Company guidance for containers carriage

CONTAINER STOWAGE AND TANK TOP/HATCH COVER/DECK STRENGTH

The full weight of the container rests on the four bottom corner castings which is very small area. The timber dunnage is to be used between the container bottom tier and tank top/hatch cover/deck to spread the point load to the large area. Check and ensure that dry flat dunnage is placed under the containers on the tank top/hatch cover/deck as agreed with the charterer.

The heaviest container of a stack should be placed at lower position and light container at higher position.

LASHING COMPONENTS

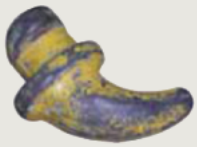
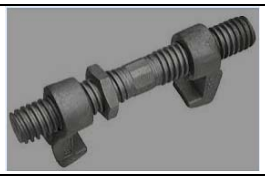
A variety of lashing components are used to secure containers. The table shows the locations where these components are commonly used.

Chains and tension levers are used in place of lashing rods and turnbuckles, but their purpose is same.

Description	Purpose	Image	Notes
Chain lashing with hooks	To secure/lash containers		Resists tensile loads. Hooks at each end.
Chain lashing tension lever/load binder	To tighten the chain lashing		Resists tensile loads and is used to keep the chain lashing tight.

Description	Purpose	Image	Notes
Lashing rod	To provide support for container stacks on deck. Used in conjunction with a turnbuckle.		Resists tensile loads. Very long lashing rods can be difficult to handle and difficult to locate in a container corner casting. They have eyes at each end.
Extension piece	To extend a lashing rod when securing 'high cube' containers.		Fit at the base of a lashing rod and connect to the turnbuckle.
Turnbuckle (bottle screw)	To connect a lashing rod to a flashing plate or D ring. Tightening puts tension into a lashing rod.		Resists tensile loads and is used to keep the lashing tight. Regularly grease its threads. Ensure the locking nut or tab is locked.

designated lashing rods.

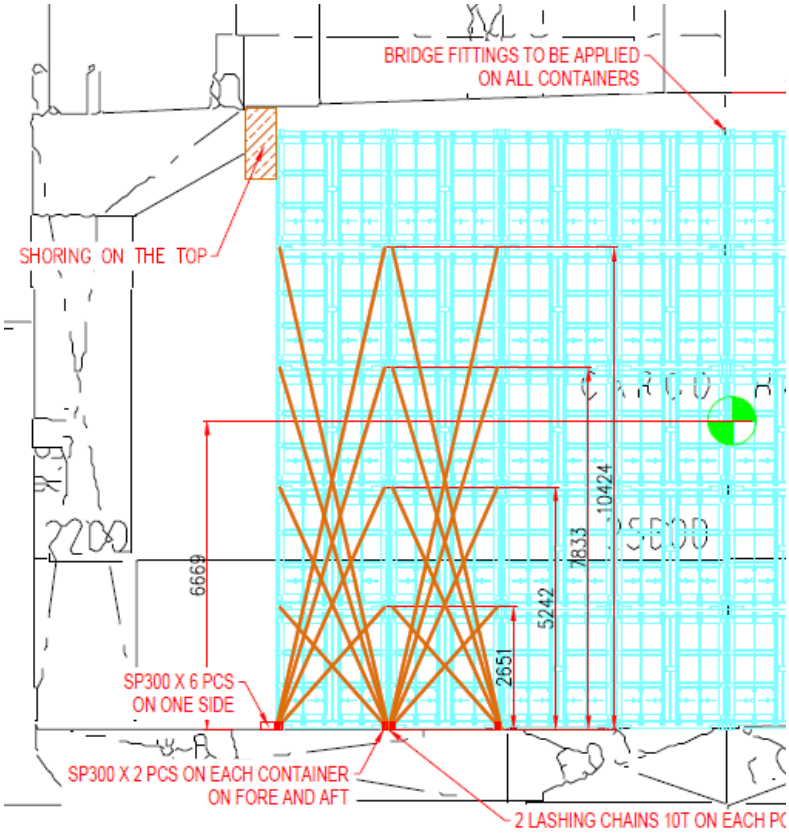
Penguin hook	Used as a supporting device in conjunction with a special lashing rod with an eye-end.		Likely to be put in place when a container is on shore because of difficulty in fitting when on board. Risk of injury if it falls out when container is lifted onboard.
Semi-automatic twistlock (SAT)	Placed between containers in a stack. Locks into corner casting above and below.		Resists horizontal and separation forces. Can be fitted on shore. Automatically locks into the lower container when placed on top. It is easier to determine whether it is locked or not when compared to manual twistlocks. Unlocked manually.
Twistlock	Placed between containers in a stack. Locks into corner castings above and below.		Resists horizontal and separation forces. Each fitting requires locking and fitting. Left and right-hand types exist, causing uncertainty whether a fitting is locked or open.
Stacking cone	Placed between containers in a stack. Slots into corner castings.		Resists horizontal forces. Many types exist. May be locked into bottom corner castings prior to lifting a container on board.
Double stacking cone	To link adjacent stacks, particularly those in line with buttresses.		Resists horizontal forces. More commonly used on con-bulkers below deck.
Bridge fitting	To link together the top of the containers of two adjacent stacks. Can be used on deck or in hold.		Resists tensile and compressive forces. Potential drop hazard for stevedores/crews during placement.

