



TECHNICAL SPECIFICATIONS FOR PURPOSE-BUILT CONTAINERS

SCOPE

This specification covers the design, construction, materials, testing, inspection, and performance requirements for purpose-built containers.

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1. GENERAL

1.1. OPERATIONAL ENVIRONMENT

The container will be designed and constructed for the transportation on sea (above or under deck) and on land throughout the world, and will be suitable for the environmental conditions imposed by those modes of transport. All materials used in the construction will be able to withstand extreme temperatures ranging from -20C to 80C without effect on container's strength and watertightness.

1.2. STANDARDS AND REGULATIONS

Containers shall comply with following in their latest editions:

1.2.1. ISO/TC-104

- 668 Series 1 freight containers-Classification, external dimensions and ratings
- 6346 Coding, identification and marking for freight containers
- 1161 Specification of corner fittings for series 1 freight containers
- 1496/1 Specification and testing of series 1 freight containers
Part 1 : General cargo containers for general purposes
- 830 Freight containers-Terminology
- 6359 Freight containers-Consolidated date plate

1.2.2. The International Convention for Safe Containers (CSC).

To satisfy the requirements of rules of classification society.

2. APPROVAL AND CERTIFICATES

2.1. CLASSIFICATION AND CERTIFICATE - All the containers shall be certified for design type and individually inspected by the classification society.

2.2. PRODUCTION CERTIFICATE

The Production Certificate of series containers to be issued by the classification society. The Society's seal shall be provided.

2.3. CSC CERTIFICATE

All the containers will be certified and comply with the requirements of the International Convention for Safe Containers.



3. HANDLING

The container will be constructed to be capable of being handled without any permanent deformation which will render it unsuitable for use or any other abnormality during the following conditions :

- 1) Lifting, full or empty, at the top corner fittings vertically by means of spreaders fitted with hooks, shackles or twistlocks.
- 2) Lifting, full or empty, at the bottom corner fittings using slings with appropriate terminal fittings at slings angle of thirty (30) degrees.

4. TRANSPORTATION

The container shall be constructed to be suitable for transportation for following modes without any permanent deformation which will render the container unsuitable to use or any abnormality.

A) Marine: On the deck: Two (2) high stacked and secured by suitable vertical and diagonal wire binding.

Rigidity capacity:

7,620 kg (16,800 lbs) transversely

3,810 kg (8,400 lbs) longitudinally

B) Road: On flat bed or skeletal chassis to be secured at 4 bottom corner fittings by twist locks or equivalent securing devices.

C) Rail: On flat cars or special container carrying wagons to be secured at 4 bottom corner fittings by twist locks or equivalent securing devices.

5. DIMENSIONS AND RATINGS

Maximum allowable differences between two diagonals on any one of the following surfaces are as follows:

Roof, Bottom and Side Diagonals 19 mm

Front and Rear Diagonals 10 mm

5.1. 20Ft HC OVERALL DIMENSIONS

	External Dimensions	Internal Dimensions
Length	6,058 (0, -5) mm	5,898 (0, -5) mm
Width	2,438 (0, -5) mm	2,350 (0, -5) mm
Height	2,896 (0, -5) mm	2,698 (0, -5) mm

Note: Internal dimensions may vary due to design.



5.2. 40Ft HC OVERALL DIMENSIONS

	External Dimensions	Internal Dimensions
Length	12,192 (0, -10) mm	11,982 (0, -10) mm
Width	2,438 (0, -5) mm	2,352 (0, -5) mm
Height	2,896 (0, -5) mm	2,696 (0, -5) mm

Note: Internal dimensions may vary due to design.

5.3. GOOSENECK TUNNEL DIMENSIONS

Length	3,315 mm
Width	1,029 mm (+3, 0)
Height	120 mm (0, -3)

5.4. 20Ft HC RATING

Max. Gross Weight	10,000 kg	22,046 lbs
Tare Weight	3,200 kg	7,055 lbs
Max. Payload	6,800 kg	14,991 lbs

Note: Subject to actual weighing.

