 6.5m or more, with fork pockets designed for loaded lifting shall be loaded to a total uniformly distributed gross mass of 1.6(R+S)g and lifted clear of the ground using the fork pockets. No deflections during testing shall be greater than 1/300 of the span of the member. The offshore container shall show no permanent deformation or other damage after testing.

7.5.2 Tanks for dangerous cargoes shall be tested according to the requirements of the IMDG Code.

8 Production

8.1 General

Production shall be performed according to approved drawings, specifications and procedures.

Production documents according to this standard shall be prepared and approved before production starts.

The manufacturer shall ensure the quality of the procedures and facilities used through operation of a quality assurance system at least in accordance with EN ISO 9001.

8.2 Primary structure

8.2.1 General

During production it shall be possible to identify the materials used for the primary structure and link them with the corresponding documentation. If the marking is not visible on the finished product, a log shall be kept of the components to identify and ensure traceability of the materials used in the primary structure.

8.2.2 Approved welders

Welders shall be approved in accordance with EN 287-1 and EN ISO 9606-2, as appropriate to the materials being used.

8.2.3 Welding procedures

Approved welding procedures shall be used for the welding carried out on the primary structure.

Preliminary welding procedure specifications shall form the basis for the preparation of welding procedure tests.

Welding procedure specifications, welding procedure tests and approval of welding procedures shall be in accordance with EN ISO 15607, EN ISO 15609-1, EN ISO 15614-1 or EN ISO 15614-2 as appropriate and with the requirements stated below.

Impact tests are required as part of the welding procedure tests. Test temperatures and test results shall comply with the requirements given in 6.1 including Table 1. For $t > 12$ mm four sets of impact tests shall be made: one set in the weld metal, one set at the fusion line, one set in the heat affected zone (HAZ) 2 mm away from fusion line and one set 5 mm away from fusion line.

8.2.4 Examination of welds

8.2.4.1 General

Welds shall be subject to visual examination as specified in Table 7.

The percentages specified in Table 7 shall apply to the total length of weld for the type of structural assembly in question.

Welds between essential non-redundant and non essential primary structures shall be examined as for non-essential primary structures.

When fuel gas welding is applied, ultrasonic and magnetic particle examination shall be required in addition to radiographic examination.

Table 7 — Non-destructive examination (NDE) of structural welds

Category of member	Type of examination			
	I Visual examination	II Magnetic particle examination [a]	III Ultrasonic examination [b]	IV Radiographic examination [b]
Essential / Non-redundant Primary structure	100 %	100 %	100 % Pad eyes 20 % all other	10 %
Non essential primary structure	100 %	20 %	20 %	10 %
Secondary structure	100 %			

[a] Dye penetrant examination shall be used where magnetic particle examination is not possible.

[b] Depending on material thickness and possibility.

NOTE: The categories applicable to the structural members shall be agreed with the body certifying the container in each case.

8.2.4.2 Non-destructive examination (NDE) methods

NDE methods, see Table 8, shall be chosen with due regard to the conditions influencing the sensitivity of the methods. Structural welds shall be examined as stipulated in columns I to IV in Table 7 with those in columns III or IV being employed in the event that such is relevant.

Table 8 — Standards relevant to NDE methods

Visual	Magnetic particle	Dye Penetrant	Ultrasonic	Radiography
EN 970	EN 1290	EN 571-1	EN 1714	EN 1435

8.2.4.3 Weld acceptance criteria

Table 9 - NDE acceptance criteria

Visual	Magnetic Particle	Dye Penetrant	Ultrasonic	Radiography
EN ISO 5817 [a]	EN 1291	EN 1289	EN 1712	EN 12517-1
Level B	Level 1	Level 1	Level 2	Level 1
[a] for aluminium EN 30042				

8.2.4.4 Non-Destructive Examination (NDE) Operators

NDE operators shall be qualified, in accordance with EN 473, to a minimum of level 2.

NDE operators shall undertake non-destructive examination in accordance with Table 7 and issue reports describing weld quality, containing the following information as a minimum:

— number of repairs carried out to meet the specified acceptance standard;

— NDE methods and procedures used;

— NDE-parameters necessary for a proper assessment;

— confirmation of acceptance or rejection.

8.3 Secondary structure

The fabrication procedure shall reflect the requirement that the secondary structure shall prevent cargo from falling out of the offshore container and, if required, prevent water from entering.

Welds between primary and secondary structures shall be performed as for secondary structures and shall be examined as such.

The welding procedure used for the secondary structure shall be in accordance with EN ISO 15607, EN ISO 15609-1, EN ISO 15614-1 or EN ISO 15614-2 as appropriate.

8.4 Production testing

8.4.1 Lifting test

During the production of a batch of offshore containers, some, selected at random, shall be submitted to the all-point lifting test described in 7.3.2 and shall meet all specified requirements.

The number of containers to be tested shall be agreed in advance and is dependent on the total number in the production series. Table 10 shall be used to determine the minimum number of containers to be tested which shall include the container which was type tested.

