



TECHNICAL SPECIFICATION
FOR
STEEL DRY CARGO CONTAINER
2438 x 2200 x 2260 mm (8-FT)

MODEL NO. : MAG03-802

SPEC. NO. : MAG03-802-S

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OWNER : MAGELLAN

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1. General

1.1 Scope

This specification will cover the design, construction, materials, performances of 2438 x 2200 x 2260 type both end doors steel dry cargo containers.

These containers specified herein will be manufactured at **Containers Co., Ltd.** (hereinafter referred to) under strict quality control by and be approved by the classification society or agency.

1.2 Handling

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

- a) Lifting, full or empty, at top corner fittings using slings with terminal fittings at any angles between vertical and 60 degrees to the horizontal.
- b) Lifting, full or empty, at bottom corner fittings using slings with terminal fittings at any angles between vertical and 60 degrees to the horizontal.
- c) Lifting, full or empty, at forklift pockets using forklift truck.

2. Dimensions and Ratings

2.1 External Dimensions

Length	2,438	+ 0mm	- 5mm
Width	2,200	+ 0mm	- 5mm
Height	2,260	+ 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, side, front and rear diagonals: 10mm

2.2 Internal Dimensions

Length	2,278	+ 0mm	- 5mm
Width	2,112	+ 0mm	- 5mm
Height	2,060.5	+ 0mm	- 5mm

2.3 Door opening dimensions

Width	2,100	+ 0mm	- 5mm
Height	1,949.5	+ 0mm	- 5mm

2.4 Internal cubic capacity (Nominal)

9.913 cu.m 350 cu.ft

2.5 Forklift pockets

Width	320 mm
Height min.	115 mm
Centre to centre	920 mm +/- 50 mm

2.6 Ratings

Max. Gross Weight (R)	6,000 kg	13,230 lb
Tare Weight (design) (T)	950 kg	2,100 lb
Max. Payload (P)	5,050 kg	11,130 lb

Tare Weight Tolerance **2%**

3. Materials

3.1 General

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

3.2 Part specification

	<u>Parts</u>	<u>Materials by JIS</u>
1)	Roof panels Door panels Side panels Door sill Cross members Bottom side rails Door header (upper & lower) Top side rails Door horizontal frames Door vertical frames Corner posts (inner & outer) Upper and lower plates of forklift pockets	Anti-Corrosive Steel: CORTEN A, SPA-H, B480 or equivalent Y.P. : 35 kg/sq.mm T.S. : 49 kg/sq.mm
2)	Door locking bars	Structural steel round pipe. STK41 Y.P. : 24 kg/sq.mm T.S. : 41 kg/sq.mm
3)	Corner Fitting	Casted weldable steel. SCW480 Y.P. : 28 kg/sq.mm T.S. : 49 kg/sq.mm
4)	Locking gear cams and keepers	Forged weldable steel. S20C Y.P. : 23 kg/sq.mm T.S. : 44 kg/sq.mm
5)	Door hinge pins Door gasket retainer	Stainless steel. SUS304
6)	Door gasket	EPDM
7)	Flat steel board	
8)	Ventilator	ABS resin labyrinth type

* 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 , front panels horizontal-corrugated steel double doors at rear end, flat steel roof and corner fittings.
- 4.1.2 All welds of exterior including the base frames will be continuous welding using CO₂ gas shielding procedure, but inner part of each bottom side rail will be fastened by staggered stitch welding.
- 4.1.3 Interior welds - when needed - will be stitched with a minimum bead length of 15mm.
- 4.1.4 Gaps between adjacent components to be welded will not exceed 3mm or the half thickness of the parts being welded.

4.2 Protrusion

- 4.2.1 The plane formed by the lower faces of the bottom side rails and all transverse members shall be positioned by 12.5mm +5/-1.5mm above the plane formed by the lower faces of the bottom corner fittings.
- 4.2.2 The top corner fittings are to protrude a minimum of 6mm above the highest point of the roof.
- 4.2.3 The outside faces of the corner fittings will protrude from the outside faces of the corner posts by minimum 4mm for side structure.
- 4.2.4 The outside faces of the corner fittings will protrude from side wall by nominal 8mm.
- 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 6.0mm 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 (Amd. 1990) and manufactured at the works approved by classification society.

4.4 Base frame structure

Base frame will be composed of two (2) bottom side rails, a set of forklift pockets and totally seven (7) cross members.

4.4.1 Bottom side rail

Each bottom side rail is built of 70x150.5x30x4.0mm cold-formed channel 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 4.0mm thick, flat steel plates. The plates are welded to bottom corner fitting.

4.4.2 Forklift pockets

Each forklift pocket is built of 3.0mm 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 with a dimension of 45x145.5x45x3.0mm.

4.4.3 Cross member

The cross members are made of pressed channel section steel with a dimension of 45x122x45x3.0mm for the normal areas for the floor butt joints. The cross members are placed fully to withstand floor strength and welded to each bottom side rail.

4.5 Flooring

The floor will consist of two pieces of t3.0 flat steel plates.

4.6 Door end frame structure

The door end 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 4.0mm thick pressed open section steel is reinforced by four internal gussets of a 4.0mm thick.

4.6.2 Rear corner post

Each rear corner post of hollow section is fabricated with 4.5mm thick pressed steel outer part and 41.5x121x4.0mm thick pressed 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.

Three (3) sets of hinge pin lugs are welded to each rear corner post.