5.5. 40Ft HC RATING

Max. Gross Weight	15,000 kg	33,070 lbs
Tare Weight	6,100 kg	13,448 lbs
Max. Payload	8,900 kg	19,622 lbs

Note: Subject to actual weighing.

6. CONSTRUCTION

6.1. GENERAL

The container will be constructed with steel frames, fully vertically corrugated steel side and end walls, die-stamped corrugated steel roof, flooring and ISO corner fittings at eight corners. All steelworks will be built up by means of automatic and semi-automatic CO2



gas arc welding (MAG welding), or superior welding process. All exterior weldings including that on base structure will be continuous to give perfect watertightness. All the welds, even spots, will have full penetration without undercutting or porosity. Interior welds can be intermittent with a minimum bead length of 25 mm for every 150 mm. Flooring is fixed to the cross members by self-tapping screws. All crevices will be sealed with an elastic sealing compound.

6.2. CORNER FITTINGS

Corner fittings will be designed in accordance with ISO/1161 standard, and manufactured at the workshops approved by the classification society. Steel Cover of corner fittings used on both ends to prevent floor to be cracked.

6.3. BASE FRAME

The base frame will be composed of two (2) bottom side rails, a number of crossmembers, which are welded together as a sub-assembly.

6.3.1. UNDERSTRUCTURE

Crossmembers are composed of a number of small pressed channel section and some large one located beneath each board joint of the plywood or fiber cement board with certain center distance. 3 pcs 4.0 mm thickness ribs will be welded on each joint crossmember.

6.4. FRONT END

The front end will be composed of two corner posts, one top end rail, one bottom end rail, four corner fittings and corrugated end wall, which are welded together as a sub-assembly.

6.5. REAR END

Rear end is composed of Rear End Frame which consists of two corner posts, one rear header with header plate, one door sill, and four corner fittings, which are welded together as a sub-assembly, and Door Systems which are with locking devices.

6.6. SIDE WALL ASSEMBLY

The side walls will be continuously welded to each other and to the side rails and corner posts. Each side wall will be composed of a number of sheets for the intermediate (inner) parts and other panels at each end of side wall, fully corrugated into trapezium section, but welded together to form one panel by automatic welding.

6.7. ROOF

The roof will be constructed by several die-stamp corrugated steel sheets with a certain upwards camber at the center of each trough and corrugation, these sheets are butt jointed together to form one panel by automatic MAG welding.



6.8. FLOOR

The floor consists of marine grade plywood or fiber cement board.

Floor thickness: 25-28 mm

Floor material: Marine grade plywood (28mm) or fiber cement board (25mm).

- 6.8.1. The floor boards are longitudinally laid on the cross member with a free floating flat bar joint at the center and two angles steel along both side rails. The floor boards are tightly secured to each cross member with self-tapping electro-zinc plated steel screws and countersunk below the level of the upper surface of the floor by 2.0 mm to 2.5 mm.

6.9. SEALANT FOR JOINTS

Chloroprene sealant will be caulked at inside unwelded seams and visible seam of floor board periphery. Butyl sealant will be caulked at invisible seam of floor joint area and between door gasket and frame. Silicon sealant will be caulked at both ends of gasket rivets.

7. PRESERVATION

7.1. SURFACE PREPARATION OF THE STEELWORK

- 1) All the steel surface prior to forming or after will be degreased and shot blasted to Swedish Standard SA 2.5 to obtain the surface roughness at 25 to 35 microns which can result in the removal of all the rust, dirt, mill scale and all other foreign materials.
- 2) Locking rod assemblies, which are welded with gear cams, bars holder and handle hinges, are hot-dipping galvanized (thickness : 75 microns).
- 3) All fasteners such as bolts / nuts, washers, self-tapping screws, which are not mentioned in this Spec. will be electro zinc plated to 13 microns.

