10’ REEFER COLD STORAGE
TECHNICAL SPEC. BULLBOX

STEEL DRY CARGO CONTAINER
BULLBOX 10’ x 8’ x 8’6

MODELO NO: **BULLBOX 10’ REEFER COLD STORAGE**
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SECCIÓN/TÍTULO/PÁGINA

1.1 General

The container is to be designed and manufactured for the carriage of refrigerated (frozen, chilled) foodstuffs and general cargo by land (on road or rail) and by sea (above or bellow deck) throughout the world and will range from -30°C to +70°C without effect on the strength of basic structure. A mechanical refrigeration unit of a "one piece picture frame type" will be fitted to the front end frame.

The container is designed with a refrigeration unit to maintain the inside space temperature at -25C° to +25C°
These containers specified herein will be manufactured by Contenedores y Embalajes Normalizados, S.A (hereinafter referred to BULLBOX) under strict quality control by BULLBOX and be **approved by the classification society** (Bureau Veritas, China Clasification Society, Lloyd's Register of Shipping, American Bureau of Shipping...)

668 Dimensions and ratings
(1993 edition) 6346 Coding, identification and marking (the third edition 1995)
1496/2 Specification and testing thermal containers (1996 edition)
1161 Specification of corner fittings (1990 edition/ Cor.1.: 1990)
1.2.2 TIR Requirements and Certificate: approved By Classification Society.
1.2.3 Timber Component Treatment and Certificate There will be no exposed timber in the construction.
1.2.4 CSC Requirements and Certificate In compliance with "international convention for safe containers".
1.2.5 Classification Society All Containers will be certified by ABS / BV / LR

1.2 Handling and transportation

The containers will be constructed to be capable of being handled without permanent deformation which will render them unsuitable for use under the following conditions:

a) Lifting full or empty at top corner fittings by means of spreaders fitted with hooks, shackles or twistlocks.
b) Lifting full or empty at bottom corner fittings using slings with terminal fittings at sling angles of 60 deg. To the horizontal plane.

The containers will be constructed to be capable of being handled without permanent deformation which will render them unsuitable for use under the following conditions:

a) Marine: in the cell guide Six (6) high stacked (on a level 10,160kgs).

b) Road: On flat bed or skeleton chassis, secured by twist-locks or equivalent ones at the bottom corner fittings.

c) Rail:. On the flat cars of special container cars secured by twistlock or equivalent ones at the bottom corner fittings.

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2. Dimensions and Ratings

External (mm)

Length	2,991 + 0 mm
	-6 mm
Width	2,438 + 0 mm
	-5 mm
Height	2,591 + 0 mm
	-5 mm

Internal

Length	2,383 mm
Width	2,292 mm
Height	2,275 mm

Door opening dimensions

Width	2,288 mm
Height	2,251 mm
Cargo Access height	2,211 mm

Internal cubic capacity (nominal)

15.5 m3	440 cu.ft

Floklift pocket dimensions

Center Distance	900 mm
Width	360 mm
Height	116 mm

Ratings

Max. Gross Weight (R)	12,000 kgs
Tare Weight (design) (T)	2,180 kgs
Max. Payload (P)	9,821 kgs

Insulation

Item	Thickness	Density
Roof	80 mm	40-45kg/cu.m
Side walls	61 mm	45-50kg/cu.m
Door panels	76 mm	50-55kg/cu.m
Floor	77/129.9mm	55-60kg/cu.m
Corner		40kg/cu.m

Heat leakage value

Umax = 16 kcal / deg.c.hr. at the mean wall temperature 293K (20 ℃) (including reefer unit.)

The final K value will according to the test result done in factory and certified by an authorized classification society.

Max. air leakage value

Qmax = 5 m3 /hr. (incl. reefer unit max. 0.5m3 /h) measured at 250±10Pa.

The final air leakage value will according to the test result done in factory and certified by an authorized classification society.

3.1 Materials of main parts

1) **Door Pannel** **Front top rail** **Front corner post & inner** **Door sill outer** **Door sill inner** **Rear header & inner** **Rear corner post & inner** **Top side rail** **Bottom side rail** **Forklift pocket** **Forklift pocket reinforcement** **Side post** **Roof bow** **Sub floor (bottom sheet)**	CORTEN A
2) **Side panel** **Clip on device angle** **Door panel**	M.G.S.S..
3) **Door lining** **Side lining** **Generator fitting nut**	STAINLESS STEEL
4) **Corner fitting**	SCW480
5) **Lining front-side** **Lining front roof** **Lining door-side** **Lining rear roof** **Roof lining**	AL
6) **Floor rail**	6061-T6
7) **Door hinge**	6061-T6
8) **Door lock**	Forged steel
9) Insulation tape	Electrolytic buffer of P.E.or P.V.C.
10) Foam tape	Adhesive of P.V.C.

