Container certification quality scheme

Part II. Guidance for certification of CSC containers

CLIENT INFORMATION NOTE

Foreword.

At LRQA we are a Certifying Authority. The goal is to perform container design, inspection, and certification requirements in a clear and concise set of rules for both LRQA and its clients.

It covers the three main types of intermodal equipment for both new construction and in-service inspection:

1. **CSC/ISO/Intermodal Containers.**
2. **Offshore containers and equipment.**
3. **Tanks for the transport of dangerous goods.**

General

The LRQA Container certification Quality Scheme is published over four individual procedures.

CQS Part I	General Guidance.
CQS Part II	CSC/ISO/Intermodal Containers, (Part A: New Manufacture & Part B: In-service).
CQS Part III	Offshore containers and equipment, (Part A: New Manufacture & Part B: In-service).
CQS Part IV	Tanks for the transport of dangerous goods, (Part A: New Manufacture & Part B: In-service).

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Part A: New Build CSC Containers

1. Introduction

The LRQA Container Quality Scheme (CQS), encompasses the certification of transportable CSC/ISO/Intermodal containers, Offshore containers and tanks for the transport of dangerous goods when constructed or inspected in-service at manufacturer's works on an individual basis or on a quality assured series production line basis. LRQA CQS also includes requirements for in-service inspection of containers, portable tanks, and tank vehicles.

The scope of this procedure LRQA CQS Part II is the certification of New Build & In-Service CSC containers.

Part A: New Build CSC Containers
Part B: In-service CSC Containers

2. Responsibility

The primary responsibility for equipment meeting regulatory requirements is with the Manufacturer and their QC department for New Build equipment and the owner/ operator when the equipment is In-service.

Equipment shall not be presented to LRQA which is knowingly non-compliant with regulations unless the non-conformity is advised prior to survey.

LRQA as the Certifying Authority/ Inspection Body undertakes the inspection and certification of equipment covered by the procedure under the approval for LRQA Verification Limited.

3. Design appraisal & type approval

3.1. Design Appraisal

The manufacturer shall submit the technical file for design review, together with the list of approvals sought and what testing is required to meet the regulations. These details are to be reviewed by an authorised LRQA design surveyor to verify that the container will comply with the requested regulations/standards as applicable and that the container will safely transport cargo using normal road, rail, and sea transport systems.

On satisfactory completion of a design review a Design Appraisal Document (DAD) is to be issued. The DAD shall define which prototype testing, as per section 8, shall be required, be it full or partial, depending on the application and if previous prototype testing is considered.

3.2. Type Approval

CSC Containers are required to have a "Type Approval". It is the client's responsibility to ensure that the Type Approval for the units being manufactured comply with the latest standard/ Regulations. Type approvals which do not comply or are outside the 10 years validity need to be re-appraised and tested where applicable.

A type approval requires the manufacturer to perform appraisal of container design and to prototype test a container.

Where a manufacturer has opened a new factory (e.g. in another country)

and utilises the same quality control procedures and system as the factory for which the original prototype container was approved, and it can be demonstrated that key personnel from the original factory have been on site at the 'sister' factory for synchronisation of quality systems consideration of prototype testing will be considered in lieu of full prototype testing. Where a manufacturer is building a previously approved container (from another manufacturer) under license, full testing will be required.

Type approvals are specific to a manufacturer and its location.

The client submits technical documentation and details of container(s), together with the list of approvals sought.

The type approval submission should be in line with the submission requirements of LRQA.

3.3. Factory Quality Management System

The manufacturer's QC department shall demonstrate that they operate a QMS which can be followed to assure that the quality of the production units is comparable to that of the prototype. It is recommended that this is documented in agreement with the LRQA.

A site safety audit can be conducted together with the QC audit to ensure any attending LRQA surveyor can undertake their inspections in a safe manner with the correct PPE identified.

4. Specific container types

4.1. CSC Container and ISO- general Cargo Container (ISO 1496-1)

CSC Container is to meet the definition and requirement specified in CSC. An ISO container additionally is of a standard size specified in ISO 668, inspected and tested in accordance with the requirements of ISO 1496-1. A container can be for general purposes, or if a specific purpose, it can be either closed, vented/ventilated or open top. The details of materials used and strength of cargo containment structure, lifting and container securing arrangements are to be considered for approval.

4.2. Thermal Containers (ISO 1496-2)

As for general containers with additional performance test and approval of lining materials, thermal properties and cooling or heating systems. Method of securing cooling, heating units to the container are to be given.

4.3. Tank Containers (ISO 1496-3)

Main frame and attachments to shell is appraised like a general container. The cargo tank compartment is subject to design appraisal for compliance with a recognised pressure vessel code in the applicable regulations considering requirements of the various regulations concerning carriage of dangerous goods, or if non-hazardous then relevant national legislation. The frame is considered for testing similarly to an ISO 1496-1 general cargo container, except forklift/floor/side wall/end wall loadings are not applicable and replaced by Longitudinal Internal restraint (dynamic) and Lateral restraint tests.

4.4. Non-pressured containers for dry bulk (ISO 1496-4)

Non-pressurised containers for dry bulk, also applicable for BK2 hazardous substances. Hopper types are considered for testing as the same as box types, except floor/side wall/end wall loadings are not applicable and replaced by internal longitudinal restraint and lateral restraint tests.

4.5 Platform and platform-based containers (ISO 1496-5)

Primarily used to transport heavy, over-height and over-width cargos, the flat rack comes in three formats, flatpack with fixed ends or fixed posts, flat rack with collapsible ends and flat rack with complete superstructure.

5. Standard container sizes and ratings

ISO 668 defines the standard ISO sizes for containers. Any deviation from these sizes requires decal and a clear statement on the DAD.

This deviation can only take the form of a variation in height, any change in length or width will affect the ability of the container to fit into a ship's load cell, and thus would not be ISO compliant.

Swap bodies used in Transocean services also apply to CSC in accordance with CSC 1972 2014 edition, non-standard stacking and racking values can be used, and they shall be clearly identified on the container and the safety plate in accordance with ISO 6346.

5.1. One door off operation or open- door operation

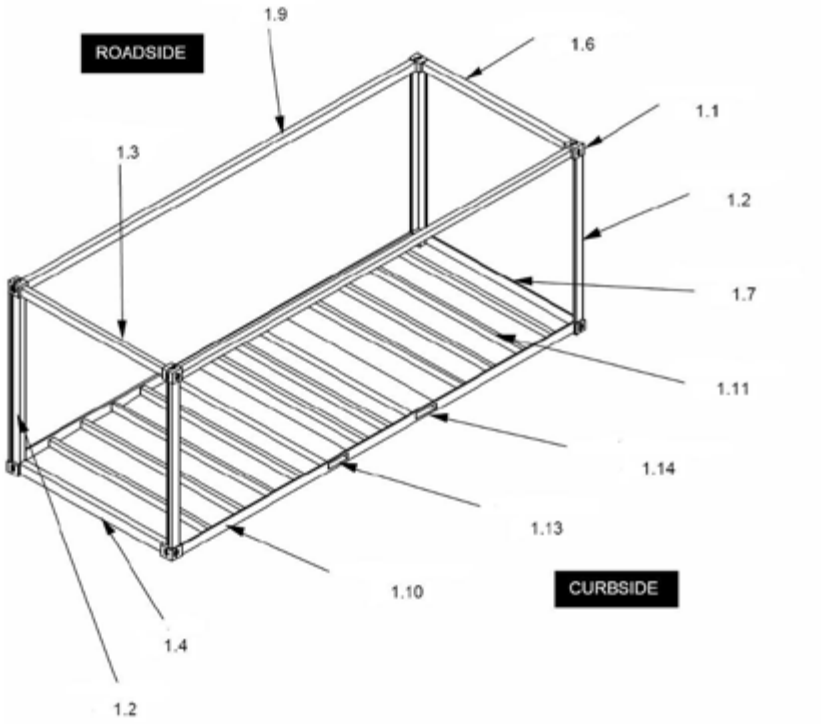
The removal of a door of a container to enable "one door off operation" or for containers which are transported by sea with one door open are a modification that may adversely affect the safety of the container. Consequently, it requires an appraisal by LRQA and appropriate marking on the CSC plate.

