

# COA Short span floor test

## In-depot container floor board short span test

### Introduction

This technical document describes a test procedure designed to be undertaken within a depot to assess that replacement floor boards conform to the required specification for use in the repair of ISO Dry Freight General Purpose containers.

The test is not intended to replicate the floor manufacturers' quality assurance laboratory test in its entirety but nevertheless provides a practical means for depot personnel to readily identify that replacement floor boards are of the required quality.

Original container floor designs and material are tested and verified as part of the original CSC container prototype design type approval and manufacturing process. It is required to maintain the floor specification in-service to the approved condition. Below specification replacement floor boards might lead to a service failure.

Replacement floor boards procured by the depot for a container repair should be specified "like for like" i.e. of equal thickness and specification to the original approved floor. Stocks of floor boards should be stored in suitable dry conditions.

Depot replacement floor suppliers should provide floor materials of the required quality which have been factory tested and marked to identify the specified material type.

The following guidance for a short span floor test do not alleviate the floor board manufacturer and or supplier undertaking relevant quality tests as part of the manufacture and procurement process.

This document does not take precedence over any contractual terms between parties. Container owners might require additional tests or documentary evidence to meet their specified requirements.

#### Disclaimer

This technical document is intended for qualified operatives who have completed appropriate technical and health and safety training.

Shippers, operators, carriers, service providers and other users should nevertheless undertake their own risk assessment and ensure the container is fit for purpose, safe and reliable for transport and in accordance with the owners CSC approved procedure and other relevant regulations applicable in the region of use.

The COA and its members and personnel cannot and do not assume any liability for damage to persons or property or other consequences of any procedures referred to herein or of any omissions relating to practices and procedures.

## 1. Specification of container wood floor boards.

Replacement floor boards supplied for container repairs should be “like for like” i.e. to a specification consistent with the original container floor type approval. New manufactured floors are designed for:

- Two concentrated loads, each of 2730kg (6000lbs) and each added to the floor within a contact area of 142cm<sup>2</sup> (22 sq. inch)
- Test device loaded to 5460kg (12000lbs) concentrated on two contact sources each of 142cm<sup>2</sup> (22sq inch) spaced 760mm (30in) apart manoeuvred over the entire floor

Depots should contact the container owner for the required replacement floor specification.

### 1.1 Identification marks

Each replacement floor board should display permanent identification marks on the longitudinal edges along the thickness of each board. The marks should at least display:

- Board manufacturer’s brand name
- Manufactures factory location
- Board type /product reference
- Date of manufacture of the board

### 1.2 Floor board specification

- Material – Bamboo and hybrid plywood or OSB (oriented strand board)
- Density: Minimum 700 Kg. cubic meter (KCM)
- Moisture content: <12%
- TCT treated Australian quarantine approved
- Standard dimension: 2400 x 1160 x 28 (tolerance length & width +/- 1mm, thickness +/- 0.8mm)

## 2. Short span floor test procedures in-depot




This test induces a bending load to the floor test sample to represent the designed shear force required to ensure that the container floor is adequate for the specified service conditions.

### 2.1 Safety during the test



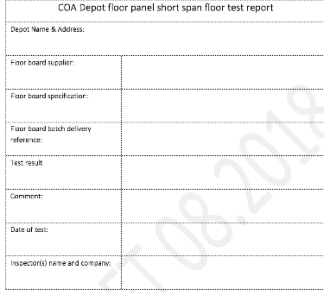
Operatives should be appropriately trained in health and safety at work requirements and wear appropriate protective clothing, eyewear and gloves.

- Ensure that the preparation and test is carried out in suitable work-shop conditions.
- Ensure that during the test inspector and any nearby persons are protected.




## 2.2 Equipment required for test

<p>1</p> 	<p>2</p> 	<p>3</p> 
<p>Test machine:</p> <ul style="list-style-type: none"> <li>Electrically powered hydraulic ram test machine. The machine shown is supplied by Eng-Kong,</li> </ul>	<p>Alternative design 1:</p> <ul style="list-style-type: none"> <li>An internet www search will provide a number of alternative suppliers of test machines.</li> </ul>	<p>Alternative design 2:</p> <ul style="list-style-type: none"> <li>An alternative is a basic designed and manufactured test rig.</li> </ul>

