INDEX

<u>Sec</u>	etion Tin	le	<u>Page</u>
1.	General		2
2.	Dimensions and Ratings		. 4
3.	Materials		. 5
4.	Construction		. 6
5.	Surface preservation		11
6.	Markings		12
7.	Testing		12
8.	Guarantee		14

1. General

Operational environment

The container will be designed and constructed for carriage of general cargo by marine (on or below deck), road and rail throughout the world.

All materials used in the construction will be to withstand extremes of temperature range from- $40^{\circ}\text{C}(-40^{\circ}\text{F})$ to $+70^{\circ}\text{C}(+158^{\circ}\text{F})$ without effect on the strength of the basic structure and watertightness.

1.3 Standards and Regulations

The container will satisfy the following requirements and regulations in their latest editions, unless otherwise mentioned in this specification.

1.3.1 ISO Container Standards (1CC type)

Containers shall comply with following in their latest editions(including any amendments):

ISO 668 - Series 1 freight containers - Classification external dimensions and ratings

ISO 830 - Terminology in relation to freight container

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 6346 - Freight containers - coding, identification and marking

1.3.2 T.I.R. Certification

All the containers will be certified and complied with "The Customs Convention on the International Transport of Goods under the cover of T.I.R. Carnets." or "The Customs Convention on Containers."

1.3.3 C.S.C. Certification

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

1.3.4 T.C.T. Certification

All exposed wooden components used for container will be treated to comply with the requirements of "Cargo Containers-Quarantine Aspects and Procedures" of Australian Biosecurity Import Conditions (BICON former AQIS).

1.3.5 U.I.C. Registration

All the containers will be registered and complied with the "International Union of Railways."

1.3.6 Classification society

All the containers will be certified for design type and individually inspected by classification society, RS,RINA, BV, ABS, LR or CCS.

* Note: RS: Russian Maritime Register of Shipping(Russia)

BV: Bureau Veritas (France)

ABS : American Bureau of Shipping (USA)

LR: Lloyd's Register of Shipping (UK)

RINA: Registo Italiano Navad(Italy)

CCS: China Classification Society (P.R.C)

1.4 Handling

The container will be constructed to be capable of being handled without any permanent deformation under the following conditions:

a) Lifting, full, at top corner fittings vertically by means of top lift spreaders.

Lifting, empty, at top corner fittings vertically by means of top lift spreaders or top lift sling.

- b) Lifting, full or empty, at bottom corner fittings using slings with terminal fittings at any angles between vertical and 45 degrees to the horizontal.
- c) Lifting, full or empty, at forklift pockets using forklift truck.

2. Dimensions and Ratings

2.1 External Dimensions

Length 6,058 + 0mm
- 6mm
Width 2,438 + 0mm
- 5mm
Height 2,591 + 0mm
- 5mm

1) No part of the container will protrude beyond the external dimensions mentioned above.

2) Maximum allowable differences between two diagonals on anyone of the following surfaces will be as follows:

> Roof, bottom and side diagonals: 13 mm Front and rear diagonals: 10 mm

2.2 Internal Dimensions (nominal)

 Length
 5,898 mm

 Width
 2,352 mm

 Height
 2,393 mm

2.3 Door opening Dimensions (nominal)

Width 2,340 mm Height 2,280 mm

2.4 Internal cubic capacity (Nominal)

33.2cu.m 1,172 cu.ft

2.5 Forklift pockets

Width 360 mm Height min. 115 mm

Center to center 2,080 mm +20/- 80 mm

2.6 Ratings

Max. Gross Weight (R)	32,500 kgs	71,650 1bs
Tare Weight (design, (±2%)) (T)	2,180 kgs	4,810 1bs
Max. Payload (P)	30,320 kgs	66,840 1bs

3. Materials

3.1 General

The following materials will be used in the construction of containers:

3.2 Part specification

<u>Parts</u>	Materials by JIS
1) All steel except screws, rivets,	Anti-corrosive steel. SPA-H
bolts/nuts, door hardwares	or equivalent
and other shown on drawings	$Y.P.: 35 \text{ kg/mm}^2$
and specification	$T.S.: 49 \text{ kg/mm}^2$
2) Rear corner posts (inner)	Rolled high tensile steel. Q345
	$Y.P.: 35 \text{ kg/mm}^2$
	T.S.: 49 kg/mm ²
3) Door hinges	S25C
3) Door minges	Y.P.: 27 kg/mm ²
	T.S.: 45 kg/mm^2
	1.5 45 kg/mm
4) Door locking bars Str	uctural steel round pipe. STK400
	$Y.P.: 24 \text{ kg/mm}^2$
	$T.S.: 41 \text{ kg/mm}^2$
5) Corner fittings	Casted weldable steel. SCW480
	Y.P.: 28 kg/mm ²
	T.S.: 49 kg/mm ²
6) Locking gear cams and keepers	SS400
	$Y.P.: 25 \text{ kg/mm}^2$
	T.S.: 41 kg/mm ²
7) Door hinge pins	Stainless steel.
Gasket retainers	
8) Door gasket	EPDM
, G	
9) Floor board	Hardwood or bamboo/wood combination
	with PSF or OSB with PSF
10) Ventilator	ABS resin labyrinth type
10) ventuator	• • • •
	Page 6 of 19

