

BULLBOX

45' HC TECHNICAL SPEC BULLBOX

STEEL DRY CARGO CONTAINER
ISO TYPE - 45' × 8' × 9'6"

MODELO NO: **BULLBOX 45' HC**
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BULLBOX

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 **1.1 General**

This specification will cover the design, construction, materials, testing and inspection performances of 45'x8'x 9'6" ISO type steel dry cargo containers.

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 Classification Society, Lloyd's Register of Shipping, American Bureau of Shipping...)

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 temperatura range from -30°C(-22°F) to +70°C(+158°F) without effect on the strength of the basic structure and watertightness.

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

ISO Container Standards : ISO 668. ISO 830. ISO 1161. ISO 1496-1. ISO 6346. ISO 1894

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."

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

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 the Commonwealth Department of Health, Australia.

All the containers will be certified for design type and individually inspected by classification society, CCS: China Classification Society (P.R.C).

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

* Note : BV : Bureau Veritas (France)
ABS : American Bureau of Shipping (USA)
LR : Lloyd's Register of Shipping (UK)
GL : Germanischer Lloyd (Germany)
CCS : China Classification Society (P.R.C)

 **1.2 Handling and Transportation**

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 vertically 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 any angles between vertical and 45 degrees to the horizontal.

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c) Lifting, full or empty, at forklift pockets using forklift truck.

The container will be constructed to be suitable for transportation in the following modes:

- a) Marine: In the ship cell guides of vessels: 30ton: seven (7) stacked. On the deck of vessel: secured by vertical and diagonal wirelashings:
 - 1) 40' location: Four (4) high stacked.
 - 2) 45' location supported at 40': Four (4) high stacked.
 - 3) 40' location supported at 45': Three (3) high stacked

b) Road: On 45' long flat bed or skeletal chassis, secured by twistlocks or equivalent at the bottom corner fittings.

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


2. Dimensions and Ratings
External

Length	13,716 + 0 mm	45' + 0
	-10 mm	- 3/8"
Width	2,438 + 0 mm	8" +0
	-5 mm	- 3/16"
Height	2,896 + 0 mm	9' 6" +0
	-5 mm	- 3/16"

Internal

Length	13,556 mm	44' 5 45/64"
Width	2,352 mm	7' 8 19/32"
Height	2,698 mm	8' 10 7/32"

Door opening dimensions

Width	2,340 mm	7' 8 1/8" + 0
		3/16"
Height	2,585 mm	8' 5 49/64" + 0
		- 3/16"

Internal cubic capacity


86.0 cu.m	3,040 cu.ft
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Gooseneck tunnel

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

Ratings

Max. Gross Weight	30,480 kgs	67,200 lbs
Tare Weight	4,700 kgs	10,360 lbs
Max. Payload	25,780 kgs	56,840 lbs


3. Materials

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


3.1 Parts specifications

Parts	Materials
1) All steel except screws, rivets, bolts/nuts, door hardware and other shown on drawings and specification	Anti-corrosive steel: CORTEN A, SPA-H or equivalent Y.P. : 35 kg/ mm ² T.S. : 49 kg/ mm ²
2) Rear corner post (inner)	Rolled high tensile Steel SM50 A Y.P. : 37 kg/mm ² T.S. : 50 kg/mm ²
3) Door locking bars	Structural Steel round pipe: STK400 (STK41) Y.P.: 24kg/mm ² T.S.: 41kg /mm ²
4) Corners fittings	Casted weldable Steel. SCW480 (SCW49) Y.P. : 28kg/mm ² T.S. : 49kg/mm ²
5) Locking gear cams and keepers	S20C Y.P. : 25kg/mm ² T.S. : 41kg/mm ²
6) Door hinges	S25C Y.P. : 27kg/mm ² T.S. : 45kg/mm ²
7) Door hinge pins gasket retainers	Stainless Steel. SUS304
8) Door gasket	EPDM

Y.P. – Yielding Point

T.S. – Tensile Strength

 **4.1 Construction**

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

The front and rear end are extended separately 2 1/2ft from nominal 40ft location. Eight corner fitting supported by hollow section post are at 40ft location. Eight corner fitting are at 45ft location.

All welds of exterior including the base frames will be continuous welding using CO2 gas.

Interior welds - when needed - will be stitched with a minimum length of 25 mm.

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

Chloroprene 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.

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

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

 **4.2 Protrusion**

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.

The top corner fittings are to protrude 6 mm above the highest point of the roof.

The outside faces of the corner fittings will protrude from the outside faces of the corner posts by minimum 3 mm.

The outside faces of the corner fittings will protrude from the outside faces of the sides 7 mm and front wall by 8 mm. 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.

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 (1984 edition) and manufactured at the works approved by classification society.

 **4.4 Base frame structure**

Base frame will be composed of two bottom side rails, 31 cross members, and a gooseneck tunnel.

