Stora Enso

Cargo Handling and Securing Manual

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Changelog 3rd revision

In addition to the listed changes, various sections have been refined for clarity and wording improvements throughout the document.

Chapter 1

- Removed reference to the *Stora Enso eLogistics* app.
- Added requirement that suppliers must report **any and all safety incidents** to Stora Enso.

Chapter 2

Chapter 2.2.8

- Updated safety measures applicable to warehouse operations.

Chapter 2.3

- Added new chapter on **Food and Product Safety**.

Chapter 4

General

- Added requirement for **minimum emission class Euro 6** for road transport vehicles.

Chapter 4.2.2

- Added requirement to check the **trailer floor** for potential water ingress.

Chapter 4.5

- Added reference to **dedicated guidelines for securing in trailers with walking floor** systems.

Chapter 4.5.1

- Included **loop lashing** as an accepted securing method.

Chapter 4.5.1.2

- Added reference to **Cargo Chock 125**.

Chapter 4.5.7

- Added new chapter on **cargo securing guidelines (road) in the United States**.

Chapter 7

Chapter 7.1

- Clarified that **Stora Enso will not accept any costs related to a rejected container**.

Chapter 7.2.3

- Removed references to **pallruns**.

Chapter 8

Chapter 8.1.1

- Added **SEFU's (Stora Enso Flatbed Unit)**.

Chapter 8.1.1.2

- Added basic instructions for handling **SECU units**, with references to:
  - *SECU Handling and Damage Prevention*
  - *Opening & Closing Instructions for SECU Doors*

Chapter 8.1.3

- Rephrased to clarify that **Stora Enso reserves the right to reject a vessel** if criteria are not met.

Chapter 8.3

- Added **Letter of Indemnity / Rain Letter**.

Chapter 8.3.2.2

- Rephrased to include **discharging and positioning of pulp bales**.

Chapter 9

Chapter 9.3

- Harmonized **damage criteria** across different product types.

General

- Updated **contact information**.

Appendices

Appendix 2

- Renamed *Mikoplast* edge protectors to **BEFORM**.
- Added **Plastex "KP-Paper"** edge protector.

Appendix 8

- Updated to refer to **Directive 2022/2561** (latest version).

General Document-Wide Updates

- Full layout updated to comply with the current **Stora Enso house style**.

Introduction

§1 The Cargo Handling and Securing Manual (the "Manual") sets out the contractual minimum standard for the supplier involved with Stora Enso cargo. It provides guidelines and instructions to help the supplier meet Stora Enso's basic quality and safety standards for the handling, storage and transportation of cargo, as well as the methods and equipment to be used. The purpose of the Manual is to ensure efficient logistics services, that cargo is handled and secured in a way that avoid damage and that those involved in the supply chain process are free from any harm.

§2 The supplier must comply with the Stora Enso Supplier Code of Conduct. Under the Code of Conduct the supplier is required to have a management system in place that takes into account the size, complexity and risk environment of the suppliers' business, including a systematic approach to the assessment, mitigation and management of risks related to human and labour rights, occupational health and safety, responsible business and environmental impacts. Applicable laws, regulations and contractual terms governing the supplier's services shall be complied with. Sufficient training must be provided regularly to relevant employees and business partners.

§3 The supplier is always ultimately responsible for the performance of the agreed services, i.e. to ensure that the services are performed in a safe, professional and competent manner using best practices. The supplier must also ensure that storage, handling, securing and transport services are conducted in accordance with any and all Stora Enso guidelines and instructions, laws or regulations, national or international. As Stora Enso cargo is often transported between countries, the supplier must also follow local rules in all of the countries where the supplier will perform its services and/or, when it comes to the securing of cargo, in all of the countries through which Stora Enso cargo is transported. The supplier must ensure that this Manual is also adhered to by any sub-supplier or sub-contractor, appointed by the supplier. The supplier is liable for any sub-supplier or sub-contractor as for themselves.

§4 The Stora Enso guidelines and instructions, set out in this Manual are not exhaustive nor are they binding as to the exact performance of the agreed service(s). However, the guidelines and instructions are a mandatory minimum standard. As long as the quality and safety standards of the supplier are equal to or surpassing those set out in the Manual, provided that there are no other negative consequences for Stora Enso or Stora Enso's cargo, the supplier is free to use alternative methods. In such circumstances, the supplier must always inform Stora Enso about these best practices, so that they can be incorporated into future updates of this Manual.