CONTAINER LASHING

H-beam stoppers and pad eyes are welded on tank top/hatch covers/deck for keeping containers in position and for chain lashing.

Wooden shoring is to be used between the top tier of containers and inner hatch coaming to prevent sideways movement of the container stack during rolling. Wooden shoring should be adequate size and strength and should have support to keep it in position during rolling of vessel and vibrations in adverse sea condition.

Any alternative arrangement to prevent sideways movement should not be accepted without office approval.



Twist locks or stacking cones are used between each tier of containers and bridge fitting on top tier between the containers.

Pad eyes are to be welded on tank top/hatch cover/deck for securing the containers using the rod or chain lashing.

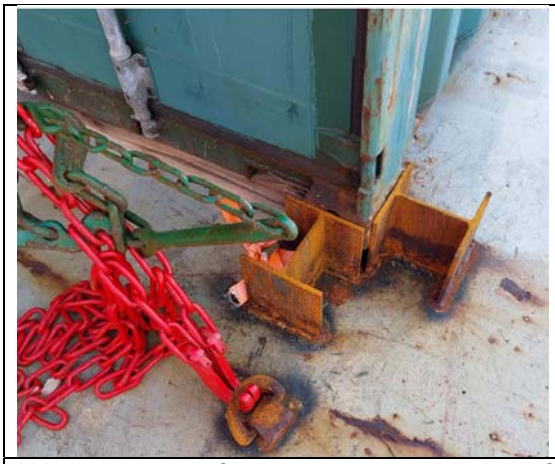
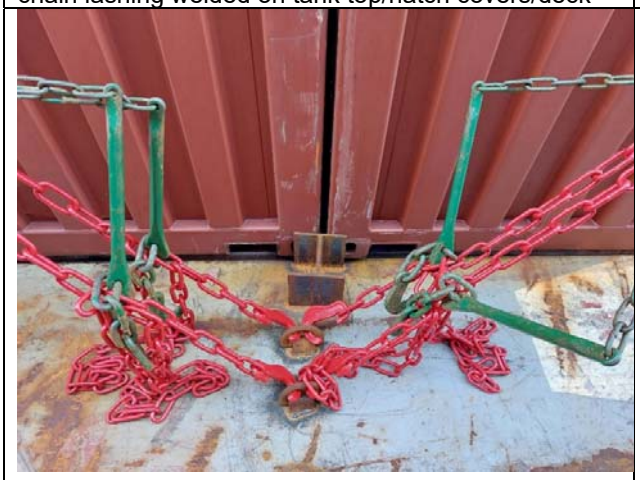
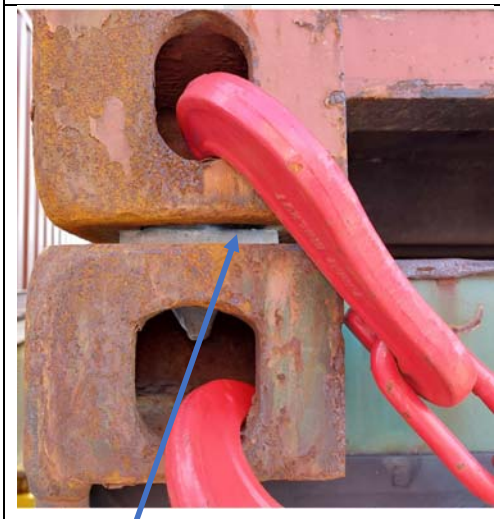
The container lashing plan as agreed with the charterer is to be followed.

