RContainer AS
Org.nr: 991 296 484

Kontor/Lager
1929 Auli
Haga Næringspark
Post@RContainer.no
Tlf: 63 80 09 80
Man-Fre: 08:30-16:30

Faktura avdeling:
5600 Norheimsund
Anniken@RContainer.no
Tlf: 48 12 08 44

Leverandør av:
Moduler
Industrihaller
Modulvogner
Containere
Offshore
Aggregater
Toaletter

TECHNICAL SPECIFICATION

FOR

STEEL DRY CARGO CONTAINER

10'x8'x8'6" ISO 1DD TYPE

RContainer AS
Org.nr: 991 296 484

Kontor/Lager
1929 Auli
Haga Næringspark
Post@RContainer.no
Tlf: 63 80 09 80
Man-Fre: 08:30-16:30

Faktura avdeling:
5600 Norheimsund
Anniken@RContainer.no
Tlf: 48 12 08 44

Leverandør av:
Moduler
Industrihaller
Modulvogner
Containere
Offshore
Aggregater
Toaletter

WWW.RCONTAINER.NO

1. General

1.1 Scope

This specification will cover the design, construction, materials, testing and inspection performances of 10'x8'x8'6" ISO. 1DD type steel dry cargo containers.

1.2 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.(-40.) to +70.(+158.) 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, unless otherwise mentioned in this specification.

1.3.1 ISO Container Standards (1DD type)

ISO 668 - Series 1 freight containers - Classification external dimensions and ratings (4th edition - 1988)
ISO 830 - Terminology in relation to freight container (1st edition - 1981)

ISO 1161 - Series 1 freight containers - Corner fittings Specification (4th edition - 1984)

ISO 1496-1 - Series 1 freight containers - Specification and testing.

Part 1: General cargo containers for general purposes (5th edition - 1990)

ISO 6346 - Freight containers - coding, identification and marking (3rd edition - 1995)

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 the Commonwealth Department of Health, Australia.

1.3.5 Classification society

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

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 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.

1.5 Transportation

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

a) Marine: In the ship cell guides of vessels, six (6) high stacked.
On the deck of vessels, four (4) high stacked and secured by vertical and diagonal wire lashings.

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

2. Dimensions and Ratings

2.1 External Dimensions

- Length 2,991 + 0mm
  - 5mm
- 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: 10 mm
- Front and rear diagonals: 10 mm

2.2 Internal Dimensions (nominal)

Length 2,840 mm

Width 2,352 mm

Height 2,393 mm

2.3 Door opening Dimensions (nominal)

Width 2,343 mm

Height 2,280 mm

2.4 Internal cubic capacity (Nominal)

15.95cu.m 563.3 cu.ft

2.5 Forklift pockets

Width 320 mm

Height min. 115 mm

Center to center 900 mm +/- 50 mm

2.6 Ratings

Max. Gross Weight (R) 10,160 kgs 22,400 1bs

Tare Weight (design) (T) 1,300 kgs 2,870 1bs

Max. Payload (P) 8,860 kgs 19,530 1bs

3. Materials

3.1 General

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

3.2 Part specification

RContainer AS
Org.nr: 991 296 484

Kontor/Lager
1929 Auli
Haga Næringspark
Post@RContainer.no
Tlf: 63 80 09 80
Man-Fre: 08:30-16:30

Faktura avdeling:
5600 Norheimsund
Anniken@RContainer.no
Tlf: 48 12 08 44

Leverandør av:
Moduler
Industrihaller
Modulvogner
Containere
Offshore
Aggregater
Toaletter

Parts Materials by JIS

1) Door panels	Anti-corrosive steel. SPA-H or equivalent
Roof panels	Y.P.: 343 N/mm2
Side panels	T.S.: 481 N/mm2
Front panels	
2) Door header	Structural steel. SS400 (SS41)
Front top end rail	Y.P.: 245 N/mm2
Front bottom end rail	T.S.: 402 N/mm2
Door horizontal frames	
Floor center rail	Cut-out channel steels
Forklift pocket	
3) Bottom side rails	Rolled high tensile steel. SM490A (SM50A)
Cross members	Y.P.: 324 N/mm2
Front corner posts	T.S.: 490 N/mm2
Rear corner posts (outer & inner)	
Door sill	
4) Top side rails	Structural steel rectangular pipe. STKR400 (STKR41)
Door vertical frames	Y.P.: 235 N/mm2
	T.S.: 402 N/mm2

RContainer AS
Org.nr: 991 296 484

Kontor/Lager
1929 Auli
Haga Næringspark
Post@RContainer.no
Tlf: 63 80 09 80
Man-Fre: 08:30-16:30

Faktura avdeling:
5600 Norheimsund
Anniken@RContainer.no
Tlf: 48 12 08 44

Leverandør av:
Moduler
Industrihaller
Modulvogner
Containere
Offshore
Aggregater
Toaletter

WWW.RCONTAINER.NO

5) Door locking bars	Structural steel round pipe. STK400 (STK41) Y.P.: 235 N/mm2 T.S.: 402 N/mm2
6) Corner fittings	Casted weldable steel. SCW480 (SCW49) Y.P.: 275 N/mm2 T.S.: 480 N/mm2
7) Locking gear cams and keepers	S20C Y.P.: 245 N/mm2 T.S.: 402 N/mm2
8) Door hinges	S25C Y.P.: 265 N/mm2 T.S.: 441 N/mm2
9) Door hinge pins Gasket retainers	Stainless steel.
10) Door gasket	EPDM
11) Floor	Plywood board
12) 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 and front wall, horizontal-corrugated steel double doors at rear end, die-stamped steel roof and corner fittings.