Table 10 — Number of containers required for lifting test

Total number in series	Number to be tested [a]
1 – 5	1
6 – 10	2
11 - 20	3
21 – 40	4
≥ 40	10%
[a] The quantity given includes the container which was type tested.	

8.4.2 Weatherproofness testing

If a type of offshore container is specified to be weatherproof, the following weatherproofness tests shall be carried out.

For the prototype and 10 % of the containers in a production series, the test shall be carried out in accordance with the weatherproofness test specified in ISO 1496-1.

For the remaining containers, the water test may be replaced by a simple light test for which the inspector shall proceed as follows:

— enter the container, require the doors to be closed and allow sufficient time to become accustomed to the darkness (at least 3 minutes);

— while a powerful light is directed at all external surfaces, examine the interior of the container for light penetration;

— no light penetration shall be observable with the naked eye or with normally corrected vision.

NOTE Appropriate provision should be made to ensure that there is no risk to the health and safety of the inspector

8.5 Failure of production containers

In the case of failure of any container to meet either the weld acceptance criteria (see 8.2.4.3) or the lifting test requirements (see 7.3.1 and 8.4.1) the manufacturer shall identify the cause of failure and rectify all affected containers. The rectified containers shall then be re-inspected and/or re-tested.

9 Marking

9.1 Safety marking

The tops of closed containers and the top rails of open and framed containers shall be marked as follows:

— closed containers shall be marked with a band of solid contrasting colour not less than 100 mm wide round the roof perimeter; if the roof of the container is recessed below the top perimeter rail, at least the top surface of the top rail shall be marked;

— open and framed containers, shall be marked on the top surface of the top rails with either hatching in a contrasting colour or a solid light colour.

Where a container is fitted with fork pockets designed for handling the container only when empty (e.g. on some tanks and long baskets) then the words "Empty lift only" shall be clearly displayed near each set of fork pockets in characters not less than 50 mm high.

NOTE Aluminium containers may need to be specially marked to warn of the danger of sparking (see 5.1). The recommended marking is 'ALUMINIUM CONTAINER' on all four sides in letters at least 75 mm high.

9.2 Identification markings

Each container shall have the fabricator's serial number welded on in characters at least 50mm high. In addition, each container shall be marked with a unique container number, issued by the owner, as a prime identifier for use as the common cross-reference on all in-service certification and shipping documentation.

The container number shall be prominently and indelibly displayed on all sides of the container (as viewed from ground level) in characters of a contrasting colour, not less than 75 mm high.

NOTE 1 For open sided containers it may be necessary to attach panels specifically to carry the container number.

If a container has a roof, the container number shall be displayed on the roof, in characters 300 mm high or more. Where character size is restricted by the available space they should be as large as practicable. The marking shall be carried out in such a way as to avoid incorrect interpretation (e.g. by underlining). Where applicable the lower edge of the marking shall be positioned near the side of the container in which the door is located.

NOTE 2 In exceptional circumstances the owner may change the container number and re-mark the container accordingly. In this case the inspection plate should be replaced (Clause 10) and the certificate of conformity revised (Clause 11).

9.3 Information markings

Each container shall be clearly marked with:

a) relevant electrical hazard classification and zone marking according to ATEX Directive (94/9/EC)

b) relevant dangerous goods placarding in accordance with the IMDG Code.

NOTE 1 Placarding should be removed when container no longer contains dangerous goods.

c) maximum gross mass (in kg)

d) tare mass (in kg)

e) payload (in kg)

c), d) and e) shall be displayed in characters of a contrasting colour not less than 50mm high.

NOTE 2 A matt black panel of appropriate size may be provided for the application of temporary information. It is recommended that this panel be located on a door, where fitted. Other information e.g. destination may be added if desired.

9.4 Other markings

If the container is fitted with an intermediate deck the payload of the deck shall be displayed on the inside of the container in a position where it is clearly visible at all times, in characters of a contrasting colour not less than 50 mm high.

The user of the container may add additional information marking such as owners name, etc. However, to avoid misinterpretation additional marking shall be kept to a minimum.

10 Container Data Plate

10.1 General

Containers shall be fitted with a plate carrying the information specified in 10.2

The plate shall be made of corrosion resistant material securely attached externally in a manner designed to avoid unauthorized or accidental removal. The plate shall be fitted to a door, or, on containers with no doors, in a prominent position.

Aluminium rivets have been found to be unsuitable as a fixing method in the offshore environment and shall not be used.

The information on the plate shall be in the English language.

NOTE Provision for an additional language may be made.

The text shall be permanently and legibly marked on the plates in characters not less than 4 mm high.

10.2 Contents of Data Plate

The plate shall be headed:

"OFFSHORE CONTAINER DATA PLATE — EN 12079-1:2006

The plate shall contain the following information:

- fabricator's serial number;
- month and year of manufacture;
- maximum gross mass in kilograms excluding lifting set at the design sling angle;
- tare mass in kilograms;
- payload in kilograms and intermediate deck payload (if applicable);
- certificate of conformity number;
- design temperature;
- Identification of body issuing the certificate of conformity.