All deck officers to familiarize with the agreed container lashing plan and lashing of other general cargo if carried. Lashing needs to be checked during loading for ensuring agreed lashing plan is being complied.

Inspect pad eyes foundations for proper welding. Aluminium ladders or an access should be provided to get the access to the container lashing in the cargo holds and two tension bars are provided for tightening the lashing during voyage if lashing rod and turnbuckles are used.

Ensure any welding/cutting for installing the stoppers and pad eyes is done at least 500mm away from the fuel tanks after hot work approval from office. Mark fuel tank boundary on tank top using general arrangement plan.

CONTAINER STOWAGE AND LASHING PHOTO:

	
H-beam stoppers for corners post and pad eye for chain lashing welded on tank top/hatch covers/deck	Wooden dunnage used for weight distribution
	
H-beam stopper welded between containers and tension levers	Chain lashed container on deck
	
Stacking cone between the containers in stack	Containers on hatch cover

BEFORE LOADING

Check the cargo description stowed in the containers as per the information provided by the charterer. The reefer containers are not allowed on board as there is no provision on board for power supply. The dangerous goods containers are not allowed on board without office approval.

Always consider personal safety when accessing lashing positions and working with lashing equipment. This applies equally in port and at sea. Charterer should provide the certificates for the lashing equipment.

Discuss and exchange information on the proposed loading with the charterer's representative / lashing supervisor to ensure that the proposed loading is not compromised with the ship's lashing system, loading requirements or stability.

Avoid loading heavy containers above light containers and at the top of a stack.

Check the shore lashing gang are provided with the container lashing plan.

On hatch cover and deck containers, containers within each stack are fastened together with twist locks or stacking cone. The containers are usually lashed to the ship's structure by diagonal lashing rods or chain lashing. The rods or chain are usually applied to the bottom corners of the second-tier containers. Check container lashing plan with the charterer or his representative.

DURING LOADING

- Do not stand or walk below containers that are being lifted. Twistlocks or other debris can sometimes fall.
- Examine containers for physical defects – check the corner posts carefully.
- Reject a buckled, twisted or damaged or damaged corner posts containers
- Check that containers have a valid CSC plate.
- Make sure container doors are closed.
- Check containers are being lashed as per container lashing plan e.g. using twist locks or stacking cones between the tiers, rod or chain lashing and bridge fitting on the top tier of containers
- Regularly check lashing components for condition and discard components that appear worn or are damaged.
- Check that mixture of fully automatic, semi-automatic and manual twistlocks in the same tier is not used.
- Regularly check container comer castings for wear at the twistlock and lashing rod or chain securing points. This is especially important when fully automatic twistlocks are used.
- Turnbuckle locking nuts should be fully tightened where used.
- When working on deck, always wear high visibility clothing, safety shoes and a hard hat.
- Always install temporary fencing and safety bars before starting cargo operations so that crew avoid passing through those areas.
- Never allow fittings to be thrown onto the ship's deck from a height.
- Never stand or walk under a raised container.

DURING VOYAGE

- Lashings should be checked and tightened within 24 hours after leaving port and regularly thereafter.
- Turnbuckle locking/check nuts or chain lashing should be fully tightened to prevent from becoming slack.