* Note: Y.P. - Yielding Point

T.S. - Tensile Strength

4. Construction

4.1 General

4.1.1 The container will be constructed with steel frames, fully vertical-corrugated steel sides and front wall, horizontal-corrugated steel double doors at rear end, diestamped steel roof and corner fittings.

4.1.2 All welds of exterior including the base frames will be continuous welding using CO2 gas, but inner part of each bottom side rail will be fastened by staggered stitch welding. Map (drawing) of welded joints specifying typed of control: visual and measuring. Quality assessment of welded joints should be carried out in accordance with item 3.4.2, chapter XIV of Rules for the classification and construction of seagoing ships (Russian Register).

4.1.3 Interior welds - when needed - will be stitched with a minimum length of 15 mm.

4.1.4 Gaps between adjacent components to be welded will not exceed 3 mm or the thickness of the parts being welded.

4.1.5 Chloroprene or waterborne sealant is to be applied at periphery of floor surface and inside unwelded seams, butyl sealant is used to caulk at invisible seam of floor joint area and between door gasket and frame.

4.1.6 The internal bend radii of pressed sections of steel will be not less than 1.5 time the thickness of the materials being pressed.

4.1.7 The wooden floor will be fixed to the base frames by zinc plated self-tapping screws.

4.2 Protrusion

- 4.2.1 The plane formed by the lower faces of all transverse members shall be positioned by 12.5 mm +5/-1.5 mm above the plane formed by the lower faces of the bottom corner fittings, load transfer areas of the end and intermediate transverse members in base structures of containers meet the trequirements of the ISO 668:2013, Annex B, figure B1 and B3.
- 4.2.2 The top corner fittings are to protrude 6 mm above the highest point of the roof except corner plate.
- 4.2.3 The outside faces of the corner fittings will protrude from the outside faces of the corner posts by minimum 3 mm.
- 4.2.4 The outer side faces of the corner fittings will protrude from the outside faces of the side walls by nominal 7 mm and from the outside faces of the front end wall by 7.4 mm.
- 4.2.5 Under maximum payload, no part of the container will protrude below the plane formed by the lower faces of the bottom corner fittings at the time of maximum deflection.
- 4.2.6 Under 1.8 x maximum gross weight, no part of the container will protrude more than 6.0 mm below the plane formed by the lower faces of the bottom corner fittings at the time of maximum deflection.

4.3 Corner fittings

The corner fittings will be designed in accordance with ISO 1161 and manufactured at the works approved by classification society.

Corner fittings should have approval from RS, or should pass entrance control by RS and factory. (The amount of work strike KV - 21 joule at temperature: -40°C).

4.4 Base frame structure

Base frame will be composed of two bottom side rails, eighteen cross members, and a forklift pockets.

4.4.1 Bottom side rail

Each bottom side rail is built of a 155x52x30x28x4.5 mm thick cold formed double "Z" section steel made in one piece.

The lower flange of the bottom side rail is outward so as to facilitate easy removal of the cross members during repair and of less susceptible corrosion.

Reinforcement plates to be made of 4.5 mm thick flat steel is welded to bottom corner fitting.

4.4.2 Cross member

The cross members are made of pressed channel section steel with a dimension of 45x122x45x4.5 mm for the normal areas and 75x122x45x4.5 mm for the floor butt joints. The large one is reinforced by three 4.0 mm thick gussets.

The cross members are placed fully to withstand floor strength and welded to each bottom side rail.

4.4.3 Forklift pockets

Each forklift pocket is built of **4.0** mm thick full depth flat steel top plate and two 200 mm deep x 6.0 mm thick flat lower end plates between two channel section cross members. A 4.0 mm thick stiffener plate will be welded to each opening of fork pocket.

The one set of forklift pockets is designed in accordance with ISO requirements.

4.5 Flooring

The floor will consist of six pieces plywood boards, floor center rail, and self-tapping screws.