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

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 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.

4.2.2 The top corner fittings are to protrude a minimum of 6 mm 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 nominal 4 mm for the front and the rear.

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

4.4 Base frame structure

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

4.4.1 Bottom side rail

Each bottom side rail is built of a 50x158x30x4.5 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 the bottom surface of both side rails around the bottom corner fitting.

4.4.2 Cross member

The cross members are made of pressed channel section steel with a dimension of 45x122x30x4.0 mm for the normal areas and 75x122x45x4.0 mm for the floor butt joints.

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 3.0 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.

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

4.5 Flooring

The floor will consist of four 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 section steel floor center rail and the 3.0 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.

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 four screws per cross member but five 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 4.0 mm thick pressed open section steel is reinforced by two 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.

4.6.2 Rear corner post

Each rear corner post of hollow section is fabricated with 4.0 mm thick pressed steel outer part and 40x113x10 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 made of a 4.0 mm thick pressed open section steel having some internal gussets at the back of each locking cam keeper location

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, two 100x50x2.3 thick rectangular hollow section vertical frames for the post side and center side of door, 1.6 mm thick horizontally corrugated steel door panel, which are continuously welded within frames.

4.7.3 One set of galvanized "BE-2566 MN" locking assemblies with forged steel 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.

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 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.

4.8 Roof structure

The roof will be constructed with two five-corrugated (die-stamped) steel panels and one single-corrugated (die-stamped) steel panels

4.8.1 Roof panel

The roof panel is constructed with 1.6 mm thick die-stamped steel sheets having about 6.0 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.

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.

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

4.11.2 Front corner post

Each corner post is made of 4.0 mm 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 made of a 3.0 mm pressed open section steel.

4.11.4 Front wall

The trapezium section front wall is constructed with 1.6 mm thick vertically corrugated steel panels, butt welded together to form one panel, and continuously welded to front end rails and corner posts.

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 hoop rings are welded to each top and bottom side rail at recessed corrugations of side panels but not extruded any cargo space (total 8 rings).

Each lashing point is designed to provide a "1,000 kgs pull load in any direction" without any permanent deformation of lashing ring and surrounding area.

Two (2) lashing rods are welded to each corner post at the position of 150 mm higher from the floor and 200 mm lower from the bottom surface of top corner fitting.

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 of 62 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 hand upper part of each side wall by three 5.0 mm dia. steel 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

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):

RContainer AS
Org.nr: 991 296 484

Kontor/Lager
1929 Auli
Haga Næringspark
Post@RContainer.no
Tlf: 63 80 09 80
Man-Fre: 08:30-16:30

Faktura avdeling:
5600 Norheimsund
Anniken@RContainer.no
Tlf: 48 12 08 44

Leverandør av:
Moduler
Industrihaller
Modulvogner
Containere
Offshore
Aggregater
Toaletter

WWW.RCONTAINER.NO

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

Where	Paint name	DFT(u)
Exterior surface	Zinc rich primer	20
	Epoxy primer	40
	Acrylic top coating	40
	Total:	100
Interior surface	Zinc rich primer	20
	Epoxy high build coating	40
	Total:	60
Under structure	Zinc rich primer	20
	Bitumen	190
	Total:	210

6. Marking

6.1 Arrangements

The containers 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, 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 each

Internal load: 1.8R-T corner post through top corner fittings.

Test load: 22,860 kg/post. Offset: 25.4 mm lateral

38.0 mm longitudinal

Time duration: 5 minutes

B) Lifting (from top corner fitting) Lifting 60 deg. to the horizontal.

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

C) Lifting (from bottom corner Lifting 60 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 to the

Internal load: R-T bottom side rails.

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

Time duration: 5 minutes

F) Floor strength. Use of a special truck.

Test load: 5,460 kgs Total contact area: 284 cm2

(12,000 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 one side

Test load: 0.6(R-T)=0.6P 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 longitudinal

Test load: 300 kgs and transverse.

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

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

L) Dimensions and weight After completion of test, the dimensions and weight will be checked.

M) 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 three (3) 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.

8.2.3 If the corrosion exceeds RE3 as defined above within the guarantee period, inspection of the corrosion shall be carried out by the buyer, RCONTAINER and paint manufacturer to detect the cause.

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, RCONTAINER 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 RCONTAINER