

6 Transport...

6.4 Maritime Shipping



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IMPORTANT NOTICE!

A general guide cannot take into account the specificity of all products, procedures, laws and regulations. We therefore recommend that this guide be used only as a complement to information from suppliers, whose safety, operating and maintenance procedures along with applicable local legal regulations always take precedence over this guide. This guide is and is intended to be a presentation of the subject matter addressed. Although the authors have undertaken all measures to ensure the correctness of the material, it does not purport to list all risks or to indicate that other risks do not exist. The authors, contributors, the represented associations and participating companies do not give any guarantee thereof and no liability is assumed by reason of this guide as it is only advisory in nature and the final decisions must be made by the stakeholder. It shall not be applied to any specific circumstance, nor is it intended to be relied on as providing professional advice to any specific issue or situation.

⚠ Always check machine is in its specified safe position before working on any component (e.g. with compressed air, electrical power and gas disconnected). Only trained maintenance personnel adhering to safety regulations should perform maintenance work.



Best Practice



Poor Practice



Safety Issues



Environmental & Economic Impact

Types of Vessels



The Yantian Express at the container terminal in Hamburg. Source: Hapag-Lloyd.



Feeder container vessel. Source: IF P&C.



General cargo ship. Source: IF P&C.



Paper rolls stowed on deck. Source: Intakt.



Cassettes of paper in cargo hold. Source: Intakt.

Container Ships

There are three types of vessel that carry containers — feeders, Panama and post-Panama. Feeders are the first and last link in the sea transportation chain of containers. These ships are used for transporting containers to and from smaller ports that bigger vessels cannot enter. Panama and post-Panama vessels transport containers over the oceans between large harbours. Container capacity is measured in TEUs (Twentyfoot Equivalent Units). Panama vessels are still small enough to pass through the Panama Canal and can carry around 5000 containers. Post-Panama vessels are ships that can carry up to 20 000 containers. These are too big for the Panama Canal.

Containers

Dry cargo containers are widely used for water as well as land transport of paper. Containers initially seemed to offer unlimited advantages for transporting paper products. However, it has become increasingly difficult to organise smooth container transport because homogeneous cargos are becoming less common. Sizes of cargo units are extremely variable, e.g. sizes and weights of paper rolls rarely coincide with container dimensions. Containers are addressed in detail in Module 6.3.

General Cargo Ships

These ships are built for carriage of a vast variety of goods from forest products to non-standardised project cargoes. The cargo holds of these vessels accommodate both containers and assorted other cargo.

LoLo (Lift-on Lift-off) cargo is moved either with the ship's own cranes or with harbour equipment. The cargo can be lifted straight into its place or with the help of forklifts or clamp trucks in the cargo hold.



A Roll-on Roll-off vessel. Source: Intakt.



Cargo being driven on to a Roll-on Roll-off vessel. Source: Intakt.

RoRo (Roll-on Roll-off) Ships

RoRo cargo is loaded on wheeled units that are driven or pushed/pulled on board. Paper and pulp is loaded onto roll trailers and cassettes that are towed by a special vehicle driving on/off the ship's stern ramp. Other cargo can be stowed on different types of transport units alongside transport vehicles and containers. This means loading and unloading is rapid. However, the empty space (broken stowage) between cargo units reduces carrying capacity and the ship must use all of its available cargo space for the voyage to be economically viable.

StoRo (Stowable RoRo): Cargo is brought onto the vessel on wheels and is then stowed on the decks. This technique increases the space utilisation rate by increasing the stowage height and reducing broken storage space.. The stern ramp or side ports are used to load the cargo with clamp trucks, forklifts, Tugmasters and MAFI trailers/cassettes. Loading may be on any deck from the weather deck down to the tank top. However, loading on the weather deck always requires approval of the shipper and sensitive cargo must always be transported under the deck. StoRo cargo will include paper or board in rolls and pallets, copy paper pallets, pulp bales, plywood or timber packages, and others.

Side port ships (also known as elevator ships) are StoRo vessels that are loaded via side ports with elevators.