Bottom side rail Each bottom side rail is built of a 48x162x30x4.5 mm thick cold formed channel section steel made in one piece.

The floor guide rails of 3.0 mm thick pressed angle section steel are provided to the bottom side rails by staggered stitch welding.

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 4.0 mm thick flat steel is welded to bottom corner fitting.

Cross member The cross members are made of pressed channel section steel with a dimension of 45x122x45x4.0 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.

Gooseneck tunnel The gooseneck tunnel consists of 4.5 mm thick one piece pressed hat section tunnel plate, twelve 4.5 mm thick pressed channel section bows, one 4.0 mm thick enclosed section tunnel rear bolster which is made of two pressed "C" section, and sixteen 4.0 mm thick tunnel outriggers. The gooseneck tunnel is designed in accordance with ISO. requirements.

4.5 Flooring

The floor will consist of fourteen pieces plywood boards, floor center rail, and selftapping screws. Floor The floor should be full imported from abroad and floor dimensions better use BULLBOX standard. The plywood boards will be coated 80 microns with polyurethane 200 FHB from CMP Shanghai.

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 and the 2.3 mm thick pressed angle section steel floor guide rails stitched welded 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.

- 1) Wood species: Apitong or Hardwood.
- 2) Glue: Phenol-formaldehyde resin.
- 3) Treatment:
 - a) Preservative: Meganium or Equivalent. In accordance with Australian Health Department Regulations.
 - b) Average moisture content will be 14% before installation.

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.

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 200x75 mm channel steel as a protection against handling equipment damages.


Each rear corner post of hollow section is fabricated with 4.5 mm thick pressed steel outer part and 40x113x12 mm thick hot rolled channel section steel inner part, which are welded continuously

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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.

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**

Each container will have double wing doors at rear end frame, and each door will be capable of swinging approximately 270 degrees.

Each door is constructed with two 3.0 mm thick pressed channel section steel horizontal frames for the top and bottom, 100x50x3.2 mm thick rectangular hollow section vertical frames for the post side and center side of door respectively, 2.0 mm thick horizontally corrugated steel door panel, which are continuously welded within frames.

Two sets of galvanized "HH 2566 E" full system made by Shanghai Haihang Company or approved type bolt on model locking assemblies (made in China) with forged handles are fitted to each door using zinc plated steel bolts and Huck 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 of container. The shims are to be provided between locking brackets and door panel (except under large bearing brackets)

The left hand door can not be opened without opening the right hand door when the container is sealed in accordance with TIR requirements.

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.

Each door is suspended by four 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. Door hinge blade: made of 92HH-B3-01S.

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 145 mm.

Supplier of door gasket should be nominated or approved by China Shipping under each order.

 **4.8 Roof structure**


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

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.

Protection plate Each corner of the roof in the vicinity of top corner fitting is reinforced by 3.0 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 1.6 mm thick fully vertically continuous-corrugated steel outer panels near the each post and 1.6 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.

 **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.

The bottom end rail to be made of a 4.0 mm thick "L" section steel lower part, 60x60x3.0 mm thick full width square hollow section upper part and two 3.0 mm thick flat steel plates for floor board support. There is cut out at each end of the bottom end rail and reinforced by 200x75x9.0 mm channel steel as a protection against handling equipment damages.

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

The trapezium section front wall is constructed with 1.0 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.

 **4.12 Dual Frame (rear and front)**

Intermediate posts are constructed with inner part of 6.0 mm thick steel plate and an outer part of 6.0 mm thick pressed channel section with 4.5 mm thick gusset. Continuously welded together to form a hollow section.

Intermediate top rail Intermediate top rail is constructed with hat section 4.5 mm thick pressed steel. Intermediate sill Intermediate sill is a welded box section to be constructed with 4.0 mm thick "U" shaped steel pressing upper and lower part. There is cut out at each end of the rail and is reinforced by a 200x75 mm channel steel, as protection against handling damages.

Intermediate side will be constructed with top side rail and side panels. Each top side rail is made of a 60x60x3.0 mm thick square hollow section steel. The side panels are constructed with 1.6 mm thick fully vertically corrugated into trapezium section.

Intermediate base Intermediate base will be constructed with bottom side rails, two outrigger (front) and one cross member (rear). Each bottom side rail is constructed with 4.5 mm thick pressed special section steel. The cross member is constructed with 4.0 mm thick pressed channel section steel. The outrigger is constructed with 4.0mm thick pressed channel section steel.

 **4.13 Customs**

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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.

Lashing fittings Twelve (12) 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 48 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 100 mm higher from the floor and 150 mm lower from the bottom surface of top corner fitting and middle of corner post.

Each lashing rod on the corner post is designed to provide a "1,500 kgs pull load in any direction" without any permanent deformation.

Shoring slot A shoring slot, having a size of 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.

Ventilator Each container will have four labyrinth type small plastic ventilators.