NOTE 1 A recommended format for the plate is shown in Figure 2.

NOTE 2 The data plate may be combined with the inspection plate by including the additional information specified in Clause 5 of EN 12079-3.

OFFSHORE CONTAINER DATA PLATE EN 12079-1:2006 Fabrication no: Month and year of manufacture:		
Maximum gross mass excluding lifting set	kg at	# # Degrees from Vertical
Tare mass: Payload: Container Intermediate deck Certificate no:	kg kg kg	
Design temperature:	°C	

Figure 2 — Example of Data Plate Layout

11 Certificate of conformity

11.1 General

All containers to be used offshore shall be issued with a certificate of conformity to this standard.

The certificate shall be retained by the owner.

In addition, certificates of examination and tests shall be issued as described in 11.2.

Containers, which are required to comply with the requirements of the IMDG Code, shall also be certified in accordance with the IMDG Code.

Each container shall have its own fabricator's serial number as specified in 9.2.

11.2 Documentation

The certificate of conformity shall be based on the following documentation collated in an "as built" dossier, which shall be retained by the fabricator for at least five years:

- structural calculations;
- drawings including a general arrangement drawing;
- specifications for welding procedures (WPS);
- welders certificates;
- material certificates;
- report on traceability of materials, in the primary structure;
- report from fabrication inspection;
- report from dimensional control;
- report from non-destructive examination (NDE);
- report from prototype testing;
- report from proof testing;
- report from final inspection.

NOTE It is recommended that information from the “as built dossier” that is not considered commercially sensitive should be copied to the owner who should retain it for the life of the container.

11.3 Contents of the certificate of conformity

The certificate of conformity shall contain the following information:

- fabricator's serial number;
- certificate of conformity number;
- description of the container including:

a) external dimensions;

b) number of lifting points;

c) name of fabricator;

d) month/year of fabrication;

e) maximum gross mass excluding lifting set in kg;

f) tare mass excluding lifting set in kg;

g) payload in kilograms;

h) reference to the as built dossier;

i) the total mass in kg applicable to the all-points lifting test for the batch of containers tested as specified in 8.4.1;

j) angle of lifting set legs (from vertical);

k) minimum nominal shackle bolt diameter.

— conformity to other requirements and/or codes;

— statement that the container described has been designed, fabricated and tested in accordance with EN 12079-1;

— fabricator's serial numbers of those containers from the production batch subject to test in accordance to 8.4.1;

— remarks;

— signature on behalf of the body issuing the certificate of conformity.

Annex A
(Informative)

Certification Requirements for Containers

Several international and national certification schemes are applicable for various categories of portable containers. Several of these certification schemes are or may be applicable for offshore containers as defined in this standard.

General certification requirements for offshore containers

The International Maritime Organization. IMO, has issued guidelines for certification of offshore containers, in circular MSC/Circ.860.

This circular is intended to guide national authorities in developing approval and certification requirements for offshore containers. It recommends that new offshore containers be approved, prototype tested and certified by duly authorized bodies.

International Requirements for Freight Containers

Freight containers, as defined in the International Convention for Safe Containers (CSC), are required to be certified to that convention. Offshore containers are usually not covered by the CSC. However, offshore containers that fall within the definition of a container in the CSC, and which are used internationally for transport of cargo, must also be certified to that convention.

Tank Containers for Dangerous Goods

All tank containers intended for marine transport of dangerous goods need to be certified to the International Maritime Dangerous Goods Code (the IMDG Code). Tank containers built after January 1st 2003 must be built and certified according to the requirements for UN type tanks (Ch. 6.7 in the IMDG code). Tank containers built before that date may be in accordance with Chapter 13 of the older IMDG code (i.e up to amendment 29 of that code.) Tank containers that are certified according to these requirements are also allowed for road and rail transport.

Additional requirements for offshore service containers

In addition to the transport related requirements covered by EN 12079 and the regulations described above, offshore containers may be designed or equipped for special service tasks, (e.g. laboratories, control stations, workshop, accommodation, stores, power plants, process units).

Such service containers, as defined in paragraph 3.1.2, may be subject to safety regulations applicable on the offshore installations where they are used. The safety regulations may apply for various types of installations, systems and equipment in the container. This may include, but is not restricted to:

- Fire protection
- Electrical equipment
- Gas detection systems
- Ventilation systems

- Alarms and PA systems
- Noise and vibration
- Pressurized equipment
- Emergency exits

ATEX (EC Directive 94/9)

This directive addresses electrical and mechanical issues for offshore containers.

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[7] EN 12079-2, *Offshore containers and associated lifting sets - Part 2: Lifting sets - Design, manufacture and marking*

[8] EN 12079-3, *Offshore containers and associated lifting sets - Part 3: Periodic inspection, examination and testing*

[9] EN ISO 9001:2000, *Quality management systems - Requirements (ISO 9001:2000)*

[10] ISO 668, *Series 1 freight containers -- Classification, dimensions and ratings*

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