

Risk Consulting - RCG413

# Reducing stock damage while in transit

This best practice risk control guide provides information and support in the area of prevention of cargo damage while in transit.

This guidance focuses on the controls to reduce risks to stock in transit from start to finish. It is focussed on shipping containers but can be applied to other Cargo Transportation Units (CTUs).

For details on security of stock while in transit – i.e. from theft – please read RSA's guidance [here](#)

## What might go wrong

There are several factors that may increase the risk of moving stock in containers over distance, such as:

- The nature of the stock – it may be susceptible to movement damage or be inherently vulnerable to contamination
- The distances travelled - the longer that stock is in a container the more at risk it is from impact damage and contamination. Particularly given the physical forces required when stacking, loading, offloading etc.
- Long sea crossings will mean wide ranging temperature fluctuations. This can cause condensation to form in containers
- Containers are likely to be stacked for long periods on or under other containers. While they are designed to be stacked like this, any damage to the container or those around it may worsen and have an impact on the stock inside
- Containers are likely to be lifted onto and off ships using cranes where there is a risk of being dropped or knocking into the ship, structures or other containers
- Loading into containers involves the use of forklifts and other plant equipment that may damage pallets or the container
- Intermodal transport routes put the stock at more risk. For example, switching from container to air freight may mean cargo is exposed to rain or humid conditions en route
- There is often a reliance on third party carriers who will also themselves rely on third parties. This makes it difficult to monitor compliance with checking protocols along the route.

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With this increased exposure to risk, cargo might be damaged for several reasons such as:

- Water ingress, either because it was brought in with the stock or the container has been poorly maintained. Water may also form as condensation where temperatures change enroute
- Pest or mould infestation due to the stock itself being already contaminated or through a poorly maintained container. Pest infestation is also more likely if water has found its way into the container
- Impact/ structural damage during transit or lifting can not only compromise the container itself but also harm the stock inside. Additionally, the damage may reduce the integrity of the container. Allowing water, pests, or mould to enter through any gaps in the body or via doors that cannot be securely closed. Theft clearly means a loss of stock, but stock can also be damaged or contaminated by the presence of intruders. The act of breaking into a container may increase the likelihood of water entering it, as the container is left compromised and unprotected
- Loss of temperature control – some products require to be stored and moved at set temperatures that may be disrupted enroute
- Inadequate or poor packaging/loading of stock meaning that it can move and fall within the container

Additionally, any such incident involves other impacts such as:

- Entire containers may be rejected even if only a few items within the stock show signs of being wet or contaminated, especially in the case of products intended for food or human use Delays in shipping as further checks may be required of other containers
- Reputational damage as receiving clients reject or miss their shipments or receive tainted stock
- Potential for stock of other clients to be damaged as a result
- Incurred costs of replacing stock, rebooking shipments etc. as well as potential penalties
- Time and cost of resources involved with handling the incident, checking the integrity of all the other stock in the container and investigating the cause of the incident

It is therefore important to ensure that stock in transit is not at risk of contamination at any stage from loading to unloading, where it is at its most vulnerable.

## How to reduce damage – check containers

The sound condition of the container (or any CTU) is key to the protection of cargo. Care should therefore be taken to include the following straightforward checks prior to loading a container:

- Ensure the container/CTU is in the structural condition that it should be. Fair wear and tear is to be expected but there should be no weakness to any part of the frame or the body of the container.
- It should also be weathertight with no holes or potential for moisture or pest ingress.
- Consider the use of approved fogging to disinfect and control microbial contamination
- Ensure the container is dry, clean and free of debris.
- Make sure there are no traces of previous loads remaining. Ensure that there is no presence of dirt, soil or water that could lead to pest infestation and stock contamination. Take and retain 'before and after' photos
- Ensure that stock within refrigerated trailers is safe from loss of power by checking the operability and maintenance records regularly

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- Ensure also that the refrigeration equipment fans/blowers are free of pests
- Ensure that the drain plugs of refrigerated trailers are securely closed. Ensure that the floor bars are clear of debris to allow airflow and that these areas are free of water as they are often subject to wash downs
- Containers should be adequately labelled to help reduce the risk of misdirected stock; Common Transit Convention (CTC)/Bureau of International Containers (BIC) code labels
- Ensure that the container/CTU lock mechanisms operate well, and can be secured in the appropriate manner to reduce the risk of theft or of tampering of stock
- Ensure that any strapping/blocking bars and lashing equipment are in good order
- Where there is doubt as to the integrity or cleanliness of a container, ensure it is either rectified or rejected accordingly
- Remember that the partial damage of stock may result in all stock being rejected by the recipient

## How to reduce damage – ensure correct packing

It is key to the integrity of the stock in transit to ensure that it is packed and loaded correctly. Damage due to incorrect loading or poor stability/load distribution can cause damage to much of the stock within a container/CTU.

Prior to loading, ensure that a formal packing/loading plan has been established and agreed.