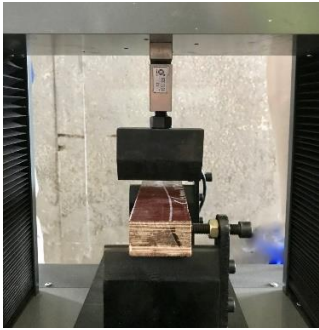


## 2.3 Inspector

<p>1</p> 	<p>2</p> 	<p>3</p> 
<p>Depot manager:</p> <ul style="list-style-type: none"> <li>The depot should appoint a qualified person to undertake the test, e.g. the depot inspector or supervisor.</li> </ul>	<p>Inspector:</p> <ul style="list-style-type: none"> <li>Stock boards to specification?</li> <li>Test sample as specified?</li> <li>Undertake the short span test.</li> <li>Complete the report.</li> </ul>	<p>Report test results:</p> <ul style="list-style-type: none"> <li>Supplier</li> <li>Specification</li> <li>Identification</li> <li>Result</li> <li>Comment</li> <li>Name and date</li> </ul>




## 2.4 Board test sample

<p>1</p> 	<p>2</p> 	<p>3</p> 
<p>Depot stock of floor boards:</p>	<p>Mark and cut test sample:</p>	<p>Test sample:</p>
<ul style="list-style-type: none"> <li>Randomly select a floor board from the batch supplied.</li> <li>Boards should be previously stored in dry conditions room temperature about 21°C (70°F) and relative humidity of 55%.</li> <li>The test sample moisture content should be about 10%</li> </ul>	<ul style="list-style-type: none"> <li>Mark the sample to be cut from the floor board 200mm (8") from the board edge and the long edge of the sample parallel to the floor board long edge (i.e. 2400mm edge of the board).</li> <li>The sample dimension should be 50mm x 305 mm x board thickness (2"x12").</li> <li>Cut the sample from the board. Ensure the cut edges are clean, straight cut and free of irregular profile or delamination.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure no strength reducing defects, dents, cuts and notches that might weaken the board.</li> </ul>

## 2.5 Test procedure

<p>1</p> 	<p>2</p> 	<p>3</p> 
<p>Place sample in the test machine:</p>	<p>Sample under load:</p>	<p>Record test load:</p>
<ul style="list-style-type: none"> <li>Operate the test machine in to the manufacturer's instructions.</li> <li>Adjust the two supports equidistant from the centre and 254mm (10") apart.</li> <li>The supports should be rounded with a radius of 6.35 mm (0.25").</li> <li>Position the test sample face up and spanning the supports.</li> </ul>	<ul style="list-style-type: none"> <li>Apply a constant load at the centre span of the test specimen.</li> <li>Tested using a constant loading block rate of motion of 2.0 mm/min (0.08 in/min) until maximum load is attained and failure has occurred.</li> <li>Record the maximum load upon test specimen failure.</li> </ul>	<ul style="list-style-type: none"> <li>Record the load and deflection data during the test to the nearest 0.025 mm (0.001") using a yoke and dial gauge assembly.</li> <li>Deflection shall be recorded every 0.15 mm (0.005") at the neutral axis.</li> <li>Photographs if required</li> </ul>

## 2.6 Pass / fail

1	2	3
		
Acceptable test sample:	Unacceptable sample:	Failed test sample:
<ul style="list-style-type: none"> <li>▪ An acceptable sample should bend but without breaking or separation (delamination) at minimum</li> <li>▪ 6,780N (690 kgs-force /1,525 lbs-force)</li> <li>▪ This board passed the test.</li> </ul>	<ul style="list-style-type: none"> <li>▪ An unacceptable floor board might splinter, separate (delaminate) or break at less than 6,780N</li> <li>▪ This board failed the test.</li> </ul>	<ul style="list-style-type: none"> <li>▪ In the event that a board fails the test, up to 7 test samples may be tested from other board(s) from the same batch.</li> <li>▪ If more than 20% of the tests fail, the batch of boards should be marked as “rejected for use in CSC compliant containers”</li> </ul>

## 3. Test Report

On completion of the test a test report should be completed.

COA Depot floor Board short span floor test report	
Depot Name & Address:	
Floor board supplier:	
Floor board specification:	
Floor board batch identification	
Test result	
Comment:	
Date of test:	
Inspector(s) name and company:	

## Appendix 1

### Test machine suppliers

Test machines are available from many sources. An internet search will locate suppliers.

The COA does not supply or recommend suppliers. In due course, a list of supplier will be published, to assist depots to select the machine that meets their needs.

Supplier	Country	Contact	Remarks
Mr Zhang	China	Tel: +86 187 6977 2983 Email: <a href="mailto:jnxlyq@163.com">jnxlyq@163.com</a>	
			Additional suppliers, as recommended by COA members, to be added

## Container Owners Association

The Container Owners Association publishes Technical Documents on a range of container-related subjects.

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