- Inspect and tighten lashings before the onset of bad weather. Pay particular attention to the forward and aft areas, and where vibration could cause turnbuckles/chain lashing to loosen.
- Do not overtighten lashing rods or chains. This can occur when lashing rods or chains are tightened during ship rolling because one side of crossed lashings will be less tight on the heeled side. Tightening on a roll can cause overtightening. Lashing rods can also be overtightened when a very long metal bar is used to tighten the turnbuckle. The lashings should be evenly tightened.
- Check for any visible damages of lashing.
- Do not open containers after they have been loaded. Closed doors are a component of the container's strength.
- Checking/tightening of lashing is to be recorded in deck logbook.
- When working on the top or side of a container, use safe access equipment and never climb containers.
- If working from a portable ladder, make sure the ladder is properly secured and has non-slip feet so that metal-to-metal contact is avoided.
- Take care when fixing penguin hooks or lashing rods if used, as these can slip and strike someone.

If you observe following:

- Any noise indicating cargo loose in containers. This can be heard by crew on deck, or crew on look out duties
- Bulging containers, indicating cargo loose in containers. Deformed sides affect the structural integrity of the box and its ability to support containers above. For boxes high up in the stow it affects the racking forces on the stow and lashing points.
- Liquid coming out of containers
- Shifted containers or loose chains or broken chains. Also loose bridging clamps
- Deformed lashing points
- Squeaking containers when the ship rolls, indicating loose lashings

Any of the above should be reported and investigated immediately

ENTERING CARGO HOLDS FOR CHECKING CONTAINER LASHING

- Carry out Risk Assessment for entering in cargo holds.
- Avoid entering in cargo holds during adverse weather/rolling/pitching. Adjust course and speed if required, any course alteration and/or speed adjustment for checking container lashing is to be recorded in deck logbook and reported to office and charterer.
- Comply strictly with the Enclosed Space entry permit.
- Keep natural vents open, ventilate hold using electric fans (avoid using these during rain/water spray)
- Arrange adequate portable lights
- Two persons should enter the cargo holds.
- Check access is safe to reach to the bar/chain lashing
- Comply with company enclosed space entry PPE matrix using walkie talkie & personal gas detector.
- Keep close contact with the standby person at the entrance.

HEAVY WEATHER PRECUATIONS

Company or charterer shall provide weather routeing service to avoid stormy sea.

During ship rolling, forces on container corner posts can be up to three times greater than the upright compression force.

If navigating in bad weather, adjust course and speed to avoid beam seas and proceed with caution until the adverse sea has passed.

Following actions which may be taken in heavy weather provided in Code of Safe Practice for Cargo Stowage and Securing:

Chapter 6

*Actions which may be taken in heavy **weather***

6.1 General

The purpose of this chapter is not to usurp the responsibilities of the master, but rather to offer some advice on how stresses induced by excessive accelerations caused by bad weather conditions could be avoided.

6.2 Excessive accelerations

Measures to avoid excessive accelerations are:

.1 alteration of course or speed or a combination of both;

.2 heaving to;

.3 early avoidance of areas of adverse weather and sea conditions; and

.4 timely ballasting or deballasting to improve the behaviour of the ship, taking into account the actual stability conditions (see also 7.2).