Whatever method is used for stabilising stock, the following checks should be conducted:

- Ensure that cargo, packaging, pallets and boxes are always stored in dry, well ventilated, clean areas
- The packing/loading areas themselves should also be kept clean and clear of water, pests etc.
- Pallets should be to the ISPM-15 standard and be kiln dried/heat treated, or be of plastic build
- The timber in the pallets should not contain any more than 20% moisture by weight.
- It may also be worth using cardboard lining sheets on the top deck of pallets, to absorb any residual moisture from the pallets. This will help protect the products in direct contact.
- Products need to be securely contained within both the primary and secondary packaging, ensuring they do not shift or spill during transport, as this could compromise the stability of the whole load
- Ensure that boxes are not over stacked on pallets and are away from the edges of the pallet.
- Check that there are no unnecessary gaps between the boxes on the pallets as these can cause movement of boxes while in transit
- Ensure that cargo is stored the correct way up, and labelled accordingly
- Protective edge or corner angle boards may need to be used to protect boxes especially if double stacked
- Adhere to any specific manufacturer recommendations for movement and packaging of their products
- Where required, pallets should be double stacked with care and with the appropriate weight distribution
- Ensure that pallet wrapping is conducted in the correct staged manner and that wrapping and banding is not done too tight, so as to crush the boxes
- The size of each load should always be assessed to ensure there is no tipping risk while in transit
- Pallet stability can be tested prior to loading, in accordance with the appropriate standards

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- The use of tilt/shock indicators should also be considered
- Where loading Unit Load Devices (ULDs) for aircraft movement, use appropriate rain hoods and ensure stock remains dry while switching transport modes

Once boxes or pallets are ready, ensure that they are safely loaded onto the container for their journey:

- Take photographs of the condition of the stock and the container, to aid with any investigation in the event of damage enroute
- Ensure the container/CTU is appropriate for the load, and that weight loads are appropriate
- Ensure loads are correctly distributed within the container/CTU
- Take care not to stress the floor of the trailer or damage the container or load while loading with forklifts
- Load pallets/boxes such that they cannot slip, sway or move – consider friction risk, slip mats etc
- Minimise air gaps, or use protection to fill gaps (e.g. packaging, air bags)
- Use straps, lashing or blocking methods correctly and where appropriate – do not damage the cargo or overstress the trailer
- Ensure the container is adequately secured to the trailer
- Ensure that the trailer is adequately secured to the vehicle
- Pay special attention to power/temperature controls, internal height limits and drainage etc. in refrigerated units
- Consider the risk of moisture build up especially over long distances and use desiccant or water protecting solutions where required. Most containers will not have vents, but where in place ensure these are sealed up if using desiccant.
- Other measures may include lining the walls and floors of containers with kraft liner or other absorbent liners to prevent direct contact between the cargo and the container. Cardboard sheets or caps can also be placed over the tops of pallets to protect against dripping condensation on routes likely to be at risk.
- Wherever practical, consider abandoning the use of pallets in ocean containers in favour of slip sheet methods (though this requires slip-sheet handling equipment at both ends of the ocean voyage).

## How to reduce damage – double check the load

Once loaded, and before closing the doors, ensure that the container and contents are double checked and that it has all remained clean, dry and without faults/damage etc. while loading. Also conduct thorough final checks with the driver:

- Are the driver and carrier aware of the contents of the load
- Has the gross weight been confirmed as suitable
- Is the load stable and at no risk of movement within the container – voids filled, heavy boxes below lighter ones, pallets and boxes unable to slip etc.
- Has the load been suitably lashed down
- Are the correct reefer temperatures set where required, and drainage plugs replaced
- Has desiccant/moisture protection been placed where required
- Have photographs been taken of the loading stages and the final load
- Once checked ensure that the container doors are adequately secured and sealed, and number recorded

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## How to reduce damage – maintain compliance

It is essential to establish an audit compliance process with controls to assess their overall effectiveness, including those of third parties.

This should apply not only to your own business and operations but also to all other parties involved with moving the stock such as hauliers, shipping lines, storage facilities etc. Ensure that all such parties are known and that the suitable formal arrangements/contracts in place will be adhered to.

In addition, the use of agency drivers should also be well managed to ensure that drivers are suitably qualified, licenced and vetted.

Introduce a framework whereby training is formalised, procedures are documented, and checks are made regularly of compliance and effectiveness of controls, not just by your own staff but also those of third parties trusted with your stock.

## Further reading and links

- RSA's guidance on cargo security while in transit, visit [here](#).
- C-TPAT (7-point container inspection) <https://www.cbp.gov/document/guides/c-tpat-7-point-container-inspection-checklist>
- New, updated version released of "Prevention of Pest Contamination of Containers: Joint Industry Guidelines for the Cleaning of Containers" — World Shipping Council
- Best practice for the safe packing of shipping containers has now been codified by the International Maritime Organisation (IMO) in the form of the "CTU Code", which can be downloaded [HERE](#).
- Details of the CSC code - [The Container CSC Combined Data Plate Explained | BIC \(bic-code.org\)](#)
- Further information on the ISPM15 heat treatment of wooden pallets - [ISPM15 - Let us give you some advice](#)
- ISO 6346 - Shipping Container Standard. ISO 6346 is an international standard which describes the identification of a shipping container
- [EUMOS 40509 - Test method for load unit rigidity](#)
- EN 12195 - Load restraining on road vehicles. Safety - Calculation of securing forces
- ISO 27956: "Securing of cargo in delivery vans -- Requirements and test methods"

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