Each ventilator is fixed to the R/H and L/H upper part of each side wall by three 5.0 mm dia. aluminum Huck bolts 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**

1) All steel surfaces - prior to forming or after - will be fully abrasive shot blasted conforming to Swedish Standard SA 2 1/2 to obtain the surface roughness at 30 to 50 microns which can result in the removal of all the rust, dirt, mill scale and all other foreign materials.

2) Lock road 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.

4) Sealant for joints Each perimeter of the floor, all the overlapped joints of inside, all the holes for bolts and nuts and all the places where may leak water will be sealed to give prevention against water entry. The sealant supplier shall according to china shipping nominate or approved. Sealant Materials: a. Chloroprene (Cargo contact area) b. Butyl (Hidden parts)

 **5.2 Coating**

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.

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. Exterior of assembled container will be coated again with epoxy primer prior to top coating.

 **5.3 Total dry film will be (microns)**

	Exterior	Interior	Under structure
Epicon SC primer	40		
Epicon zinc SC B-2	30	30	30
Acrylic Topcat	40		
Epicon SC interior NP*		45	
Undercoating			200
Total	110	75	230

*Epoxy zinc rich primer and high build coating epoxy are not applied to the wooden.



6. Marking

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

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.

Specifications

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.

The owner's serial numbers and manufacturer's serial numbers will be stamped into the inside right rear corner post at eye level.

 **7. Testing**

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

<i>Test & loads</i>	<i>Test methods</i>
<p>A) Stacking</p> <p>1) Internal load : 1.8R-T Test load : 86,400 kg/post. post of 45' location</p> <p>2) Test load : 41,450kg/post Centric force per post: *At the 40' intermediate frames *The 45'end frames with bottom unit supported at the 40' intermediate frames.</p> <p>3) Test load : 27,430kg/post of the 40'intermediate frame Centric force per post: (At the 40' intermediate frames with bottom unit supported at the 45' intermediate frames.)</p>	<p>Hydraulic cylinder load will be applied to each corner post through top corner fittings.</p> <p>Offset : 25.4 mm lateral38.0 mm longitudinal</p> <p>Time duration : 5 minutes</p>
<p>B) Lifting (from top corner fitting 40' & 45' location Internal load : 2R-T</p>	<p>Lifting vertically.</p> <p>Time duration : 5 minutes</p>
<p>C) Lifting (from bottom corner fittings 40' & 45' location) Internal load : 2R-T</p>	<p>Lifting 30 deg. to the horizontal.</p> <p>Time duration : 5 minutes</p>
<p>D) Restraint (longitudinal) 40' & 45' location Internal load : R-T Test load : 2R</p>	<p>Hydraulic cylinder load will be applied to the bottom side rails. Two times for pulling and pushing.</p> <p>Time duration : 5 minutes</p>
<p>E) Floor strength. Test load : 7,260 kgs (16,000 lbs)</p>	<p>Use of a special truck. Total contact area : 284 cm² Wheel width : 180 mm Wheel center : 760 mm</p>
<p>F) Wall strength (front) Test load : 0.4(R-T)=0.4P</p>	<p>Compressed air bag will be used.</p> <p>Time duration : 5 minutes</p>
<p>G) Wall strength (side) Test load : 0.6(R-T)=0.6P</p>	<p>Compressed air bag will be used on one side only.</p> <p>Time duration : 5 minutes</p>
<p>h)Wall strength (door) Test load : 0.4(R-T)=0.4P</p>	<p>Same as front wall strength test.</p>

i) Roof strength (weakest part) Test load : 300 kg	Applied area will be 600x300 mm longitudinal and transverse.
j) Racking (transverse) Test load : 15,240 kg	Hydraulic cylinder load will be applied to the header rail through top corner fittings. Two times for pulling and pushing. Time duration : 5 minutes
k) Racking (longitudinal) Test load : 7,620 kg	Hydraulic cylinder load will be applied to the top side rail through top corner fitting on one side only. Two times for pulling and pushing. Time duration : 5 minutes
L) Operation of door	After completion of test, the operation of doors, locks, hinges, etc. will be checked.
M) Dimensions and weight	After completion of test, the dimensions and weight will be checked.
N) Weatherproofness	Inside dia. of nozzle : 12.5mm. Distance : 1.5 m. Speed : 100 mm/sec . Pressure : 1 kg/cm ²

* Note: R - Maximum Gross Weight

T - Tare Weight

P - Maximum Payload

 **8 Guarantee****Structure**

All the containers shall be guaranteed by manufacturer to be free from defects in materials, workmanship and structure for a period of two (2) years from the date of acceptance of the container by the buyer.

Painting

The paint system coated on the container surface shall be guaranteed to be free from corrosion and failure for a period of three (3) years from the date of acceptance of the container by the buyer.

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.

If the corrosion exceeds RE3 as defined above within the guarantee period, inspection of the corrosion shall be carried out by the buyer.

Decals

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



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