5.2. Reduced stacking and racking capability

Where the stacking value is less than 192,000 kg the value specified in ISO 1496 (e.g. 213,360 kg for a 1CC container) and/ or the racking value is less than 150 kN the containers is considered to have limited stacking or racking capability and shall be conspicuously marked on the CSC plate, by decals with the special type code in accordance with ISO 6346 and with a clear statement on the DAD.

6. Container terminology

This diagram specifies the primary parts of a container which influence its strength, defined as structurally sensitive components within CSC (and primary structure in offshore legislation). Therefore, if any of these are modified the approval is affected, and consideration of additional testing is required. An amended DAD should be reissued.



1.1 Corner Fitting. ISO 1161 compliant fittings, generally located at the eight corners of the containe structure to provide means of handling, stacking and securing containers.

1.2 Corner Post. Vertical structural member located at the four corners of the container and to which the corner fittings are joined.

1.3 Door Header. Lateral structural member situated over the door opening and joined to the corner fittings in the door end frame.

1.4 Door Sill. Lateral structural member at the bottom of the door opening and joined to the corner fittings in the door end frame.

1.6 Top End Rail. Lateral structural member situated at the top edge of the front end (opposite the door end) of the container and joined to the corner fittings.

1.7 Bottom End Rail. Lateral structural member situated at the bottom edge of the front end (opposite the door end) of the container and joined to the corner fittings.

1.9 Top Side Rail. Longitudinal structural member situated at the top edge of each side of the container and joined to the corner fittings of the end frames.

1.10 Bottom Side Rail. Longitudinal structural member situated at the bottom edge of each side of the container and joined to the corner fittings to form a part of the under-structure.

1.11 Cross Member. Lateral structural member attached to the bottom side rails that support the flooring.

1.13 Forklift Pocket. Reinforced tunnel (installed in pairs) situated transversely across the under-structure and providing openings in the bottom side rails at ISO prescribed positions to enable either empty capacity or empty and loaded capacity container handling by forklift equipment.

6.1. Container identification supplement

S Length between centres of apertures in corner fittings

P Width between centres of apertures in corner fittings

C_1 Corner fitting measurement $101.5^{+0}_{-1.5}$ mm ($4^{+0}_{-1/16}$ in)

C_2 Corner fitting measurement $89^{+0}_{-1.5}$ mm ($3\ 1/2^{+0}_{-1/16}$ in)

L External length of the container

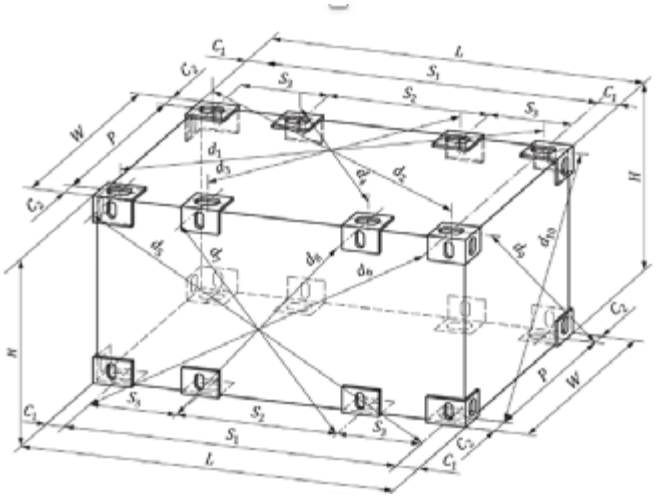
W External width of the container

H Overall height of the container

D Distance between centres of apertures, or projected reference points there from, of diagonally opposite corner fittings, resulting in six measurements: D_1, D_2, D_5, D_6, D_9 D_{10} or ten measurements same as before plus D_3, D_4 D_7 and D_8 for 1EE and 1 EEE container

K_1 Difference between D_1 and D_2 or between D_5 and D_6 : i.e. $K_1 = |D_1 - D_2|$ or $K_1 = |D_5 - D_6|$

K2 Difference between D_9 and D_{10}: i.e. $K_2 = |D_9 - D_{10}|$



Width (External) All containers: 2438 $^{+0}_{-5}$ mm					
HEIGHT (EXTERNAL) 2438 $^{+0}_{-5}$ mm			HEIGHT (EXTERNAL) 2591 $^{+0}_{-5}$ mm		
HEIGHT (EXTERNAL) 2743 $^{+0}_{-5}$ mm			HEIGHT (EXTERNAL) 2896 $^{+0}_{-5}$ mm		
NOMINAL LENGTH	LENGTH EXTERNAL	S	P	K_1 max	K_2 max
	mm	mm	mm	mm	mm
45 ft	13716 $^{+0}_{-10}$	13509	2259	19	10
40 ft	12192 $^{+0}_{-10}$	11985	2259	19	10
30 ft	9125 $^{+0}_{-10}$	8918	2259	16	10
20 ft	6058 $^{+0}_{-5}$	5853	2259	13	10
10 ft	2991 $^{+0}_{-5}$	2787	2259	10	10

7. Prototype testing

A container made from any suitable material which satisfactorily performs the following tests without sustaining any permanent deformation or abnormality outside the requirements set out in Table 1, which would render it incapable of being used for its designed purpose shall be considered safe.

The dimensions, positioning and associated tolerances of corner fittings shall be checked having regard to the lifting and securing systems in which they will function.

R: maximum operating gross mass or rating means the maximum allowable sum of the mass of the container and its cargo.

T: tare means the mass of the empty container including permanently affixed ancillary equipment.

P: maximum permissible payload means the difference between maximum operating gross mass or rating and tare.

Note: *The standard CSC test requirements differ from the requirements specified in ISO 1496-1.*

8. CSC Prototype tests

The following tests are typically required by regulations and standards and shall be followed. Deviations from these tests are considered when requested by the manufacturer where the tests are not considered applicable, such as for specific intended use. This specified use and changes shall be communicated by the manufacturer to purchasers of the container thereafter.

8.1. Stacking

The container is to be placed on four level supports in the same plane, one under each corner fitting, with the base structure free to deflect.

The container is to be loaded to 1.8R. The load (1.8R-T) is to be uniformly distributed over the floor of the container.

A compressive force is to be applied simultaneously to each of the top corner fittings, through a pad of the same plan area as the bottom surface of a bottom corner fitting. The forces are to be held for not less than five minutes, during

for not less than five minutes, during which time the deflections of the corner posts and base frame are to be measured and recorded. The forces are then to be removed gradually.

The pads shall have a chamfered aperture of the same size as a bottom corner fitting. The pads shall also be equivalent in strength to a corner fitting, to permit full application of the ram force, and are to be interconnected in such a way as to minimize pad rotation or torsional effects. The planes of the application of the forces and the supports of the container are to remain horizontal and unchanged during the test.

The test is to be repeated with eccentric applications of force offset by 25 mm laterally and 38 mm longitudinally. The line of force is to be at the centre of the pad.

End frames may be tested individually to equivalent loads as described above. The compressive force is equal to 0.25 x 1.8 x the Allowable Stacking Weight for 1.8G.

8.2. Lifting from top corner fittings

The container is to be placed on four level supports on the same plane, one under each corner fitting, with the base structure free to deflect.

The load (2R-T) is to be uniformly distributed over the floor of the container.