Cargo being driven on to a Roll-on Roll-off vessel. Source: IF P&C.

Barges

The term barge covers different floating vessels. They usually have a low draught, minimum clearance above water line and generally have no lifting equipment. Types include:

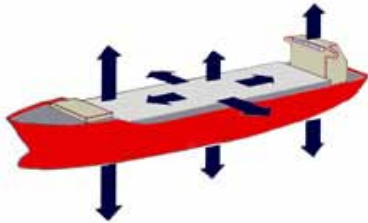
- Unpowered 'dumb' floating vessel (lighter) that is intended to be pushed or towed.
- Lash barge for sea transport. This vessel is taken by the mother ship to transport cargo in shallow waters to the final port of destination.
- Powered vessels for inland waterways like canals and rivers (such as the Rhine, Rhone, and Seine) with low freeboard (minimum clearance above water line).
- Powered coastal vessel.

The securing of cargo, particularly in the case of lash barges, takes place according to the requirements for seagoing vessels.



Barge. Source: IF P&C

Loading



Stresses on seagoing vessel.

- Rolling
- Heaving
- Vibration
- Pitching
- Heeling
- Shearing

Source: FMS Use No Hooks p60



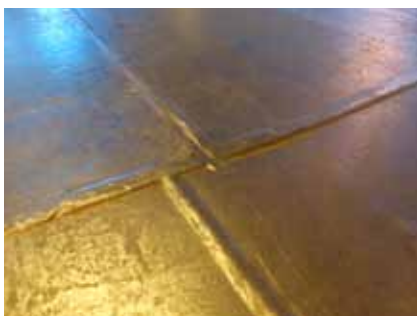
Wet cargo hold.

Source: FMS Use No Hooks p67.



Uneven cargo hold.

Source: IF P&C.



Welded floor seam in hold. Source: UPM.

The stresses of sea transport pose a particular challenge to the safety of the cargo units and cargo securing measures. Bad conditions at sea mean that cargo can be subjected to brief peak loads and repetitive stresses from the rolling motion of the vessel that can impact on the cargo for days.

Therefore, the goods must be loaded correctly to avoid damage during shipment. The quality of loading operations substantially depends on the experience and knowledge of all those involved. Loading operations can be jeopardised if one of the participants is not at a competent level.

Cargo Handling Procedures

- Inspect vessel before loading begins — see below.
- Cargo is correctly stowed and secured. Minimise condensation by using moisture absorbing materials and ensure the correct functioning of air dryers, ventilation and drainage.
- Correct handling equipment and techniques are used for unloading/loading.
- Clarify in advance under what weather conditions unloading/loading operations must be stopped. Observe the weather conditions during loading/unloading and do not allow rolls and pallets to be exposed to rain, sleet or snow.
- If handling damage occurs then follow the set procedures — are these communicated?
- Stevedores should follow the loading plan under the supervision of the vessel's officers and personnel. The maximum load capacity of the cargo decks should not be exceeded. Therefore, it is important to stow according to the stowage plan and designed weights. Stow one order at a time according to the diameters. Rolls must be stowed tightly nested together in StoRo and LoLo loading.
- If there are rolls with different diameters in the same pile/tower, the larger diameter rolls must be on the top to prevent smaller diameter rolls moving.

Inspection of Cargo Spaces

The vessel's holds must be inspected before starting every loading operation, including:

- The cargo space is dry and clean without residues of previous cargoes and unsuitable substances such as oil or odours that can contaminate paper. Hatches and coamings are free from cargo residues.
- Decks (and any repairs) are sound, smooth and even, without pits or holes, have smooth welding joints, and no protruding objects such as bolt heads. An even floor without any deformations in the deck is particularly important for the horizontal transport of paper rolls.
- No loose paint or rust particles in the holds and the sides are rust free and clean — this is particularly important for pulp.
- Manhole hatch cover bolts are below deck level.
- Timber and board used for covering cargo space walls must be intact and suitable for loading (smooth surfaces without protrusions).
- The vessel's ventilation and air drying units are in good working order.
- Lighting inside the holds is adequate.
- The cargo spaces are watertight.
- Hatch covers and seals are watertight. The hatch covers may have to be sealed by additional measures.