4.5.1 Floor

The wooden floor to be constructed with 28 mm thick hardwood plywood boards are laid longitudinally on the transverse members between the 4.0 mm thick flat bar floor center rail to the bottom side rails.

The floor boards are tightly secured to each transverse member by self-tapping screws, and all butt joint areas and peripheries of the floor boards are caulked with sealant.

- Wood species: Hardwood or bamboo/wood combination
 with PSF or OSB with PSF.
- 2) Glue: Phenol-formaldehyde resin.
- 3) Treatment:
- a) Preservative: Meganium or Equivalent.

In accordance with Australian Biosecurity Import Conditions(BICON former AQIS).

b) Average moisture content will be 12% before installation.

4.5.2 Self-tapping screw

Each floor board is fixed to the transverse members by zinc plated self-tapping screws that are 8.0 mm dia. shank x 16 mm dia. head x 45 mm length, and fastened by five screws per cross member but six screws at joint areas.

Screw heads are to be countersunk with about 2 mm below the floor top surface.

4.6 Rear frame structure

The rear frame will be composed of one door sill, two corner posts, one door header and four corner fittings, which will be welded together to make the door-way.

4.6.1 Door sill

The door sill to be made of a 4.5 mm thick pressed open section steel is reinforced by four internal gussets at the back of each locking cam keeper location.

The upper face of the door sill has a 10 mm slope for better drainage.

There is cut out at each end of the door sill and reinforced by a 200x75x9.0 mm channel steel as a protection against handling equipment damages.

4.6.2 Rear corner post

Each rear corner post of hollow section is fabricated with **6.0** mm thick pressed steel outer part and 40x113x12 mm thick hot rolled channel section steel inner part, which are welded continuously together to ensure a maximum width of the door opening and to give a sufficient strength against stacking and racking forces.

Four (4) sets of hinge pin lugs are welded to each rear corner post.

4.6.3 Door header

The door header is constructed with a 4.0 mm thick pressed "U" section steel lower part having four internal gussets at the back of each locking cam keeper location and a 3.0 mm thick pressed steel upper part, which are formed into box section by continuous welding.

4.7 Door

- 4.7.1 Each container will have double wing doors at rear end frame, and each door will be capable of swinging approximately 270 degrees.
- 4.7.2 Each door is constructed with two 3.0 mm thick pressed channel section steel horizontal frames for the top and bottom, one 100x50x3.2 mm thick rectangular hollow section vertical frames for the post side of door and one 100x50x4.0 mm thick rectangular hollow section vertical frames for the center side of door, 2.0 mm thick horizontally corrugated steel door panel, which are continuously welded within frames.
- 4.7.3 Two sets of galvanized "SL-F/5" or equivalent type bolt on model locking assemblies with forged steel handles are fitted to left door only using zinc plated steel bolts.

Two sets of galvanized "SL-F/5" or equivalent type bolt on model locking assemblies with forged steel handles are fitted to right door using twenty Huck bolts and four zinc plated steel bolts.

Locking bar retainers are fitted with nylon bushings at the top, bottom and intermediate bracket.

Locking gears should be assembled after painting of container.

The shims are to be provided between locking brackets and door panel.

- 4.7.4 The left hand door can not be opened without opening the right hand door when the container is sealed in accordance with TIR requirements.
- 4.7.5 The door hold-back of nylon rope is provided to the center locking bar on each door and a hook of steel bar is welded to each bottom side rail.
- 4.7.6 Each door is suspended by four reinforced hinges being provided with stainless steel pins, self-lubricating nylon bushings and the stainless steel washers, which are placed at the hinge lugs of the rear corner posts.
- 4.7.7 The door gasket to be made of an extruded J&C-type EPDM rubber is installed to the door peripheral frames with stainless steel gasket retainers which must be caulked with butyl sealant before installation of gasket, and fastened by stainless steel rivets at a pitch of 150 mm. The door gasket middle upper corner overlap to left door area with wider out lip.

4.8 Roof structure

The roof will be constructed with five five-corrugated (die-stamped) steel panels and four corner protection plates.

4.8.1 Roof panel

The roof panel is constructed with 2.0 mm thick die-stamped steel sheets having about 5.0 mm upward smooth camber, which are welded together to form one panel and continuously welded to the top side rails and top end rails. All overlapped joints of inside unwelded seams are caulked with chloroprene sealant or waterborne sealant.

4.8.2 Protection plate

Each corner of the roof in the vicinity of top corner fitting is reinforced by 4.0 mm thick rectangular steel plate to prevent the damage caused by the mishandling of lifting equipment.

4.9 Top side rail

Each top side rail is made of a 60x60x3.0 mm thick square hollow section steel.