7.2. COATING

7.2.1. PRIOR TO ASSEMBLY

A weld-able primer compatible to the paint system will be applied immediately after shot blasting to a thickness of 10 to 15 micron to preserve the surface integrity during the assembly process. All welds and any other area that was contaminated during the assembly process to be cleaned by standard practice. Slags and spatters to be removed by means of grinding or needle hammers.

7.2.2. AFTER ASSEMBLY

All the weld joints will be shot-blasted to remove all the welding fluxes, spatters, burnt primer coatings caused by welding heat, and other foreign materials, and followed with the secondary paint operation immediately.

- 7.2.3. All the surface of the assembled container will have coating system as follows:



Process	Paint Name	DFT in microns
Exterior	Epoxy zinc rich primer	30
	Epoxy primer	50
	Acrylic topcoat: any RAL color	40
	Total	120
Interior surface	Epoxy zinc rich primer	30
	Epoxy primer	50
	Acrylic topcoat: any RAL color	40
	Total	120
Under structure	Epoxy zinc rich primer	30
	Undercoating (waxy or bituminous)	200 (steel parts) 100 (floor)
	Total	230 for steel and 100 for floor

Note : (i) Zinc rich epoxy and topcoat are not applied to the floor.
(ii) Use of solvent based paints is also permitted.

8. MARKINGS

8.1. LETTERING

The containers will bear the following letters in accordance with ISO and the owner's requirements. The markings consist of the following contents:

- 1) Owner's emblems according to owner's design.
- 2) Owner's code, serial number and check digit.
- 3) Size and type code.
- 4) Weight details
- 5) Other marking: According to owner's requirements.
- 6) Lettering and numbers shall be written in English with the color of RAL 9010 (Pure White) or RAL 9005 (Jet Black).



8.2. MATERIALS

The material of all decals is seven years life guarantee against failure.

8.2.1. The containers will bear some of the marking plates in accordance with the requirements of the Classification Authorities and owner such as mentioned in this specification. The plate will be permanently riveted to the specified position by rivets and sealant.

Plate material : 0.8 mm Stainless steel SUS304
Plate treatment : Chemically etched & enameled
Rivets material : Stainless steel SUS304

8.2.2. Contents of the Plate :

- 1) Owner's plate (name and address).
- 2) CSC approval No.
- 3) Date of manufacture (year-engraved, month-stamped).
- 4) Owner's serial number (stamped).
- 5) Owner's model number.

9. TESTING AND INSPECTION

9.1. PROTO-TYPE CONTAINER

Proto-type container to be manufactured in accordance with this specification and shall be tested according to procedures described in the ISO 1496/1 and the Classification Society's requirements. The containers will be fabricated & tested in advance of the mass production.

9.2. CONTAINER IN MASS PRODUCTION

9.2.1. Every container in mass production shall be manufactured under effective quality control procedures to meet the specified standards. After completion, all the containers shall be subject to dimension check, door operation check, light leakage test & weather-proofness test. The containers shall be inspected by the surveyor of Classification Society and identified by the appropriate society seal.

9.3. The Proposed Criteria Table for General Prototype Testing:

Test No.	Test Load	Method
1 Stacking	Internal Load: 1.8R-T Testing Load: 6,750 kg/post	Hydraulic cylinder load to corner post through top corner fittings. Time duration: 5 mins.



2 Lifting from Top Corner Fittings	Internal Load: 2R-T	Lifting vertically from top corner fittings. Time duration: 5 mins.
3 Lifting from Bottom Corner Fittings	Internal Load: 2R-T	Lifting from bottom corner fitting 30 degrees for Time duration: 5 mins.
4 Restraint (Longitudinal)	Testing Load: R/side Internal Load: R-T	Hydraulic cylinder load applied to bottom side rails in compression & then tension. Time duration: 5 mins.
5 Roof Strength	Test Load: 300 kgf	Applied area will be the weakest place of 600 x 300 mm longitudinal & transverse. Time duration: 5 mins.
6 Rigidity (Transverse)	Test Force: 7,620 kgf (75 kn)	Hydraulic cylinder will be applied to front top end rail & door header through top corner fittings, each time pulling & pushing. Time duration: 5 mins.
7 Rigidity (Longitudinal)	Test Force: 3,810 kgf (37.5 kn)	Hydraulic cylinder load will applied to top side rail through top corner fittings. Time duration: 5 mins.