Loading capacity of cargo decks is the responsibility of the ship's officers.

(For container inspection Module 6.3.)

After inspection, and before starting the loading operations, clear instructions must be given on if and how, protective paper or board will be used in cargo decks, or if other protection is required; instructions to be given by the person in charge of loading.



Extra care is required when loading in wet or snowy conditions. Source Intakt.

Winter/Nordic Conditions

When shipping paper products it is very important to ensure that no wet or snow covered RoRo units (trailers, machinery) are accepted to be loaded next to paper StoRo cargo without careful cleaning and protection barriers between them (foam and sawdust on deck). Melting snow on top of curtain trailers produces large volumes of water that can directly cause massive wetting damage to paper cargo. It is important to take this issue into account when preparing the stowage plan and, where possible, avoid RoRo units and paper to be loaded on the same deck. In addition, it is recommended to use protection paper under the StoRo rolls during wet/winter season due to condensation and to avoid water damage.

Cargo Care While at Sea

Condensation on cargo occurs frequently in the winter when paper rolls are stored and loaded in a cold climate and then transported to countries with a warmer and more humid climate. If the vessel's cargo holds are ventilated with air of a higher dew point than the temperature of the cargo, the airborne water vapour condenses, leading to water droplets on the rolls. Condensation continues until the surface of the rolls reaches the same temperature as the dew point of the air. Vessels used for longer voyages should be equipped with adequate ventilation and dehumidifier units to keep the air dry even when the temperature rises.

In addition (to using air dryers) it may be necessary to change the air inside the cargo holds to increase the temperature of the cold cargo. The condition in the cargo holds must be closely monitored during this kind of operation. Extra care must be taken when loading extremely cold rolls, as frozen rolls significantly increase the risk of condensation during voyages to warmer climate.

To be checked during voyage:

- Ventilation and air dryer (check with hydrometer and thermometer)
- Lashings and cargo movement
- Leaks of bilge valves and deck hatches.



Roll damage from a wet and rusty vessel floor. Source: UPM.

RoRo (Roll-on, Roll-off)



Rolls on a cassette being reversed onto the ship by a Mafi tractor. Source Intakt



Roll trailer. Source: IF P&C.

Cargo Transport Units (CTUs)

Roll Trailers: These unsprung trailers are also called MAFI trailers (after the manufacturer's name of the towing vehicle). Trailers are loaded prior to the arrival of the vessel. The cargo needs to be secured with the utmost care because RoRo vessels navigate all shipping routes.

Cassette: A loading platform without wheels. A wheeled translifter is placed underneath the platform that is then lifted to be transport between the ship and the port warehouse.

Inspection of Roll Trailers and Cassettes

The condition of the roll trailers/cassettes must be checked before loading starts. Their deck must be clean, dry, free of protruding objects such as bolt heads, smooth, free of oil stains and debris and have no holes. The lashing points must be in good condition and the wheels and tyres inspected for damage.

Loading/Unloading Cargo onto CTUs (Cargo Transport Unit)

Do not exceed the payload of the roll trailer/cassette! It is important to take into account the vessel's lifting platform capacity and the deck's maximum mass limitation (kg/sq m) — this is the responsibility of the ship's officers.

The height of the vessel's hold (although not usually a limiting factor) needs to be taken into account in stowing the roll trailers/cassettes.

To maintain stability the cargo height should not exceed 3,5 m (11,5') except for Super Jumbo rolls. Paper pallets can normally be loaded 2-high, sometimes 3-high.

Rolls with a diameter of less than 900 mm (35,5") should be unitised on RoRo or into containers.



A fully loaded cassette is being pushed into the ship by a Tugmaster. Source: Intakt.

⚠ To avoid damage cargo should not overlap the roll trailer/cassette edges. Use warning stickers if the load exceeds the trailer width.