4.10 Side wall

The trapezium section side wall is constructed with 2.0 mm thick fully vertically continuous-corrugated steel outer panels near the each post and 2.0 mm thick intermediate inner panels, which are butt welded together to form one panel and continuously welded to the side rails and corner posts.

All overlapped joints of inside are caulked with chloroprene sealant or waterborne sealant.

4.11 Front structure

Front end structure will be composed of one bottom end rail, two corner posts, one top end rail, four corner fittings and an end wall, which are welded together.

4.11.1 Bottom end rail

The bottom end rail to be made of a 4.0 mm thick pressed open section steel is reinforced by four internal gussets.

There is cut out at each end of the bottom end rail and reinforced by a 200x75 mm channel steel as a protection against handling equipment damages.

4.11.2 Front corner post

Each corner post is made of 6.0 mm thick pressed open section steel in a single piece, and designed to give a sufficient strength against stacking and racking forces.

The front floor support is made of POLYPROPYLENE (OPITION).

4.11.3 Top end rail

The top end rail is constructed with 60x60x3.0 mm thick square hollow section steel at lower part and 3.0 mm thick flat steel plate at upper part.

4.11.4 Front wall

The trapezium section front wall is constructed with 2.0 mm thick vertically corrugated steel panels, butt welded together to form one panel, and continuously welded to front end rails and corner posts.

All overlapped joints of inside are caulked with chloroprene sealant or waterborne sealant.

4.12 Special feature

4.12.1 Customs seal provisions

Customs seal and padlock provisions are made on each locking handle retainer to cover the sealed area in accordance with TIR requirements.

4.12.2 Lashing fittings

Five (5) lashing hoop rings are welded to each top and bottom side rail at recessed corrugations of side panels but not extruded any cargo space (total 20 rings).

Each lashing point is designed to provide a "1,500 kgs pull load in any direction" without any permanent deformation of lashing ring and surrounding area.

Three (3) lashing rods are welded to each corner post at the position of 200 mm higher from the top surface of bottom corner fitting and 200 mm lower from the bottom surface of top corner fitting and middle of the corner post.

Each lashing rod on the corner post is designed to provide a "1,000 kgs pull load in any direction" without any permanent deformation.

4.12.3 Shoring slot

A shoring slot, having a size about 60 mm width x 40 mm depth is provided on each rear corner post so that 2 1/4" thick battens can be arranged to be able to prevent doors from damage due to shifting cargo.

4.12.4 Ventilator

Each container will have two labyrinth type small plastic ventilators.

Each ventilator is fixed to the right upper part of each side wall by three 5.0 mm dia. Aluminum rivets in accordance with TIR requirements after drying of top coating, and caulked with sealant around the entire periphery except underside to prevent the leakage of water.

5. Surface preservation

5.1 Surface preparation

1) All steel surfaces - prior to forming or after - will be fully abrasive shot blasted conforming to Swedish Standard SA 2 1/2 to remove all rust, dirt, mill scale and all other foreign materials.

The shot blasted surface profile shall be have a maximum peak to valley height not exceeding 50 microns and average peak to valley height of about 25 microns.

- 2) All door hardwires will be hot-dipping zinc galvanized with approximately 75 microns thickness.
- 3) All fasteners such as self-tapping screws and bolts, nuts, hinges, cam keepers and lashing fittings will be electro-galvanized with approximately 13 microns thickness.

5.2 Coating

5.2.1 Prior to assembly

All steel surfaces will be coated with 10 microns thick two-pack polyamide cured zinc rich epoxy primer immediately after shot blasting, and then dried up in drying room.

5.2.2 After assembly

All weldments will be shot blasted to remove all welding fluxes, splatters, burnt primer coatings caused by welding heat, and other foreign materials.

Then all blasted weldments will be coated with zinc rich epoxy primer.

5.2.3 The total dry film will be (microns):

All surface of the assembled container will be have coating system as follows:

<u>Where</u>	Paint name	DFT (u)
Exterior surface	Solvent based Epoxy zinc rich prime	r 10
	Waterborne Epoxy zinc rich primer	20
	Waterborne Epoxy primer	40
	Waterborne Acrylic topcoat	40
	Color:RAL5017	
		Total: 110
Interior surface	Solvent based Epoxy zinc rich prime	r 10
	Waterborne Epoxy zinc rich primer	20
	Waterborne Epoxy topcoat	40
	Color:RAL7046	
		Total: 70
Under structure	Solvent based Epoxy zinc rich prime	r 10
	Waterborne Epoxy zinc rich primer	20
	Waterborne undercoating	190(steel parts)
		100(floorboard)
	Tota	al: 220(steel parts)

6. Marking

6.1 Arrangements

The containers will be marked in accordance with ISO, TCT, UIC, CSC and TIR requirements, owner's marking specifications and other required regulations.