Note: (R) Maximum gross weight; (T) Tare weight; (P) Maximum payload.

9.4. INSPECTION

9.4.1. MATERIALS AND COMPONENT PARTS INSPECTION

All the materials and components will be inspected by Quality Control Dept. to make sure that the most suitable and qualified components are being used for the containers and to meet specification.

9.4.2. PRODUCTION LINE INSPECTION

Every container will be manufactured under effective Quality Control procedures, and every production line of the factory will be inspected and controlled by the Quality Control Dept. to meet this specification.

10. GUARANTEE

The guarantee period will commence at the day of delivery after the container shall be accepted by the owner in the factory.



10.1. PAINT GUARANTEE

The paint system applied to the container surface shall be guaranteed against corrosion and / or paint failure for a period of five (5) years. The guarantee shall be applied to all the kinds of faults / failures affecting more than 10% of any given part of the container and partial or total repainting shall be assured for the container(s) at the manufacturer's expense. Normal wear / tear, or corrosion caused by acid, alkaline solution or result from damages by abrasion impact or accident are excluded. Corrosion is defined as the rusting exceeding RE3 (European scale of degree of rusting).

10.2. OTHER GUARANTEE

All containers shall be guaranteed against any defects or omissions in construction, poor workmanship, or defective materials for a period of one (1) year. Any damages caused by mis-handling, mis-securing, mis-loading, impact and other natures of accident are excluded. The self-adhesive film decal shall be guaranteed seven (7) years.

11. MATERIALS

11.1. The main materials used in construction are as follows or approved equivalent.

Description	Material Used
Cross member	CORTEN A (SPA-H)
Bottom side rail	CORTEN A (SPA-H) or Q345B
Front Bottom Rail	CORTEN A (SPA-H) or Q345B
Center rail	CORTEN A (SPA-H)
Floor support angle	CORTEN A (SPA-H)
Door gasket	"J-C" Type EPDM
Gasket retainer	Pressed angle Stainless steel
Rivet	Stainless Steel
Door header	CORTEN A (SPA-H)
Door sill	CORTEN A (SPA-H)
Door panel	CORTEN A (SPA-H)
Door panel frame	CORTEN A (SPA-H)
Door hinge	S25C, Electro zinc plated



Door hinge pin	Stainless steel, SUS304
Hinges Bushing	Synthetic nylon or bronze
Locking cam keeper	S20C, Electro zinc plated or to suit cam
Locking cam	S20C, H.D.G. or to suit cam
Locking rod	STKR41, H.D.G.
Shim	EPDM
Front End Corner Post	CORTEN A (SPA-H) or Q345B
Rear End Corner Post (outer)	CORTEN A (SPA-H) or Q345B
Rear End Corner Post (inner)	SS41
Corner fitting	SCW49
Lashing bar, lashing ring	SS41, Electro zinc plated
Side panel	CORTEN A (SPA-H)
Front End Wall	CORTEN A (SPA-H)
Top Side Rail	CORTEN A (SPA-H) or Q345B
Roof panel	CORTEN A (SPA-H)
Roof Reinforcement Plate	CORTEN A (SPA-H)
Floor screw	Electro zinc plated
Floor board	Marine grade plywood or fiber cement board

11.2. PROPERTY

Material	Y.P. (kgf/mm ²)	T.S. (kgf/mm ²)
SS41	25	41
S20C	25	42
SCW49	28	49
CORTEN A (SPA-H)	35	49
Q345B	34.5	49