✅ If different types of units are loaded on the roll trailer, the lighter units must always be loaded on top of heavier ones. Stowage must be as tight as possible.

When loading paper pallets in more than one layer, plywood boards must be used between the layers to prevent damage and to stabilise the load.

The load must be built as evenly as possible. To avoid lashings damaging the centre unit packages of different sizes must be arranged so that the highest part of the stow is along the centre line.

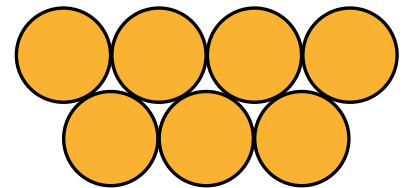


Plywood boards must be used between layers of pallets. Source: Intakt.

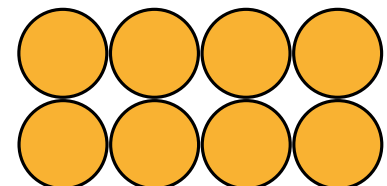
Roll Stowage

Rolls are always stowed in vertical position.

- **< 800 mm (31,5") Ø rolls:** Load in a soldier pattern, leaving a gap in the centre of the load to enable horizontal lashing in two blocks. Lashings are identical on both sides. The width of the roll trailers/cassettes permits the loading of 3 rolls across and 15 rolls lengthwise [40' trailer].
- **< 1200 mm (47") Ø rolls:** Load in soldier pattern in contact with each other. The width of the loaded unit is 2 rolls across and 9 rolls lengthwise. The lashings are identical on both sides.
- **1250 mm (49") to 1700 mm (67") Ø rolls:** Loaded in nested pattern on the roll trailer/ cassette to optimise payload. The lashings are not identical on both sides of the unit. Chains must be placed on the rolls on the supported parts of corner profiles.
- **>1700 mm (67") Ø rolls:** Load in the centre of the roll trailer/cassette.
- **Jumbo rolls:** Loaded in two or more blocks on roll trailer/cassette. Do not load them in a row on the centre line as they would start swinging when the vessel rolls.



Nested



Soldier



Rolls secured with WISA-Fix tarpaulin. Source: Intakt.



Incorrect edge protection. Source: IF P&C.



Strips of wood as edge protectors.
Source: FMS Use No Hooks p 75



Cargo securing tarpaulins.
Source: IF P&C.

Cargo Lashing and Securing on CTUs

❌ Incorrect securing will damage paper in rolls or palletised sheet paper.

Cargo is often only secured by lashing down. Parts of the cargo are secured with textile straps and a ratchet system. Depending on the type of ratchet system used, considerable force is exerted on the cargo, which can cause damage.

✅ Prevent damage by using generously dimensioned edge protectors to distribute the forces evenly over the cargo and protect its edges.

⚠ The use of self-made edge protectors of nailed strips of wood is not recommended as these are unable to withstand the applied forces over long periods of time.

The cargo must be strongly secured on roll trailers/cassettes to ensure that it does not move during the sea voyage. Chains, corner profiles, boards and WISA-Fix tarpaulins can be used with cargo belt lashing. Different equipment is required for different cargoes. The basic method of lashing the load is to tie it down onto the platform with belts or chains strapped over the load. The upper corners must always be protected with the corner profiles. The tightening is made from the top of the load.

Horizontal lashing belts are used to prevent packages from falling or moving by tightening the packages together into blocks.

⚠ When paper pallets are stowed in more than one layer, use plywood boards between the layers as a support to protect the tops of the lower pallets from damage. It is extremely important to use boards when stowing copy paper pallets. The boards should not exceed the sides and ends of the trailers/cassettes.

Stanchions are used at the ends of the unit, together with a vertical plywood sheet.

The use of WISA-Fix tarpaulin is recommended for a variety of commodities. These can provide good results for securing cargo; however, incorrect use of tarpaulins can lead to damage to the edges of the cargo.