Containers greater than 3,000 mm (10 ft) (nominal) in length shall have lifting forces applied vertically at all four top corner fittings.

Containers of 3,000 mm (10 ft) (nominal) in length or less shall have lifting forces applied at all four top corner fittings, in such a way that the angle between each lifting device and the vertical shall be 30°.

The container is to be lifted by forces applied to the top apertures of all four top corner fittings, in such a way that no significant acceleration or deceleration forces are applied. The container shall be suspended for not less than five minutes and shall then be lowered to its original position.

8.3. Lifting from bottom corner fittings

The container is to be placed on four level supports on the same plane, one under each corner fitting, with the base structure free to deflect.

The load (2R-T) is to be uniformly distributed over the floor of the container.

The container is to be lifted vertically utilising all four bottom corner fittings, in such a way that no significant acceleration or deceleration forces are applied. The line of action of the lifting forces shall be 38 mm outboard of the side face of the corner fittings and parallel to the sides of the container. The lifting slings are to meet approximately 610 mm above the roof, and the forces shall be applied at an angle of:

- 30° from the horizontal for containers of length 12,000 mm (40 ft) (nominal) or greater.
- 37° from the horizontal for containers of length 9,000 mm (30 ft) (nominal) and up to but not including 12,000 mm (40 ft) (nominal)
- 45° from the horizontal for containers of length 6,000 mm (20 ft) (nominal) and up to but not including 9,000 mm (30 ft) (nominal),
- 60° from the horizontal for containers of length less than 6,000 mm (20 ft) (nominal)

The container shall be suspended for not less than five minutes and shall then be lowered to its original position.

8.4. Lifting from forklift pockets (loaded containers)

The container is to be placed on four level supports on the same plane, one under each corner fitting, with the base structure free to deflect.

The load (1.25R-T, noted 1.6R-T for ISO) is to be uniformly distributed over the floor of the container.

The container is to be supported on two horizontal bars, each 200 mm wide, projecting 1830 mm into the forklift pockets, measured from the outer face of the side of the container. The bars are to be placed centrally in the pockets.

The container is to be lifted to a position clear of all obstructions, held in this position for not less than five minutes, and then lowered to its original position.

8.5.Lifting from grappler arm position

The container is to be placed on four level supports on the same plane, one under each corner fitting, with the base structure free to deflect.

The load (1.25R-T) is to be uniformly distributed over the floor of the container.

The container is to be lifted by four lifting devices at four locations where provisions had been made for grappler arms. The bearers of these devices have a contact surface of 32 mm (1-1/4 in) by 254 mm (10 in). The container is to be lifted for not less than five minutes, and then lowered to its original position.

8.6. Floor strength test- Concentrated

The container is to be placed on four level supports in the same plane, one under each corner fitting, with the base structure free to deflect.

CSC requirements:

A testing device loaded to a mass of 5,460 kg (12,000 lbs), that is, 2,730 kg (6,000 lbs) on each of two surfaces, having, when loaded, a total contact area of 284 cm2 (44 sq in), that is, 142 cm2 (22 sq in) on each surface, the surface width being 180 mm (7 in) spaced 760 mm (30 in) apart, centre to centre, should be maneuvered over the entire floor area of the container.

One pass is to be made along each side with the front wheels of the vehicle as close to the side wall as practicable. The vehicle is to be placed in the centre of the container floor and the deflection measured after 5 minutes.

ISO1496-1 requirements:

The test shall be performed using a test vehicle equipped with tyres, with an axle load of 7 260 kg (i.e. 3 630 kg on each of two wheels). It shall be so arranged that all points of contact between each wheel and a flat continuous surface lie within a rectangular envelope measuring 185 mm (in a direction parallel to the axle of the wheel) by 100 mm and that each wheel makes physical contact over an area within this envelope of not more than 142 cm2. The wheel width shall be nominally 180 mm and the wheel centres shall be nominally 760 mm. The test vehicle shall be maneuvered over the entire floor area of the container. The test shall be made with the container resting on four level supports under its four bottom corner fittings, with its base structure free to deflect. The width of the test load is limited to the overall width of the wheels.

One pass is to be made along each side with the front wheels of the vehicle as close to the side wall as practicable. The vehicle is to be placed in the centre of the container floor and the deflection measured after 5 minutes.

8.7. Longitudinal restraint (static test)

The container is to be placed on four level supports in the same plane, one under each corner fitting, with the base structure free to deflect.

The load (R-T) is to be uniformly distributed over the floor of the container.

The container is to be secured through the bottom apertures of the bottom corner fittings at one end, by twit locks or equivalent devices.

A compressive force equal to 2Rg is to be applied longitudinally through the bottom apertures of the same bottom corner fittings. The force is to be held for not less than five minutes, during which time the length of the container at the base is to be measured and recorded. The force is then to be removed gradually.

A tension force equal to 2Rg is then applied longitudinally through the bottom apertures of the same bottom corner fittings. The force is to be held for not less than five minutes, during which time the length of the container at the base is to be measured and recorded. The force is then to be removed gradually.

8.8. End wall strength test

The container is to be positioned in such a manner that the entire end wall is free to deflect. A force equal to 0.4Pg is to be uniformly distributed over the inside surface of the end wall.

The test load is to be held for not less than five minutes, during which time the deflection of the end wall is to be measured and recorded. The test load is then to be removed gradually.

Both ends of a container shall be tested except that where the ends are identical only one end needs to be tested. The end walls of containers which do not have open sides or side doors may be tested separately or simultaneously.

The end walls of containers which do have open sides or side doors should be tested separately. When the ends are tested separately the reactions to the forces applied to the end wall shall be confined to the base structure of the container.

8.9. Side wall strength test

The container is to be positioned in such a manner that the entire side wall is free to deflect. A force equal to 0.6Pg is to be uniformly distributed over the inside surface of the side wall.

The test load is to be held for not less than five minutes, during which time the deflection of the side wall is to be measured and recorded. The test load is then to be removed gradually.

Both sides of a container shall be tested except that where the sides are identical only one side needs be tested. Sidewalls should be tested separately and the reactions to the internal loading shall be confined to the corner fittings or equivalent corner structures. Open-topped containers shall be tested in the condition in which they are designed to be operated, for example, with removable top members in position.

8.10. Roof strength test concentrated

The container is to be placed on four level supports in the same plane, one under each corner fitting. A load equal to 300 kg is to be uniformly distributed over an area measuring 300 mm transverse by 600 mm longitudinal to the container, located, insofar as practicable, an unsupported area of the roof, and the deflection of the roof is to be measured and recorded.

The test load is to be kept in place for not less than five minutes, and then removed gradually. The test is to be repeated with the load turned through 90° to the container axis.

8.11. Transverse racking test

The container is to be empty and is to be placed on four level supports in the same plane, one under each bottom corner fitting. The container is to be restrained against lateral and vertical movement by means of twist locks through the bottom apertures of the bottom corner fittings.

A compressive force is to be applied to each of the two top corner fittings on one side of the container. The line of action is to be parallel to the end and base planes of the container. The force is to be applied through a pad equal in size to the side face of the corner fitting, with the line of force at the centre of the pad. The pad is to be of sufficient strength to prevent deformation by the ram. The forces are to be held for not less than five minutes, during which time the length of the diagonals of the end walls is to be measured and recorded. The forces are to be removed gradually.

A tensile force is then applied by a device whose contact area is to be as large as possible and applied to the inside surface of the outer wall of the corner fitting, through the centre of the side aperture. The forces are to be held for not less than five minutes, during which time the length of the diagonal of the end walls is to be measured and recorded. The forces are to be removed gradually.

In accordance with CSC, the value of compression and tensile force are to be based on the container design. According to ISO 1496, it is 150 kN.