6.2 Materials

- 1) Decal: Self-adhesive, high tensile PVC film for seven (7) years guarantee without peeling off, tenting or color fading.
- 2) Certification plate: Stainless steel plates to be chemically etched by acid.

6.3 Specifications

- 1) Identification plates such as consolidated data plate consisting of CSC, TIR and TCT will be riveted on the door permanently by stainless steel rivets. The entire periphery except underside will be caulked with sealant.
- 2) The owner's serial numbers and manufacturer's serial numbers will be stamped on top face of the bottom rear corner fitting.

7. Testing

7.1 Prototype testing

The prototype container manufactured in accordance with this specification will be tested by manufacturer under the supervision of classification society.

Test items & loads	Test methods
--------------------	--------------

A) Stacking Hydraulic cylinder load will be applied to Internal load: 1.8R-T each corner post through top corner fittings.

Test load: 97,200kg/post. Offset: 25.4 mm lateral

38.0 mm longitudinal

Time duration: 5 minutes

B) Lifting (from top corner fitting) Lifting vertically.

Internal load: 2R-T Time duration: 5 minutes

C) Lifting (from bottom corner Lifting 45 deg. to the horizontal.

fittings) Time duration: 5 minutes

Internal load: 2R-T

D) Lifting (for forklift pockets) Lifting by horizontal bars.

Internal load: 1.6R-T Bar length: 1,828 mm
Bar width: 200 mm

Time duration: 5 minutes

E) Restraint (longitudinal) Hydraulic cylinder load will be applied

Internal load: R-T to the bottom side rails.

Test load: 2R Two times for pulling and pushing.

Time duration: 5 minutes

F) Floor strength. Use of a special truck.

Page 16 of 19

Test load: 7,260 kgs Total contact area: 284 cm²

(16,000 lbs) Wheel width: 180 mm Wheel center: 760 mm

G) Wall strength (front) Compressed air bag will be used.

Test load: 0.4(R-T)=0.4P Time duration: 5 minutes

H) Wall strength (side) Compressed air bag will be used on

Test load: 0.6(R-T)=0.6P one side only.

Time duration: 5 minute

I) Wall strength (door) Same as front wall strength test.

Test load: 0.4(R-T)=0.4P

J) Roof strength (weakest part)

Applied area will be 600x300 mm

Test load: 300 kgs longitudinal and transverse.

K) Racking (transverse) Hydraulic cylinder load will be applied to the

Test load: 15,240 kgs header rail through top corner fittings.

150KN Two times for pulling and pushing.

Time duration: 5 minutes

L) Racking (longitudinal) Hydraulic cylinder load will be applied

Test load: 7,620 kgs to the top side rail through top corner

75KN fitting on one side only.

Two times for pulling and pushing.

Time duration : 5 minutes

M) Lashing Ring

Test methods - pull load in any direction

Test load :1,500x1.5=2,250 kgs

Lashing Bar

Test load:1,000x1.5=1,500 kgs

N) Operation of door After completion of test, the operation of

doors, locks, hinges, etc. will be checked.

O) Dimensions and weight After completion of test, the dimensions

and weight will be checked.

P) Weatherproofness Inside dia. of nozzle: 12.5mm

Distance: 1.5 m

Speed: 100 mm/sec Pressure: 1 kg/cm²

* Note: R - Maximum Gross Weight

T - Tare Weight

P - Maximum Payload

8. Guarantee

8.1 Structure

All the containers shall be guaranteed by manufacturer to be free from defects in materials, workmanship and structure for a period of one (1) year from the date of acceptance of the container by the buyer.

8.2 Painting

- 8.2.1 The paint system coated on the container surface shall be guaranteed to be free from corrosion and failure for a period of five (5) years from the date of acceptance of the container by the buyer.
- 8.2.2 Corrosion is defined as rusting which exceeds RE3 (European Scale of degree of Rusting) on at least ten (10) percent of the total container surface, excluding that resulting from impact or abrasion damage, contact with solvents or corrosive chemicals and abnormal use.

As the result of the inspection, if it is mutually agreed and accepted that the corrosion has been caused by the defective paint quality and/or poor workmanship, and/or paint manufacturer shall correct the defect on their accounts.

8.3 Decals

Decals applied on the container shall be guaranteed for a period of seven (7) years without peeling off, tenting or color fading if decals are supplied by