Cargo securing tarpaulins are expensive and only economic if their return is guaranteed. To secure trailers on seagoing vessels ensure that the sling chains are attached only to the points on the trailer provided for this purpose.

⚠ Under no circumstances must chains be tightened over the cargo.

✅ Corner profiles should always be used to protect the upper corners. Long profiles should be used if possible. When horizontal belts are used in lashing paper pallets, corner profiles must be used at the corners.

When lashing palletised cargo, the lashing chains must be placed in the centre of the package with at least one chain for every pile, particularly when there are two or more layers. Chain lashings must be placed over the roll, not on the unsupported part of the corner profile. This is particularly important if the stow has more than two layers. Chains used in securing the cargo should be placed in such manner that they do not exceed the edges of the RoRo unit.

Pieces of walking board must be used under the tension levers to prevent damage to the tops of the pallets and rolls.

Loads of small rolls should be stowed on the platform so that they can be tied together with horizontal belts to form blocks.

Stability of jumbo rolls is increased by horizontal web lashing.

Lashing and Securing CTUs on Board

After the cargo has been secured on the RoRo unit, it is carefully taken on board and secured to the deck of the vessel. If the securing becomes loose during loading, it must be retightened before departure. RoRo units must be secured firmly enough to the deck to take the forces from the vessel's movements in all directions. Where possible, it is advisable to place units with the same cargo next to each other. RoRo units may be secured either in lanes, or by block stowage (cassettes only).

▲ MAFI tyres can break and flap around during transport in the terminal and can damage the cargo. Recheck the securing measures to ensure that no settling of the cargo has happened.

Lane stowage: Traditionally, roll trailers are pushed on board in lanes with a small space between them to allow securing to the deck with chains. The lashing is made from the unit to the deck between the lanes. The stability of the roll trailer can be improved by securing the load from the top to the deck above with a top lashing. Attach a small hook to the cargo lashing chain on the RoRo unit, and then crosswise lash the chains (of the top lashing) to suitable fittings of the deck above. Another way to improve stability is to attach extra lashing from the deck above over the load to deck lashing points — use chains as short as possible fitted diagonally to the deck fittings.

Tightening of the securing chains can be done manually, or more efficiently with a pneumatic tool compatible with the tightener. Rubber mats should be used between the units and the vessel deck. The securing should be checked and tightened.

Block stowage: This is normally made using specifically designed cassettes that are stowed next to each other and secured to the deck only from the ends and from the side of the last unit of the row. The building of the blocks begins from the sides of the hold. The first unit is stowed in contact with the side, the next in contact with the first unit and so on. The large block that is formed is tied to the side of the vessel.

Stability can be improved with top lashings. A lashing from the side of the vessel is extended around the corner of the large block to the deck. Another method is to extend the lashing from the cargo lashing chains to the deck above. Containers on cassettes or roll trailers can be used as protection on the other side of the block. To prevent damage to goods special care must be taken with different heights of roll trailers.

Unlashing and Discharging of RoRo Units

✓ Remove with care all lashings (securing chains, tension levers, etc) to avoid damaging the cargo on the units. Discharging a RoRo vessel is in the reverse order to loading. The onboard securings are removed; the units are pulled ashore, where they are unlashed. After unlashing, the RoRo units are discharged and the cargo is sorted in the warehouse.



*Cassettes must be firmly secured to the deck to resist the forces from all of the vessel's movements.
Source: Intakt.*

StoRo (Stowable RoRo)



Securing of timber packages with lashing belts.
Source: IF P&C.



Correctly use of airbags with a StoRo cargo.
Source: IF P&C.



Step-down securing of StoRo cargo.
Source: Stota-Enso.



StoRo cargo secured with Wisa-Fix. Source: Stota-Enso.

Cargo is brought onto the vessel on wheels and is then stowed on the decks. The stern ramp or side ports are used to load the cargo with clamp trucks, forklifts, Tugmasters and MAFI trailers/cassettes. Loading may be on any deck from the weather deck down to the tank top. However, loading on the weather deck always requires approval of the shipper and sensitive cargo must always be transported below deck.