8.12. Longitudinal racking test

The container is to be empty and is to be placed on four level supports in the same plane, one under each bottom corner fitting. The container is to be restrained against longitudinal and vertical movement by means of twist locks through the bottom apertures of the bottom corner fittings.

A force of 75 kN is to be applied to each of the two top corner fittings on one end of the container. The line of action is to be parallel to the side and base planes of the container. The force is to be applied first towards and then away from the top corner casting.

The forces are to be held for not less than five minutes, during which time the deflection of the top of the container with respect to the bottom of the container is to be measured and recorded. The forces are to be removed gradually.

NOTE: The container is to have both sides tested. If the sides are identical, only one side needs to be tested.

In the case of platform containers with fixed ends, folding ends, or free-standing corner posts, the top corner fittings at the sides of the container under test should be connected longitudinally by means of members representing lower longitudinal members in the side frames of a superimposed container. Alternatively, a test force of 50kN may be applied to the one end only.

For conformance to ISO requirements, the deflection is not to exceed 25.4 mm, except that for platform-based containers, the deflection is not to exceed 42 mm.

Care is to be taken that all measuring points are on the container and not on the test rig. otherwise, erroneous readings occur.

9. Weathertightness test

A jet of water is to be applied to all exterior surfaces, joints, and seams of the container from a nozzle of 12.5 mm inside diameter, at a pressure of 1.0 bar, being held at a distance of 1.5 metres from the container being tested. The speed of movement over the container is not to exceed 100 mm/s. The duration of this test is to be not less than fifteen minutes. There should be no evidence of water leakage inside the interior of the container.

10. Test sequence

LRQA's requirement is that all the specified tests are undertaken and do not dictate the sequence. It is normal for the test sequence to be specified in the technical specification reviewed for the design submission and referred to on the Design Appraisal Document (DAD). If an owner's specification is forwarded to LRQA detailing the test sequence this can be reviewed as part of the design appraisal process and referred to on the DAD, and the manufacturer advises accordingly if their sequence differs from the owners, and thus the manufacturer and owner can then agree the test sequence with LRQA. For production testing please refer to section 12.

11. Test acceptance criteria

Test Acceptance Criteria is determined with reference to ISO/TR15070:1996/ Amd.12005(E), Guidance on Structural Integrity are referenced to determine the test results. No evidence of water leakage inside the interior of the container shall be found.

Table 1: LRQA Criteria of Acceptability Of Frame During And After Testing

Test	Component	Maximum deflection during testing	Maximum permanent deflection
Stacking	Corner post Bottom side rail Cross members	5.0mm 6.0mm below lower face of casting 6.0mm below lower face of casting	2.0mm 3.0mm 3.0mm
Top & bottom lift	Bottom side rail Cross members	6.0mm below lower face of casting 6.0mm below lower face of casting	3.0mm 3.0mm
Base restraint(longitudinal)	Longitudinally	n/a	ISO length tolerance
End wall	Front end panel Doors[b]	60.0mm	7.0mm 6.0mm
Side wall	Side panel	80.0mm	8.0mm
Roof wall	Roof panel	40.0 mm	4.0 mm
Floor strength	Bottom side rails Cross members Gooseneck	N/A	3.0mm 4.0mm 5.0mm
Transverse racking	End frame[b,c] diagonally	60.0 mm	10.0mm
Longitudinal racking	Side frame at top fittings	25.0mm	6.0mm (for 20) 10.0mm (for 40)
Fork lift	Bottom side rails Cross members	No permanent damage	3.0mm 3.0mm
Dimensional check	Complete container	According to specification or ISO requirements	N/A
Top length shortening Flatracks	20 Units 30 & 40 Units	26.00mm 30.00mm	5.0mm 5.0mm
After testing maximum allowable residual deformation for Cross members			7.0mm (for 20) 6.0mm (for 40)

(b) Deformation should not affect security and door operation.
(c) The container should allow no water ingress.

12. Production testing

Production test results shall be recorded and shall be witnessed by the LRQA Surveyor. To be acceptable, the test results shall be consistent with those obtained on the prototype unit, and the acceptance criteria of Section 11.0 and Table 1 above applies.

The following tests are required:

(a) On every end frame sub-assembly, each corner post assembly shall be subjected to a tensile force of R/2, or if the quality control procedure of corner post and corner fitting assembly are deemed adequate, the pull test may be performed on one container in every 50 (or part thereof) produced.

(b) For production testing either one complete container in every 50 (or part thereof) produced is to be subjected to a Floor Strength Test, or for continuous production the production testing and sequence shall be agreed by specification between the manufacturer, owner and LRQA - typically the production testing will include top lift, bottom lift, stacking and floor strength test.

(c) Every completed container shall be subjected to dimensional check and inspection of the container, unless the manufacturing operation has sufficient jigs and fixtures to control dimensions and the quality control procedures assure their accuracy, the frequency may be modified. A Weathertightness Test shall be undertaken as applicable.

The frequency of production testing may be increased during the initial stages of production, and, for high production rates, may be varied by specific written agreement from LRQA, but typically the sample rate will be 1:250 containers where the manufacturer produces approximately 500 containers per day.

If production of a specific type approval has been interrupted for a period of 12 months a production test shall be undertaken on a selected unit of that type approval to ensure that represents similarities with the prototype.

The production inspection/verification of inspection may include:

- Dimensional control
- Visual inspection of weld preparation, welding, alignment, material marking etc.
- Review of material certificates
- Review of WPS/WPQ, Welders - Qualification Tests, welding consumables etc.
- Review of equipment documentation as necessary.
- Review of NDE documentation including NDE operator qualifications and NDE reports as necessary.
- Witness of production testing for container.

The relevant inspection procedure for the equipment to be inspected shall be used.

13. Customs requirements (TIR)

Where approval of Customs securing arrangements is requested, the owner or manufacturer are required to produce drawings detailing arrangements provided to ensure compliance with the Customs Convention for Containers.

A copy of the TIR handbook detailing the requirements can be downloaded using this link:

TIR Handbook

14. UIC requirements

For UIC the owner must register their owner designation with BIC. IRS 50592 has replaced UIC 592 with a view to simplify the registration process for non-ISO containers.

ISO standard containers of ISO dimensions of rating up to 36000kg do not need to have a coding plate. Containers rated at >36000kg are required to be registered at UIC.

15. Inspection – new build

When inspecting a prototype or a series of container production at manufacturers, the LRQA surveyor/inspector shall typically check the following:

- Conformity with Type Approval (validity of <10 years) and approved drawings
- Material identification plates etc., welding consumables
- Welder qualifications
- Corner fitting certification
- Prototype tests as required by Regulations.
- Production test history to validate acceptable test sampling and result

Regulations for serial production require batch testing of units, and Manufacturer will be advised of the number of tests required to be performed. Final inspection includes dimensional inspection, checking of markings / decals, review of CSC and Customs Plates. When units are accepted, they will be branded with the approval number and the LRQA emblem will be affixed to each container (LRQA hard stamp may be applied with special request from the client), and certification will then be issued.

15.1. Materials

The materials of the container are to be suitable for the intended use and are to be compatible when joined with other materials of different composition in the structure. The manufacturer's material traceability system shall be to the satisfaction of the LRQA surveyor, and material used shall be able to be identified to a grade and standards (and for offshore equipment and tanks to the type of material certification required by the application code).

It is the manufacturer's responsibility to use materials for the container that are suitable for the intended use, considerations shall be made for the contents and the environment. The materials shall be suitable for the type of cargo to be carried, including an allowance for corrosion if applicable.

15.2. Welding

For dry box / CSC containers, all welding is to be carried out by competent personnel (e.g. to State scheme or approved welder qualification) using approved welding procedures to the satisfaction of LRQA.