11) Insulation foam	1) Rigid polyurethane foam 2)Blowing agent: R141b (HCFC)
12) Exposed seale	Grey
13) Hidden sealer	Butyl

3.2 Properties of material

Material	**Y.P.(kg/mm2)**	**T.S.(kg/mm2)**
CORTEN A	35	49
M.G.S.S.(t >2mm)	32	45
M.G.S.S.(t≤2mm)	25	36
STAINLESS STEEL	21	53
SCW480	28	49
ALUMINUM	16	22
6061-T6	25	27
Forged steel	23	45

4. Construction

4.1 General construction

The container will be constructed of steel parts, which are rear and front frame, insulated side with corrugated M.G.S.S. side panel and stainless steel lining, insulated base with aluminum “T” section floor rail and CORTEN A corrugated sub floor, insulated roof with M.G.S.S., corrugated panel and aluminum lining, insulated door with M.G.S.S. door panel and stainless steel corrugated lining, and ISO corner fittings. Refrigeration unit will be installed to the front end frame.

4.2 Base structure & flooring

The floor is composed of corrugated sub floor and “T” section floor rail with insulation of polyurethane

Bottom side rail : 4.0mm thick upper rails with 4.0 angle reinforcement and 4.5mm thick lower rails.

Floor rail : 40mm high and 50mm spaced extruded aluminum “T” shape section. Rear end is reinforced by aluminum profile protector.

Floor lashing bar (Capacity equal to 1 ton) : Aluminum lashing bar (t8.0) is welded on the floor rail. QTY: 2/side

Forklift pocket : 6.0mm thick pressed hat section reinforced by 6.0mm thick bottom plate.

Subfloor: 1.6mm CORTEN A corrugated sheets continuously welded to bottom rail and forklift pocket.

Drain Pipe: 2 auto drains are provided at front and rear end corner (total 4).

Floor bow: Aluminum floor bows are tacked welding on back surface of T-floor.

Floor stringer: PE filter

T-floor protection plate: Heavy duty type aluminum extrusión.

4.3 Front Fame

Front frame is composed of corten steel frame members. which is constructed so that refrigerating unit can be fitted.

Front Corner Post Welded construction with 4.0mm thick outer and 4.0mm thick inner reinforcement.
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Front Sill: 4.0mm thick outer plate, 4.0mm thick inner member, and the lower flange of the sill near to corner fitting is provided with hot rolled C section for damage protection.

Front Header: 4.0mm thick pressed plate with 4.0mm thick protection plate.

Generation Mounting device It is provided on front header and corner posts for clip on type generator sets.

4.4 Rear and frame

Rear corner Post

Welded construction with 6.0mm thick outer and 6.0mm thick inner with 6.0mm thick reinforcement.

Door header

Welded construction with 4.0mm thick upper member, 4.0mm thick inner member and 4mm thick protection plate.

Door sill

Welded construction with 6.0mm thick outer member and 4.0mm thick inner member (CORTEN A). 4 pieces of 4.0mm thick steel plate will be applied at the behind of each cam keeper location. The lower flange of the sill near to corner fitting is provided with hot rolled C section for damage protection.

A curtain assembly will be fixed on the rear end near door. Ramp has a lip at the front where it meets the door sill.

4.5 Door

Rear door is composed of M.G.S.S. panel and corrugated stainless Steel inner lining with polyurethane insulation reinforced by 4 pieces of Z-beam.
One set of door hold-back of nylon rope is provided on each door and a rope hook is fitted on each bottom rail to retain the door from closing. A door keeper is installed which are designed to prevent left hand door from
opening before right hand door according to T.I.R. requirements.

Door panel

1.2mm thick muffler grade stainless steel (M.G.S.S.) sheet.

Lining

0.7mm thick die-stamped corrugated panel.

Hinge lug

6.0mm thick M.G.S.S. plate.

Hinge

8 pieces, A6061-T6
Each door is suspended by 4 hinges with nylon bushes and stainless steel
washers placed at the hinge lug of the rear corner post.

Hinge Pin

12.7mm diameter bar, JIS STAINLESS STEEL.Each hinge pin will be riveted to the hinge pin stopper.

Locking rod assembly

Locking rod ass'y: hot dip galvanized.

Installation

Locking rods and hinges installed with stainless steel bolts (AISI 304, T.S. min.70kg/sq.mm).
Bolts to be screwed into nuts that are welded and fastened to the interior panel surface.

Rubber gasket

Outer: E.P.D.M. "C" section double LIP.
Inner: E.P.D.M. "O" section.

4.6 Side

Top side rail

4.0mm thick cold rolled profile.

Panel

0.8mm (main) / 1.0mm (outer) thick die-stamped corrugated M.G.S.S. side panels butt-welded together to form one panel by automatic TIG welding.