✓ StoRo Loading/Unloading

Before loading the following points should be checked with the ship's officers and stevedores:

- Going through the loading plan so that everybody knows how and where cargo is intended to be loaded.
- Cargo holds are in suitable condition for StoRo loading, i.e. clean, dry and without any unevenness.
- Identify need for protective measures such as paper, walking boards, soft board, sawdust and urethane.
- Define weather conditions when the loading needs to be halted.
- Condition of the handling equipment being used.

Lashing, Securing and Cargo Protection

Lashing and securing materials must be appropriate, in good condition and used correctly to avoid damage or staining the cargo.

Rolls and pallets should stay in their positions during the sea voyage. The rolls should be loaded in a nested pattern to optimise space utilisation and cargo safety. Pallets should be loaded tightly against each other and empty spaces should be filled either by blocking or with the use of airbags.

There are many ways of securing the last tier. WISA-Fix tarpaulins can be used for lashing the rolls. It should be installed at the top of cargo hold and the other end secured to the deck. Every layer of rolls or pallets at the end tier can also be lashed with horizontal lashing belts.

Step-down securing should be used whenever possible. In this method the final tier should be secured with belts and corner protection by securing every single column with a belt fastened to the roof and the deck. When securing the cargo like this, it is important to finish with rolls that can lock the previous tiers.



Intakt unload cassette StoRo

Side Port Vessels



Rolls being loaded via a side port. Source: Stora Enso.

StoRo cargoes can be loaded or discharged by using either the stern ramp of the vessel, or its side ports with elevators. The side ports have a conveyor system and lifts serving the tween deck and lower hold. Clamp trucks position rolls on to the loading platform where a conveyor moves them on to the elevator. When the elevator reaches the desired deck level, the cargo will again be automatically moved to conveyor into the hold allowing clamp trucks to pick them up and place them into their final stowage position.

The unloading is conducted in reverse order.

Before Handling Rolls/Pallets Check:

- ☐ Condition of clamps/forks and their safe working load.
- ☐ Clamping force is as specified on the label of the rolls to be handled.
- ☐ Check slats of the conveyor elevator system are not faulty — they can damage roll ends.
- ☐ As rolls are moved ashore by clamp trucks, ensure that:
 - The trucks can reach the rolls unhindered by surface unevenness (rails, cable ducts, etc.).
 - For elevator operation, the vessel is located close enough to the quay wall (check fender dimensions) so that the trucks are able to pick up the rolls unhindered.



Rolls are moved from elevator to conveyor. Source: Stora Enso.



Precise final roll stowing in StoRo hold. Source: Stora Enso.

Loading/Unloading of Pulp

The maximum loading height is four bales high. Step-down securing is the best method using horizontal belts or Wisa-Fix tarpaulins.

- ☒ Special attention should be paid to prevent contamination, i.e. no plastics, wooden particles, nylon ropes, stones, etc.

Rolls on sideport conveyor. Source: Stora Enso.

LoLo (Lift-on, Lift-off)



Mobile hydraulic harbour crane loading a LoLo vessel. Source: Stora Enso.

Loading Planning

Efficient planning requires the main parties (stevedore, ship's personnel, quay cargo-handling operator, forwarding agent, etc.) to agree on the type and volume of the load. All issues should be discussed in advance to identify appropriate solutions, from dealing with bad weather conditions through to quantity and unit dimension variations. Overloading, cargo securing and the choice of cargo handling and loading equipment are the main challenges. In order to avoid these problems, the parties can agree on a standard checklist for advance clarification of the most important issues (see checklist example opposite).

Roll Loading, Stowing, Lashing and Securing

Rolls should be stacked in nested formation to optimise space and cargo safety. The nested pattern locks rolls with each other, preventing them from moving during the sea voyage.

It is important that all loading equipment is in good order so that there is no risk of damaging the cargo during the loading operations. Timber can be used under the rolls to minimise the risk of wetting to the roll ends through condensation. Airbags should be used on the top layer for securing the load.