Approval of weld procedures and / or welders shall be performed by Independent Inspection Authorities accredited for the witnessing/ certification of welding. For CSC containers independent organisations e.g., state body (e.g. China Government scheme) nationally approved certification bodies accredited for the witnessing and certification of welding, recognition of such certification will be evaluated on a case-by-case basis. LRQA reserves the right to require verification of certification when deemed necessary.

Such verification may include re-qualification, testing prior to production, extra NDE and/or welding production tests.

15.3. Inspection- Frame

The LRQA surveyor / inspector will check for:

- Deformations in longitudinal members, corner posts, stays, cross members.
- Absence of fractures and cracking.
- Absence of corrosion.
- Absence of perforations caused by impacts or rough handling.
- Unacceptable repairs.
- Holed or missing flooring.
- Missing load bearing components.

Acceptance of allowable defects is based on tolerances, values stipulated in the relevant regulations or specific industry guidelines or Owners acceptable repair criteria about the inspection being performed.

15.4. Inspection- Markings

The LRQA surveyor checks that the container possesses the necessary CSC plates, customs plates and the correct markings / decals. Missing plates or markings must be replaced.

15.5. Container number and BIC code- Same font and font size as inspection.

According to ISO Standard 6346 (Freight Containers-coding, identification and marking), the BIC, with the assistance of a worldwide network of National Registration Organizations, assigns an owner code to every container owner or operating company. These codes are listed in the official 'CONTAINERS BIC-CODE' Register.

The identification system provides uniform international identification of containers, in documentation and in communication associated with the movement of containers from door to door. It consists of:

- The owner prefix (BIC code): three capital letters of the Latin alphabet to indicate the owner or principal operator of the container.
  The equipment category identifier, one capital letter as follows:
- **U** for all freight containers
- **J** for detachable freight container-related equipment
- **Z** for trailers and chassis
- The serial number: six Arabic numerals, left at owner 's or operator's option
- The check digit: one Arabic numeral providing a means of validating the recording and transmission accuracies of the owner code and serial number.

The prefix shall be registered at Bureau International des Containers (BIC). Additionally, BIC's Boxtech Global Container Database can be used to centralise data.

For more information:

BoxTech - BIC Boxtech | Global Container Database (bic-boxtech.org)

"Information as used in this section marking has been used in courtesy of Bureau International des Containers (BIC) Paris"

15.6. Inspection- Corner fittings

Corner fittings must be to the latest edition of ISO 1161 or the one referenced in the regulations. For rejected corner castings appendix 2 to this procedure shall be followed.

15.7. Inspection- Floor

When floorboard made by plywood, the following should be verified by the manufacturer:

- Thickness: 28mm
- Moisture content: less than 14%
- Plywood ply number: min. 19 piles
- Treatment: According to Australian BICON approved method
- After floor concentrated test, no breakage, including:

a. delamination/ply separation resulting from the internal shearing of the veneer or failure of the adhesive including peeling of the surface plies such that the plywood panel no longer acts as a single, composite structure. (Delamination at the edges caused by the abrasive action of the panels rubbing together at panel- to-panel joints is not included)

b. Cross-grain or transverse cracks in the plywood exterior veneers. (Splits or cracks running parallel to the exterior grain are to be further consideration)

Floorboard made by other materials will be special considered and as a minimum, need be passed the related prototype testing items for the design of container installed.

15.8 Reporting

The prototype test report ISO Series 1 Containers form FC3 (Form 5210A) is to be used to record prototype test information, such as test loads/forces, deflection readings, findings by the attending LRQA surveyor. Upon successful completion of prototype testing and receipt of the above test reports the 5210A form together with FC3 form are to be technically reviewed and certification is issued by the LRQA surveyor.

Where the inspection is unacceptable a non-acceptance note shall be issued to the client. The NAN shall be closed out prior to any further work being undertaken.

A copy of all the relevant documentation including certificates shall be retained by LRQA.

Part B: In-service CSC Containers

1. Introduction

This procedure covers the periodic inspection of CSC Containers in accordance with the requirement of CSC Convention.

CSC containers are required to be inspected either by a Periodic Examination Scheme (PES) or an Approved Continuous Examination Program (ACEP). Where the ACEP route is taken the owner is responsible for ensuring they are approved by the competent authority and comply with CSC.1/ Circ. 143.

Where a CSC inspection is required as part of a tank inspection, e.g. for a UN Portable Tank, or offshore container please refer to CQS Part III or CQS Part IV

2. Responsibility

When the equipment is in-service, the primary responsibility for ensuring that the equipment meets the regulatory requirements is with the owner/operator.

Equipment shall not be presented to LRQA which is knowingly non-compliant with regulations unless the non-conformity is advised prior to survey. LRQA as Inspection Body undertake the inspection and certification of equipment.

The Owner is responsible for submitting the container for its periodic examination, within the statutory time limits, Limits. For a container operating under a Periodic Examination Scheme (PES) the interval from the date of manufacture to the date of the first examination must not exceed five years. Subsequent examinations should be at intervals of not more than 30 months. For a container operated under an Approved Continuous Examination Programme (ACEP) the examination should be carried out in connection with a major repair, refurbishment or on-hire/ off-hire interchange but in no case must the interval without an examination exceed 30 months.

3. Inspection Procedure

3.1. General

A CSC approved container shall be examined at intervals of not more than 30 months, except that for containers approved as new containers, the interval from the date of manufacture to the date of the first examination must not exceed five years. The Owner is responsible for submitting the container for its periodic examination, within the statutory time limits. Containers to be inspected must be safely and easily accessible and must be clean and gas free. If an internal inspection is required, the container must be certified as gas free, as required by regulations.

3.2. Inspection

The periodic examination consists of:

- Review of initial CSC certificate and/ or last periodic inspection certificate, and review of the owners system of maintaining records.
- Review of CSC plate, which aligns with the information in the point above, and with the manufacturer's serial number welded into the frame.
- An external visual examination of the container frame for any damage (fractures, holes, deformations) as per Table 1 and Table 2 below, with a particular focus on the corner fittings. The location shall have facilities to enable the top and underside of the container to be safely examined, completely, so that the attending LRQA surveyor can safely access the unit under inspection in its entirety.
- Ensuring satisfactory operation of the container door, seal and locking rods.
- An internal visual examination of the container shall be undertaken. Container units should be presented for inspection in the empty state to facilitate a complete inspection of the internal elements. If this is not possible, at the time of inspection, the LRQA surveyor can request an additional inspection where there are concerns raised at the time of inspection (e.g. damaged panels, indications of rot or damage to the floor etc.) and shall note on their certificate which areas were inaccessible for inspection. An internal inspection is always required when the inspection is undertaken beyond the previous specified next examination date.
- Check marking compliance.
- Stamping / punching the next examination date on the CSC plate and review of decals.
- Issuance of CSC (PES) Certification.

The use of decals should be allowed to indicate the date of the first examination and subsequent re-examination of a container examined at intervals specified in the CSC Convention provided that:

1 The relevant date (month and year) is shown in internationally recognisable words or figures on the decals or on the plate itself.

2 The date of the first examination for new containers is shown by decals or otherwise on the plate itself in accordance with section 2.2 annex I of the CSC regulation; and

3 The decals have a white background with lettering that are coloured in accordance with the year of next examination as follows:

Black	2020, 2026
Green	2021, 2027
Brown	2022, 2028
Blue	2023, 2029
Yellow	2024, 2030

3.2.1. Review of initial CSC certificate and/or last periodic inspection certificate

Several containers may be presented for inspection and previous certificates are not made available. Reference is made to CSC.1/ Circ.138 Rev.1: Section 13, which states that the owner shall maintain a system where examination records are kept, if not a certificate then the following :-

- Owner's unique (asset) number.
- Date and location when last examination was carried out, and identification of whom.
- The result of the previous examination.
- Date of the next examination (from the previous periodic examination).