4.6.3 Door header

The door header is constructed with a 4.0mm thick pressed "U" section steel lower part having four internal gussets and a 3.0mm 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 end frame, and each door will be capable of swinging approximately 270 degrees.

4.7.2 Each door is constructed with two 3.0mm thick pressed channel section steel horizontal frames for the top and bottom, 100x50x2.3mm thick rectangular hollow section vertical frames for the post side and centre side of door respectively, 1.6mm thick horizontally corrugated steel door panel, which are continuously welded within frames.

4.7.3 Two sets of galvanized locking assemblies which one is the same model with "BE2566M" steel handles are fitted to each door wing using high tensile zinc plated steel bolts according to TIR requirements. Locking bar retainers are fitted with nylon bushings at the top, bottom and intermediate bracket. Locking gears should be assembled after painting and not to be painted.

- 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 centre 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 three hinges being provided with stainless steel pins, self-lubricating nylon bushings and brass washers, which are placed at the hinge lugs of the rear corner posts.
- 4.7.7 The door gasket to be made of extruded triple lip type (J-C type - vertical and upper are “J”, lower is “C”) EPDM rubber that is installed to the door peripheral frames with stainless steel gasket retainers. It must be caulked with butyl sealant and fastened by stainless steel blind rivets at a pitch of 150mm.

4.8 Roof structure

The roof will be constructed with flat steel panels and four corner protection plates.

4.8.1 Roof panel

The roof will be constructed with 1.6mm thick flat steel plates reinforced by 3mm thick ‘hat’ shape section channels and four (4) roof corner gussets.,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.

4.8.2 Protection plate

Each corner of the roof in the vicinity of top corner fitting is reinforced by 3.0mm thick rectangular steel plate to prevent the damage caused by mishandling of lifting equipment.

4.9 Top side rail

Each top side rail is made of a 60x60x2.3mm thick square hollow section steel.

4.10 Side wall

The trapezium section side wall is constructed with 1.6mm thick fully vertically continuous-corrugated steel 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.

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 3.0mm thick pressed open section steel is reinforced by three internal gussets.

4.11.2 Front corner post

Each corner post is made of 4.0mm thick pressed open section steel in a single piece, and designed to give a sufficient strength against stacking and racking forces.

4.11.3 Top end rail

The top end rail is constructed with 60x60x2.3mm thick square hollow section steel at lower part and 3.0mm thick pressed steel at upper part.

4.11.4 Front wall

The trapezium section front wall is constructed with 1.6mm 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.

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

Two (2) lashing rods are welded to each rear corner post at the position of 150mm higher from the floor and 200mm lower from the bottom surface of top corner fittings. Each lashing rod on the corner post is designed to provide a "1,500 kgs pull load in any direction" without any permanent deformation.

Two (2) lashing rods are welded to each front corner post at the position of 150mm higher from the floor and 200mm lower from the bottom surface of top corner fittings. Each lashing rod on the corner post is designed to provide a "1,500 kgs pull load in any direction" without any permanent deformation.

4.12.3 Ventilator

Each container will have two small plastic ventilators of labyrinth type.

Each ventilator is fixed to the right-hand upper part of each side wall by three 5.0mm dia. steel huck bolts in accordance with TIR requirements after drying of top coating, and caulked with sealant around the entire periphery except bottom 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 SA21/2 with near white metal surface, and anchor profiles of 25 to 30 microns to remove all rust, dirt, mill scale and all other foreign materials.
- 2) All door hardware will be hot-dipping zinc galvanized with approximately 75 microns thickness.
- 3) All fasteners such as self-tapping screws, hinges, cam keepers and lashing fittings will be electro-galvanized with approximately 13 microns thickness.

5.2 Primer coating

5.2.1 Prior to assembly

All steel surfaces will be coated with 10-15 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

- 1) All weldments will be shot blasted to remove all welding fluxes, spatters, burnt primer coatings caused by welding heat, and other foreign materials.
Then all blasted weldments will be coated with zinc rich epoxy primer.
- 2) Exterior of assembled container will be coated again 15-20microns with zinc rich primer and again 40 microns epoxy primer prior to top coating.
- 3) Interior and base of assembled container will be coated again 15-20 microns with zinc rich primer.

5.3 Top coating

- 1) After drying of primer, exterior of container will be coated again with high build Acrylic paint and interior will be coated again with polyamide cured epoxy resin based high build coating.
- 2) The dry film thickness of top coating will be 40 microns for the exterior and 45 microns for the interior.

5.4 Under coating

After completion of flooring, all the understructures and floor will be coated with minimum 200 microns dry film thickness underseal coating.

5.5 The total dry film will be (**Microns**):

	EXT.	INT.	BASE
Zinc rich primer	30	30	30
Epoxy primer	40		
Epoxy high build coating		45	
Acrylic acid	40		
Underseal			200
Total (Min.)	110	75	230
Roof	120		

6. Marking

6.1 Arrangement

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

6.2 Materials

1) Decal : - Self-adhesive, cast vinyl film, for seven (7) years guarantee without peeling off, tenting or colour fading.

2) Certification plate:
18-8 type stainless steel plates to be chemically etched by acid and treated by enamel.

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 blind rivets. The entire periphery except the bottom side will be caulked with sealant.

2) The owner's serial numbers and manufacturer's serial numbers will be stamped into the top surface of left-hand and right-hand rear lower corner fittings respectively.