Lining

0.7mm thick corrugated stainless steel panels butt-welded together to form one panel by automatic TIG welding.

Side Post

t1.6mm CORTEN A hat section posts spot welded to the outer panel and welded to the top and bottom rails.

4.7 Roof

Roof panel

0.8mm thick die-stamped corrugated M.G.S.S. roof panels butt-welded together to form one panel by automatic TIG welding.

Lining

0.8mm thick small corrugated aluminum panels tightly pressed together on joint to form one panel by occlusive technology.

Roof bow

t1.6mm CORTEN A hat section

4.8 Edge Corners

All inner edges are covered by aluminum, PVC sections, all sealed and riveted or glued to the inner lining.

4.9 Corner Fitting

JIS SCW 480 or equivalent quality, designed in accordance with ISO/1161

4.10 Unit Mounting

The unit mounting is designed in accordance with the reefer machinery manufacturer's mounting requirement.

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5. PRESERVATION

5.1 Surface preparation

Prior to assembly

1) All steel components, prior to foaming, will be shot blasted to Swedish standard Sa 2.5 to remove rust, mill scale etc

2) MGSS components, prior to painting, will be cleaned to all oil and dirt etc.

3) Locking rod ass'y which are welded with gear cams, bars, holders and handle hinges are hot dip galvanized (thickness: min.75 microns).

Polyurethane Contact Surfaces : Adhesive foambond will be applied to the polyurethane contacting surfaces for good adhesion with polyurethane.

After assembly

1) All M.G.S.S. parts will be cleaned to remove all oil rust, dirt and etc before sweep blasted
2) Surface treatment for painting will be done blasting on welding seam-line and all welding slags, and other foreign matters will be removed

5.2. Paint Surfaces

Steel parts

1)Exposed parts (MGSS only) shall be painted (air-less system)with:.

Outside surfaces:
- Primer: Polyamide epoxy primer -50 microns
- Top coat: Polyurethane (RAL 9010) - 60 microns
Total dry film thickness - 110 microns.

2) Exposed parts of steel (CORTEN A/equivalent) structure shall be painted, (air-less system) with:

-Shop primer: Zinc rich primer -10 microns .
-Primer: Zinc rich primer -20 microns.
-Primer: Polyamide epoxy primer -40 microns.
-Top coat: Polyurethane (RAL 9010) - 50 microns
Total dry film thickness -120 microns.

3)Under coating

-Primer: Zinc rich primer -30 microns.
-Top coat: Bitumen wax. - 200 microns.
-Total dry film thickness -230 microns.

All the wooden components used in the container construction are completely encapsulated with either metals or plastics and no exposed so that it meets the requirements of the Australian Commonwealth Department of Health.

6. Lettering

Lettering

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

Materials

The material of all decals is P.V.C. film with permanent adhesive and having a minimum 5 years life. The certification plates of timber treatment, CSC and TIR approval are of stainless steel and will be engraved in permanent manner and riveted with stainless steel rivets.

7. Prototype container

Prototype container

A prototype container will be built and testing will be done before main production. This prototype will be tested and certified by inspectors nominated by the owner.

Production line of container Every container is manufactured under effective quality control procedures to meet the specified standards. After completion all container dimensions will be checked and door operation checked.

7.2 Proposed criteria table for general prototype

item	*Test load & methods*
a)Stacking	Load: 22,860kg/post Offset: 38mm longitudinally 25mm laterally
b) Lifting by top **Corner fitting**	Internal load: 2.0R-T (60deg)
c) Lifting by bottom **corner fittings**	Internal load: 2.0R-T (60deg)
d) Fork pocket lifting .	Internal load: 1.25 R-T
e) Floor Strength	7,260kg (16,000LBS)
F) Restraint	R /side Internal load: R-T
g) End Wall Strength .	0.4P Uniform Load by Air Bag

h) Side Wall Strength	0.6P Uniform Load by Air Bag
i) Roof Strength	300kg (300×600mm)
j)Air-tightness Test Internal pressure	250±10Pa)

Thermal Test in compliance with ISO 1496/2 part 2: thermal container.
Performance Test of Thermal Appliances In compliance with ISO 1496/2..

10. Guarantee

Three (3) years and be based on standard RE 3 of the European degree of rusting standards. Normal wear/tear, or corrosion caused by fish oil, animal and vegetable oils, strong solvents, impact and accident is excluded.

The warranty shall be applied to all kinds of faults or failures affecting more than 10% of the painted surface and partial or total repainting shall be assured for the container(s) at manufacturer expense

Decal guarantee 5 years
Other guarantee All containers are guaranteed by the manufacturer, any defects or omissions in construction, poor workmanship, defective materials, for period of 1 year.

BULLBOX

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