If the certificate is not available then the LRQA surveyor shall satisfy themselves that the above is complied with, before the certificates are issued, which may be after the decal inspection plate is marked.

3.2.2 Examination of CSC Plate

Every CSC container presented for inspection must have a legible CSC plate, which shall be reviewed at the time of inspection. During this review the LRQA surveyor shall assess if there are visible modifications, which may affect the container's original type approval. The CSC plate shall match the data presented to the LRQA surveyor. The serial number shall be verified by cross referencing the welded markings on the frame.

3.2.3. Frame Inspection

In accordance with Annex 1 Chapter 1 Regulation 2 of the Convention Safe Containers (2014) regulations, to ascertain if unit is fit for purpose (Suitable to be lifted and transported), particular attention shall be made to structurally sensitive components as defined in CSC 2014.

The frame shall comply with the requirements of CSC, specifically for the following structurally sensitive components a container should be examined for serious deficiencies: -

1. **Top rail**
2. **Bottom rail**
3. **Header**
4. **Sill**
5. **Corner posts**
6. **Corner and intermediate fittings**
7. **Under structure**
8. **Locking rod**

The attachment of the shell to the container frame should also be examined for any readily visible serious structural deficiency comparable to that specified in the tables below.

Additionally, the flooring should be in good condition, securely attached and there shall be a visual inspection of door furniture and seals (operation of doors to be carried out if deemed necessary).

The effect of two or more items of damage in the same structurally sensitive component, even though each is less than that specified in the above table, could be equal to, or greater than, the effect of a single item of damage listed in the table. In this case the damage should be reported to LRQA and be repaired under the supervision of the LRQA surveyor where the scope of the exceptional inspection is agreed.

The overall deformation is the total deformation (single or multiple defects) combined on the same member, where such defects are located in close proximity, which is specified as being within 300 mm of each other:

E.g., a component has 3 defects at 20mm long x 5mm deep, which are at locations 1000mm, 1200mm and 1450mm from the datum – as these defects are within 300mm of each other they shall be added together (20mm+ 20mm+ 20mm = 60mm) - totaling 60mm long x 5mm deep or 1 defect at 60mm long x 5mm deep which requires a repair.

The below tables show the maximum acceptable deformations during inspection.

Table 2 is the CIC-2 inspection criteria and should be used during inspections. Table 3 is the CSC inspection criteria and if any deformation reaches these limits the container should be removed from service and repaired immediately. Clients should have some margin before the limits of Table 3 are met, which it is recommended that they are per the table 2 limits, both inspection criteria should be used in parallel with each other. If during the inspection table 3 is exceeded the LRQA surveyor shall issue a non-acceptance note.

Table 2- CIC-2 Inspection criteria - Information as used in table 2 below is used in courtesy of Container Owners Association

Component	Condition	Maximum acceptable deformation
All rails, including side rails, headers and sills and welds to corner fittings	Holed, cut, torn or cracked; broken component and/or weld Missing or loose parts or fasteners	REPAIR
Top side rail	Any deformation such as bend, bow, dent, etc.	If more than 30 mm (1-3/16 in) deep - REPAIR
Front headers & Rear headers	Any deformation such as bend, bow, dent, etc. EXCEPT on a header extension plate or corner protection plate	if more than 35 mm (1-3/8 in) deep - REPAIR
Bottom side rails, front and door sills	Any deformation such as bend, bow, dent, etc. Any deformation such as bend, bow, dent, etc. ON A FLANGE	if more than 50 mm (2 in) deep – REPAIR If torn, cracked, or cut - REPAIR
Door headers, rain gutter or sills	Interference with door closure, securement and/or weather tightness	REPAIR
All corner posts, including J-bars	Holed, cut, torn or cracked broken component and/or weld. Any deformation, such as bend, bow, dent, etc. Outward deformation	REPAIR If more than 20mm (13/16”) regardless of length or location - REPAIR If more than 5mm (3/16”) beyond. The plane of end surfaces or 10mm (3/8”) beyond plane of side surfaces of corner fittings REPAIR
Rear corner posts	Any deformation causing interference with door operation, securement or weather tightness	REPAIR
J-bars	Any deformation such as bend, bow, dent, etc. Door	Door must be able to open fully (270°). If door operation is impaired – REPAIR
All side/front panels	Holed, cut, torn or cracked; broken component. and/or weld Missing or loose parts or fasteners Inward deformation, such as bend, bow, dent, etc.	REPAIR REPAIR If more than 35mm (1-3/8”) measured on an exterior recessed corrugation - REPAIR
Side Panels	Outward deformation, such as bend, bow, dent, etc.	If more than 30mm (1-3/16”) measured on an interior recessed corrugation - REPAIR
Front Panels	Outward deformation, such as bend, bow, dent, etc.	If more than 15mm (1-3/16”) measured on an inside recessed corrugation - REPAIR
Lashing fittings	Broken parts and/or welds; missing or loose parts or fasteners	REPAIR
Ventilator covers	Broken, missing, etc.	If cracked or broken in the enclosed baffled area of ventilator REPAIR
Door assembly, including hardware	Holed, cut, torn or cracked; broken component and/or weld Missing or loose parts or fasteners Any deformation, such as bend, bow, dent, etc. Seized, frozen or stiff Not light-tight	REPAIR REPAIR If door operation or securement is impaired, REPAIR If door operation or securement is impaired, REPAIR REPAIR
Door panels	Any deformation such as bend, bow, dent, etc.	If internal cube intrusion is greater than 35 mm (1-3/8 in), - REPAIR
Door gaskets	Loose or missing Cut, torn, cracked or burned	If not light-tight or if the outer lips of the top horizontal gaskets are not fully in place and seated against the header - REPAIR
Roof panels, header extension plates and corner protection plates	Holed, cut, torn or cracked; broken component and/or weld	REPAIR

Component	Condition	Maximum acceptable deformation
Corner protection plates and header extension plates	Any deformation, such as bend, bow, dent, etc	If more than 40 mm (1-9/16”) below the top surfaces of top side rails - REPAIR
All roof panels	Downward deformation such as bend, dent etc. Upward deformation such as bend, dent etc.	If more than 40 mm (1-9/16”) below top surfaces of top side rails - REPAIR If more than 40 mm (1-9/16”) above top surfaces of top side rails - REPAIR
Floor and centre rail	Holed	REPAIR If light leaks, regardless of diameter of hole
Wooden flooring	Delamination or splinters Downward deformation such as a bend or bow Gouges (regardless of length)	REPAIR If more than 15 mm (9/16 in) measured transversely at the floor screw centre line – REPAIR REPAIR If more than 15 mm (9/16 in) deep OR if more than 5 mm (3/16 in) deep and width of more than 150 mm (6 in) of the gouge, REPAIR
Plank flooring	Cracked or Split	If light leaks, - REPAIR
Threshold Plate	Bent Upwards	If more than 5 mm (3/16 in), - REPAIR
Crossmembers, Forklift pocket components (including straps), Outriggers Gooseneck tunnel components	Holed, cut, torn or cracked; broken component and/or weld Missing or loose parts or fasteners Downward deformation, such as bend, bow, dent, etc. Any deformation such as bend, bow, dent, etc. ON A WEB Any deformation such as bend, bow, dent, etc. ON A BOTTOM FLANGE Any deformation such as bend, bow, dent, etc. ON A TOP FLANGE TOP FLANGE separated from bottom of wood or steel flooring	REPAIR REPAIR If more than 15 mm (9/16 in) from its original position or below the plane of the lower surfaces of the bottom corner fittings - REPAIR If more than 50 mm (2 in) in any direction, REPAIR If torn, cracked or cut - REPAIR If intrusion into container is more than 50 mm REPAIR If separation at point of attachment to floor, measured at the formed edge of the top flange, is more than 10mm (3/8 in), REPAIR
Gooseneck tunnel assembly and forklift pocket top plate	Any deformation such as bend, bow, dent, etc.	If more than 50 mm (2 in) REPAIR
Markings required by regulations / standards	Missing, loose or defaced	REPAIR
Markings required by owner	Missing, loose or defaced	Consult with owner
Marking plates	loose, broken, missing plate or fasteners; illegible data	REPAIR
CSC Safety approval plate	Periodic examination mark	Examination according to owners approved procedure
Corner fittings and their weld attachments	Cracked, loose, broken; apertures outside ISO dimensional tolerances	REPAIR
Entire Container	Any deformation such as bend, bow, dent, etc. that affects ISO required diagonal dimensions between comer fitting apertures	If deformation exceeds ISO tolerances, REPAIR