Pallet Loading, Stowing, Lashing and Securing

Ship movements can be quite violent during a sea voyage. This requires special care to the height, stability and integrity of the bottom layer of the cargo: high stacks can easily become unstable or the bottom layer damaged. Plywood walking boards should be used between the layers of pallets. Airbags should be used on the top layer for stabilising and securing the stacks.

- ✓ When handling pallets, ensure the equipment is clean and that the pallets are not damaged by the lifting forks or other machinery.

Loading/Unloading of Pulp

Special attention should be paid to prevent contamination (from water, plastics, wood particles, nylon ropes, stones, etc.).

- Protective tarpaulins, or papers, must be used to completely cover the tank top/cargo hold walls if they are in a poor condition (rust, loose paint and previous cargo residues, especially in the winter time).
- If sawn timber or plywood is carried in the same hold, pulp must be completely covered with tarpaulins.
- Pulp bales should be loaded and lowered on a platform or steel plate alongside the vessel to prevent contamination from sand and stones.



LoLo stowage and dunnage. Rolls being stowed into the hold of a LoLo vessel — the deck has timber dunnage to avoid direct contact with the deck. Source: Stora Enso.



Poor stowage in general cargo vessel. Source: FMS Use No Hooks p66.

Checklist for Lo Lo loading Please complete a checklist for each cargo and each ship

1. Cargo (to be completed by forwarding agent)

Item No: _____
 Contact partner: _____ Telephone: Office: _____ Mobile: _____
 The following cargo is ready for shipment
 Number: _____ Type: _____ Weight: _____
 Sheds: _____ M/S: _____ eta: _____
 eta: _____
 Photos: ☐ yes, ☐ no Photo report: Photos: ☐ yes, ☐ no
 Loading arrangement: ☐ vertical ☐ horizontal ☐ yes, ☐ no
☐ horizontal in sling
 Miscellaneous: _____
 Delivery conditions: _____
 Right of disposal: _____
 Peculiarities: _____
 Date: _____

2. Terminal (to be completed by quay operators)

Contact partner: _____ Telephone: Office: _____ Mobile: _____
 Loading times: from date: _____ Time: _____
 to date: _____ Time: _____
 Number/Operations: _____
 Peculiarities: _____
 Date: _____

3. Ship (to be completed by ship broker)

Contact partner: _____ Telephone: Office: _____ Mobile: _____
 Name of ship: _____ Year of manufacture: _____
 Is the ship presently suitable without restriction for the aforementioned goods and does it comply with the currently applicable regulations?
☐ yes, ☐ no for the following reason: _____
 Is an advance inspection possible? ☐ no, ☐ yes from date: _____ Berth: _____
 Contact partner: _____ Telephone: Office: _____ Mobile: _____
 May photos be taken? ☐ yes, ☐ no
 Hold number(s) and probable slot: _____/_____
 Understowage: ☐ yes, ☐ no Cargo: _____
 Overstowage: ☐ yes, ☐ no Cargo: _____
 Foreign cargo in direct contact with aforementioned goods? ☐ yes, ☐ no
 Can a stowage plan be requested for the ship? ☐ yes, ☐ no
 If no, size of cargo holds: Length: _____, Width: _____, Height: _____
 Peculiarities: _____
 Who is responsible for cargo securing? _____
 Who provides lashing material? _____
 What lashing material is available? _____
 Has lashing material already been used? ☐ yes, ☐ no
 Are wooden pallets available? ☐ yes, ☐ no
 Peculiarities (hatch cover, crane assistance, etc.): _____
 Date: _____

4. Stevedores (to be completed by stevedores)

Contact partner: _____ Telephone: Office: _____ Mobile: _____
 Does information from parts I and II correspond with information provided?
☐ yes, ☐ no Following variations were noticed: _____
 Loading devices suitable for the goods available: ☐ yes, ☐ no
 Other remarks: _____
 Date: _____