6.3 Voyage planning

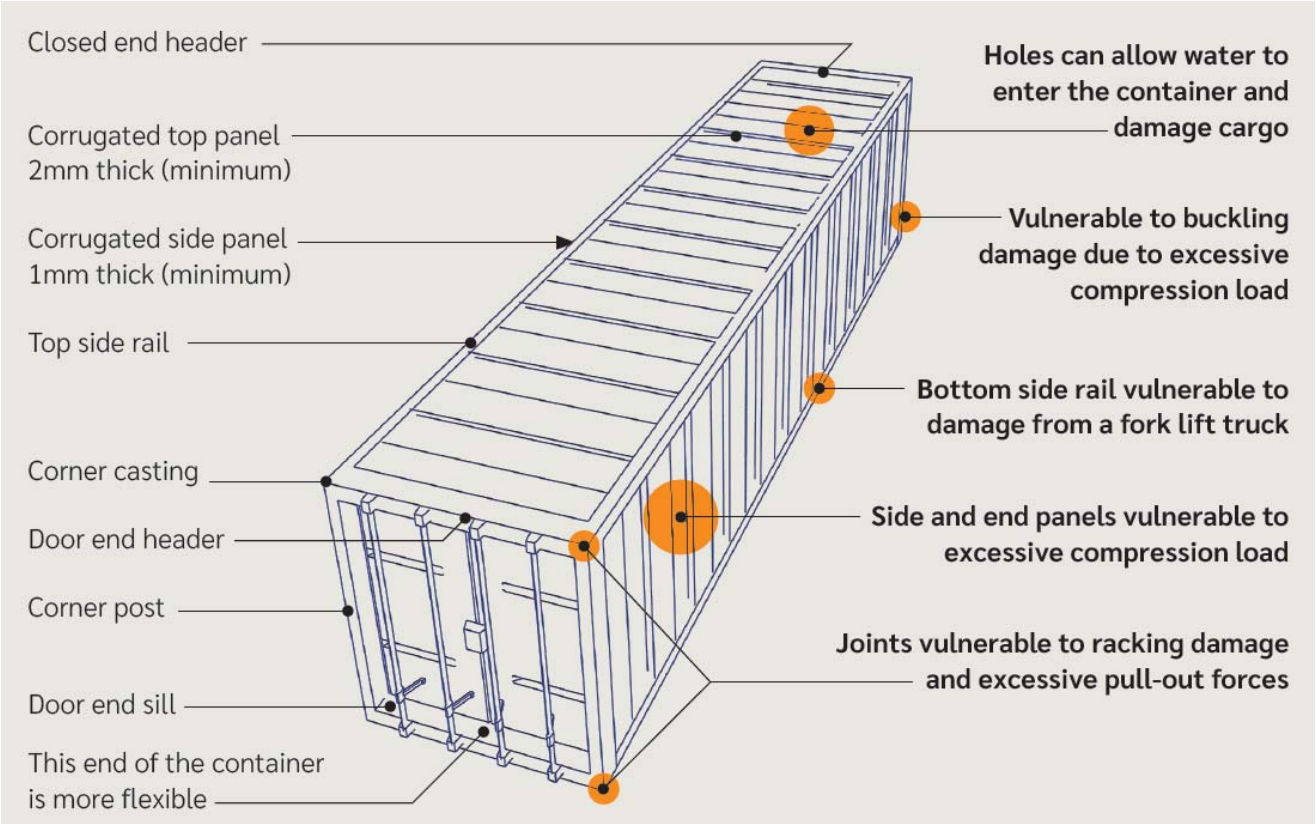
One way of reducing excessive accelerations is for the master, as far as possible and practicable, to plan the voyage of the ship carefully so as to avoid areas with severe weather and sea conditions. The master should always consult the latest available weather information.

CONTAINER CONSTRUCTION AND FAULTS

It is important to note that a container that has suffered damage to a corner casting or corner post will not be serviceable because:

- a damaged container may be unable to bear the weight of those stowed above it
- a damaged container may render lashings ineffective
- lifting a damaged container is hazardous

If one container in a stack fails, the entire stack will likely collapse.


Closed end header
Corrugated top panel
2mm thick (minimum)
Corrugated side panel
1mm thick (minimum)
Top side rail
Corner casting
Door end header
Corner post
Door end sill
This end of the container
is more flexible
Holes can allow water to enter the container and damage cargo
Vulnerable to buckling damage due to excessive compression load
Bottom side rail vulnerable to damage from a fork lift truck
Side and end panels vulnerable to excessive compression load
Joints vulnerable to racking damage and excessive pull-out forces


8"
CSC SAFETY APPROVAL
CSC No.
DATE MANUFACTURED
IDENTIFICATION No.
MAXIMUM GROSS WEIGHT
Kg
lb
ALLOWABLE STACKING
WEIGHT FOR 1.8g
RACKING LOAD TEST VALUE
END WALL STRENGTH
SIDE WALL STRENGTH
EXAMINATION
DUE DATE
7.625"

CSC Plate