Component	Condition	Maximum acceptable deformation
End frame components (corner posts, doors, headers, sills, corner fittings)	Any deformation such as bend, bow, dent, etc. that affects other ISO required dimensions	If deformation exceeds ISO tolerances plus 5 mm (3/16”) on end faces or plus 10 mm (3/8”) on side faces, REPAIR
Corrosion	Structurally unsafe Holed	REPAIR Note: only use an approved inspection hammer to investigate corrosion. Repair
Improper repairs	Structurally safe Structurally unsafe	No Action REPAIR
Cleaning	Dangerous goods residue Pest infestation Contamination or odour that can be transferred. Foreign material, lashings or dunnage impeding loading of cargo	REMOVE in compliance with health & safety procedures. REMOVE in compliance with health & safety procedures. REMOVE REMOVE
Surfaces	Glue or tape (Sticky) Offensive graffiti or misleading foreign marks Hazard placards / labels	REMOVE REMOVE REMOVE
Ventilators	Blocked, loose, damaged and not weathertight, missing	REPAIR
Front and door headers Door assembly		OUTWARDS: Maximum 5 mm (3/16”) beyond plane of end surfaces of corner fittings UPWARDS (headers): Maximum 4 mm (5/32”) above plane of upper surfaces of top corner fittings
Front and door sills		OUTWARDS: Maximum 5 mm (3/16”) beyond plane of end surfaces of corner fittings DOWNWARDS: Not below the plane of the lower surfaces of the bottom corner fittings
Fork-lift pocket strap		DOWNWARDS: Minimum 10 mm (3/8”) above plane of the lower surfaces of the bottom corner fittings UPWARDS: See “Fork-lift pocket opening HEIGHT” below
Fork-lift pocket opening		WIDTH: “LOADED” pockets: Minimum 345 mm (13 5/8”) EMPTY pockets: Minimum 295 mm (11 5/8 in) HEIGHT: “LOADED” pockets: Minimum 105 mm (4 1/8”) EMPTY pockets: Minimum 92 mm (3 5/8 in)
Gooseneck tunnel		LENGTH: Minimum 3140 mm (123-7/8”); Maximum 3510 mm (138-1/4”) WIDTH of tunnel opening X: Minimum 1019 mm (40-1/8”); Maximum 1042 mm (41”) HEIGHT of tunnel opening B: Minimum 107 mm (4-1/4”); Maximum 130 mm (5-1/8”)
Door opening		WIDTH: Minimum 2281 mm (89-13/16’) HEIGHT: 8’ high container: Minimum 2129 mm (83-13/16”) 8’6” high container: Minimum 2256 mm (88-13/16”) 9’6” high container: Minimum 2560 mm (98-13/16”)

The frame shall also be inspected for improper frame repairs, being those defined as not complying with the IICL Repair Manual.

- Cuts or holes or gouges.
- Cracks or splits in welds or parent metal.
- Dents or distortions of a formed or folded edge or face greater than 15mm.
- Dents greater than 10 mm (0.4 inch) and less than 15mm (0.6 inch) in depth in excess of two per post.
- Dents greater than 10 mm (0.4 inch) extending over a length greater than 300 mm (12 inch).
- Twisted or bent or over-plated beyond the requirements of ISO.
- Severe corrosion.

For information concerning frame repairs and modifications refer to section 3.5 below.

Table 3 - CSC Structurally Sensitive Components and Definition of Serious Structural Deficiencies for Consideration
Information as used in table 3 below is used in courtesy of CSC.1/Circ.138/Rev.1

Structurally sensitive components	Serious deficiency requiring immediate out of service determination *(see also section 10.5)*	Deficiency requiring advice to owner and restrictions for transport	Restrictions to be applied in case of deficiencies according to column (iii)			
			Empty container		Loaded container	
			See transport	Other modes	See transport	Other modes
Top rail	Local deformation to the rail more than 60 mm or cracks or tears more than 45 mm in length. (see Note 1)	Local deformation to the rail more than 40 mm or separation or cracks or tears more than 10 mm in length. (see Note 1)	No restriction	No restriction	Bottom Lifting not allowed. Top lifting allowed only by use of spreaders without chains.	Bottom Lifting not allowed. Top lifting allowed only by use of spreaders without chains.
	Note 1: On some design of tank containers the top is not a structurally significant component.					
Bottom rail	Local deformation perpendicular to the rail more than 100 mm or separation cracks or tears in the rail's material more than 75 mm in length (see note 2)	Local deformation perpendicular to the rail more than 60 mm or separation cracks or tears in the rail's material of the upper flange more than 25 mm in length: or of web in any length (see note 2)	No restriction	No restriction	Lifting at (any) corner fitting not allowed	Lifting at (any) corner fitting not allowed
	Note 2: The rails material does not include the rails' bottom flange.					
Header	Load deformation to the header more than 80 mm or cracks or tears more than 80 mm in length	Load deformation to the header more than 50 mm or cracks or tears more than 10 mm in length	Container shall not be over stowed	No restriction	Container shall not be over stowed	No restriction

Structurally sensitive components	Serious deficiency requiring immediate out of service determination *(see also section 10.5)*	Deficiency requiring advice to owner and restrictions for transport	Restrictions to be applied in case of deficiencies according to column (iii)			
			Empty container		Loaded container	
			See transport	Other modes	See transport	Other modes
Sill	Local deformation to the post more than 100 mm or cracks or tears in excess of 100 mm in length	Local deformation to the post more than 60 mm or cracks or tears in excess of 10 mm in length	Container shall not be over stowed	No restriction	Container shall not be over stowed	No restriction
Corner posts	Local deformation to the post more than 50 mm or cracks or tears in excess of 50 mm in length	Local deformation to the post more than 30 mm or cracks or tears of any length. Weld separation of adjoining components of 50 mm or less.	Container shall not be over stowed	No restriction	Container shall not be over stowed	No restriction
Corner and intermediate fittings Front and door headers Door assembly	Missing corner fittings, any through cracks or tears in the fitting, any deformation of the fitting that precludes full engagement of the securing or lifting fittings (see Note 3) or any weld separation or adjoining components in excess of 50 mm in length		Container shall not be lifted on board a ship if the damaged fittings prevent safe lifting or securing	No restriction Container shall be lifted and handled with special care	Container shall not be lifted on board a ship	Container shall be lifted and handled with special care
		Any reduction in the thickness of the plate containing the top aperture that makes it less than 25 mm thick.	Container shall be lifted and handled with special care. Container shall not be over stowed when twist locks have to be used.	Container shall be lifted and handled with special care	Containers shall not be lifted by the top corner fittings	Container shall be lifted and handled with special care
		Any reduction in the thickness of the plate containing the top aperture that makes it less than 26 mm thick.	Containers shall not be over stowed when fully automatic twist locks are to be used.	Container shall be lifted and handled with special care.	Containers shall not be used with fully automatic twist locks.	Container shall be lifted and handled with special care

Note 3: The full engagement of securing or lifting is precluded if there is any deformation of the fitting beyond 5 mm from its original plane, any aperture width greater than 66 mm, any aperture length greater than 127 mm or any reduction in thickness of the plate containing the top aperture that makes it less than 23 mm thick