5. Survey (to be completed by inspector)

Item No: _____
 Contact partner: _____ Telephone: Office: _____ Mobile: _____
 Employee on site: _____ Telephone: _____/_____
 Date: _____

6. Special notes _____

When all issues on the checklist have been clarified, loading operations should commence in the presence of a competent representative of each of the companies involved. Frequent problems are:

- The cargo has not yet been delivered in full.
- The planned stowage locations do not comply with the requirements.
- The cargo hold is not swept properly.
- Cargo residues are present on the hatch frame(s).
- Large amounts of water fall into the hold when the cargo hatches are opened.
- The hatches cannot be closed quickly enough when it starts to rain.
- Contrary to agreement, work continues in rain or snow.
- The cargo is not stowed properly.
- Forklift drivers are inexperienced in handling the cargo.
- Cargo handling equipment is unsuitable for the product.
- Contrary to agreement, the cargo is over-stowed with other cargo.
- Contact partners are unavailable or do not have the necessary competence.

If the conditions vary considerably from those agreed, then loading should be stopped until clarification is provided.

LoLo Cargo Handling Equipment



LoLo operation by Mantsinen. A mobile hydraulic crane equipped with clamps for roll loading. Source: Stora Enso.

Clamps

Head clamp: A scissor action lifting equipment positioned on the end of a horizontal roll — when it is lifted it grips the load like a pair of scissors. The amount of pressure exerted by the contact plates depends on the roll weight. Different types are available for various roll diameters. These can be varied within their specific operating range to fit individual roll diameters.

Antwerp clamp: Uses a similar scissor lifting action — it presses itself against the roll via guided pull chains. To increase the handling capacity, several clamps are attached in a row to a single girder or in two rows to the frame girder. The girders are provided with holes. The clamps are positioned in the holes with shackles depending on the roll diameter. This clamp is unsuitable for handling jumbo reels.



Antwerp clamp. Source: FMS Use No Hooks p 67



Head clamp. Source: IF P&C.



Antwerp clamp. Source: FMS Use No Hooks p 127



Frame girder. Source: FMS Use No Hooks p 127



Antwerp clamp, off-centre. Source: FMS Use No Hooks p 128



Excentric load. Source: FMS Use No Hooks p 128



Vacuum clamp. Source: FMS Use No Hooks p 129

✓ Preconditions for smooth cargo handling using head clamps are:

- Roll packaging is undamaged and tightly wrapped.
- Clamp positions in the holes are at an exact distance to the slots for loading and unloading.
- The heavy head clamp is placed slowly on the end of the paper rolls.
- The clamp is centred above the roll core.
- The load is initially lifted after the safety mechanism has been completely released.
- The crane does not lift the cargo abruptly.
- The heavy contact plates of the Antwerp clamp are placed slowly (not thrown) on the ends of the rolls after being released.
- The pull chain guide is centred above the roll core and the rolls are vertically suspended.

Vacuum clamp: Large rubber “cups” are positioned on the ends of vertical rolls and a suction vacuum is created between the cup and roll. To prepare a roll for vacuum clamping its packaging must be open around the roll core and the vacuum cup must be exactly centred above the roll. An optical system tells the crane driver when the appropriate vacuum has built up for all rolls.

Slings

Jensen sling: Rarely used because of increased roll size and volume. The paper rolls are stowed in blocks and a frame-rope winch combination lowered above the rolls. After releasing the locking mechanism, the sling is pulled tight and the rope winch system tightened around the roll block to lift the load.

Endless slings: Used only for horizontal loading. The rolls hang horizontally in the sling and are not placed above the roll edge. Straps must be clean, dry and free of oil, etc. Specify if the straps are to remain attached to the rolls or should be removed prior to shipment.



Jensen sling. Source: FMS Use No Hooks p 130.



Endless slings. Source: FMS Use No Hooks p 130



Transport cage. Source: FMS Use No Hooks p 129

Transport cage

Often used where no special handling equipment is available. The transport cage must be clean and undamaged. Before lifting loads by crane, the safety chain must be attached to ensure that no reels can fall out of the cage.