Structurally sensitive components	Serious deficiency requiring immediate out of service determination *(see also section 10.5)*	Deficiency requiring advice to owner and restrictions for transport	Restrictions to be applied in case of deficiencies according to column (iii)			
			Empty container		Loaded container	
			See transport	Other modes	See transport	Other modes
Understructure	Two or more adjacent cross members missing or detached from the bottom rails. 20% or more of the total number of cross members missing or detached. (see note 4).	One or two cross members missing or detached (see Note 4)	No restriction	No restriction	No restriction	No restriction
		More than two cross members missing or detached (see Notes 4 & 5)	No restriction	No restriction	Maximum payload shall be restricted to 0.5 x P	Maximum payload shall be restricted to 0.5 x P
	Note 4: If onward transport is permitted according to sections 10.5, it is essential that detached cross members are precluded from falling free. **Note 5:** Careful cargo discharge is required as forklift capability of the understructure might be limited.					
Locking rods	One or more inner locking rods are non-functional (see Note 6)	One or more inner locking rods are non-functional (see Note 6)	Container shall not be over stowed	No restriction	Container shall not be over stowed. Cargo shall be secured against the container frame and the door shall not be used to absorb acceleration forces - otherwise maximum payload shall be restricted to 0.5 P	Cargo shall be secured against the container frame and the door shall not be used to absorb acceleration forces - otherwise maximum payload shall be restricted to 0.5 P
	Note 6: Some containers are designed and approved (and so recorded on the CSC plate) to operate with one door open or removed.					

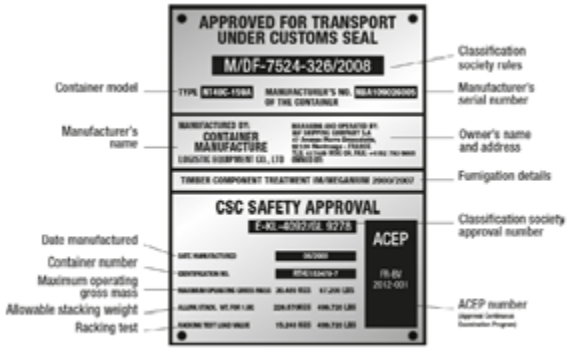
3.3 Marking Check.

The LRQA Surveyor/Inspector confirms that the container has all the required markings. Any missing or illegible markings must be renewed. Containers that have no safety approval plate or an incorrectly completed safety approval plate should be stopped.

The CSC plate must be legible and have all the required information, such as the example below:

Note: the sample below shows CSC plate in combination with Approved for Transport under Customs Seal.

The container is required to detail the maximum gross and tare mass.



Decals supplied in courtesy of Bureau International des Containers (BIC) Paris

Where the container is fitted with a ladder it is mandatory for the warning sign to be fitted to alert any overhead electrical danger. The height of the symbol shall be a minimum of 175mm, and the distance between the black borders should be 230mm. The warning sign shall be in the area adjacent to the ladder.

It is recommended that the height decal is in this vicinity, an example of which is shown on the right – note that the syntax of the decal can differ. The container may also have other decals such as “Super Heavy” depending on its operation.

The 2012 amendment of ISO 6346 altered the marking requirements for containers, specifically the size and type codes, eg, “22G1” in the diagram below.

There is not a requirement to modify the decals on a container unless the unit has reduced stacking, racking or lower side wall or end wall resistance.

For example, if the “22G1” container only had a stacking capability of 80,000 kg indicated on the CSC plate then the CSC plate must specify reduced stacking and the code “22GB” and reduced stacking must be clear and legible.

The decals arrangement of the door should comply with the following arrangement as applicable. This should be checked at the inspection to ensure it is correct.

3.4. Determination of Next Inspection Date

The next inspection is 2.5 years after the current inspection date, irrespective if the container has been inspected early, late or at an exceptional inspection, with the exception that the first inspection is 5 years after manufacture.

3.5. Exceptional Inspections

An exceptional inspection is required when there is a repair or modification to the container.

CSC Regulation 11 applies, the owner of an approved container that has been modified in a manner resulting in structural changes shall notify LRQA of the changes, who may require retesting of the modified container prior to recertification.

The supplement to CSC, from CSC Circular 138 Revision 1, Section 15 states that where containers are modified, the safety approval plate shall retain the original date of manufacture and additionally include the date of modification.

Where a container is repaired or modified, an exceptional inspection is undertaken and recorded by the LRQA Surveyor. Any changes to the original design and type approval, the LRQA Design Surveyor shall review the changes and issue a full or partial Design Appraisal Document.

As per the IICL Repair manual, the concept of “After repair, the strength of the repaired area should be greater than or equal to the original” shall be followed. Materials and parts used should be equal to (“like-for-like”) or of higher quality, strength, and thickness than the original. If the original material is Corten (corrosive-resistant high-strength low-alloy steel conforming to Japanese Industrial Standard G3125 or its equivalent) or other material with special chemical properties, that material must be used in replacement. If there is any doubt as to the type of material used in a container, consult the owner. If the original type of steel is unknown, use Corten steel to repair panels, since it has both high-tensile and corrosion-resistant properties. Welding consumables must be at least as strong as the parent materials being welded.

For dry box / CSC containers, all welding is to be carried out by competent personnel (e.g., to State scheme or approved welder qualification) using approved welding procedures to the satisfaction of this document.

The materials of the container are to be suitable for the intended use and are to be compatible when joined with other materials of different composition in the structure. The manufacturer’s material traceability system shall be to the satisfaction of the LRQA surveyor, and material used shall be able to be identified to a grade and supporting material certification. Where the original grade of material is unknown Corten steel shall be used of the same thickness and section. Modifications to containers and any requirements for extra testing will be assessed on a case-by-case basis.

It should be noted that any change in type of the container could affect the TIR approval of the units being modified.

It is recommended that the repair depot audit is undertaken against an agreed scheme with LRQA. Otherwise as a minimum shall operate a recognised quality management system, for example ISO 9001 or equivalent.

The following stages are recommended for exceptional inspection.

Repair	Validition test (s)
Reshaping of Panel	Visual Inspection by Owner
Patch Repair of Panel	Visual Inspection by Owner
Floor Repair	Visual Inspection by Owner
Straightening of Section	Visual Inspection by LRQA
Replacement of Panel	Visual Inspection by LRQA
Part Replacement of Floor	Visual Inspection by LRQA
Full Replacement of Floor	Visual Inspection, Floor Test
Patch repair on Section	Visual Inspection by LRQA, DPI or MPI if weld suspect
Part of Section Replaced	Visual Inspection by LRQA, DPI or MPI
Whole Section Replaced (e.g. corner post)	Visual Inspection by LRQA, DPI or MPI, Top Lift Test
Fork Pockets Replaced	Visual Inspection by LRQA, DPI or MPI, Fork Pocket Test
2 or More Whole Structurally Sensitive Sections Replaced	Visual Inspection by LRQA, DPI or MPI, Top Lift Test, Bottom Lift Test, Transverse Rigidity, Longitudinal Rigidity
Complete Reframe	All tests unless repairer has had similar frame tested then only Top Lift Test, Bottom Lift Test, Stacking and Floor Strength Test

4. Stamping

When container is accepted after inspection, stamping of the next inspection due date is to be stamped on the CSC plate.

5. Reporting

On successful completion of the survey, acceptable units will have their certificates issued by the attending LRQA Surveyor.

Where the inspection is unacceptable a non-acceptance note shall be issued to the client. The NAN shall be closed out prior to any further work being undertaken and before the release of any outstanding certification.

A copy of all the relevant documentation including certificates shall be retained by LRQA.

Get in touch

Visit **www.lrqa.com** or more information

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