§5 A supply chain may consist of various activities, carried out by different suppliers. These activities are outlined in the different sections of this Manual. The sections will apply and be relevant to different suppliers, depending on what part(s) of the chain that they are to perform. The Manual only applies to a supplier as relevant and applicable to the services being provided by that supplier. For example, the sections of the Manual relating to Warehousing and Sea Transportation will not be relevant or applicable to a supplier providing transportation services only by road.

§6 Instructions provided in this Manual currently relate to paper and board in reels or pallets, pulp in bales or reels and different types of wood and bio-based products. Additional cargo categories, e.g. paper for recycling, pellets, round wood, liquid cargo and parcels may be added in forthcoming updates.

§7 Please note that this Manual refers to laws, regulations, principles and standards by public and industry organizations that may be amended. To avoid any doubts, such amendments, updates or new regulations are effective from the date when they are taken into force and will, from that time, be valid even if this Manual has not yet been updated accordingly.

§8 This Manual is an integral part of the Stora Enso frame agreements for logistics service providers and, hence, any transport agreement or other logistics service agreement concluded based on such agreement.

Table of Contents

1. SAFETY FIRST

The purpose of this Manual is to ensure that Stora Enso's cargo is efficiently handled and secured to avoid damage. But more importantly, our guidelines and instructions also aim to safeguard the health and wellbeing of all those involved in the handling, securing and transporting of our cargo, as well as all those subjected to risk if safety is not prioritised – our own staff, those providing services on our behalf and third parties.

The supplier is responsible for ensuring that its staff, as well as any sub-supplier or sub-contractor, are provided with and use all necessary and appropriate safety equipment. The supplier is also responsible for ensuring that appropriate safety training is provided on a regular basis and that risks related to occupational health and safety are assessed, mitigated and managed in a systematic way for continuous improvement. Supplier must report any and all safety incidents and accidents without a delay when it concerns Stora Enso operations.

In addition to the requirements and recommendations in this Manual, there may be additional specific safety regulations in place at contracted warehouses and terminals, at Stora Enso's premises or upon arrival at our customers. All suppliers of Stora Enso are required to get acquainted with and follow such safety rules and instructions. At times, local safety instructions will have to be confirmed in writing by the supplier.

Safety starts with the individual

No fire

No smoking (except in designated areas)

Never drive or work under the influence of drugs or alcohol

Never exceed speed limits or use mobile phone while driving

At all locations

The minimum Personal Protection Equipment (PPE) to be used at all times includes high visibility clothing and safety shoes.

Safety vests and other high-visibility clothing

Safety shoes

Safety helmet

The use of a safety helmet is strongly recommended.

At times, ear and eye protection and/or other safety equipment is also required.

Always wear a seat belt when in a vehicle.

Eye protection

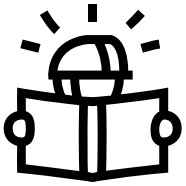
Ear protection

Seat-belt

At all operational areas, including loading and unloading location

Upon arrival at the loading and/or unloading location, always report to the gate, become acquainted with and follow the local instructions, and only park in designated parking areas.

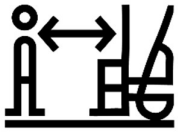
Report to gate



Follow local instructions

Park only in designated areas

Loading and unloading activities can be particularly dangerous. Always stay clear of operating equipment, do not leave safety zones without permission and seek eye contact to avoid subjecting yourself and others to risk.



Stay clear from cargo being handled

Stay safe and out of the way

Seek eye contact

In Ports

When visiting ports it is important to provide the supplier/port authority with advance notice so that necessary arrangements can be made to be in line with the ISPS Code and/or other local safety policies and requirements.

“The International Ship and Port Facility Security Code discibes responsibilities to governments, shipping companies, shipboard personnel, and port/facility personnel to "detect security threats and take preventative measures against security incidents affecting ships or port facilities used in international trade."

2. WAREHOUSE & STORAGE

Proper storage or warehousing of Stora Enso cargo requires a well-designed facility, documented processes, continuously and appropriately trained staff and a well-maintained, clean and properly run warehouse.

The supplier must have adequate warehouse bookkeeping records, including, but not limited to, a record of the stock balance. These records must show, as a minimum: what has been received and when; what has been delivered, when and where or to whose custody; and what the warehouse contains and where it is located.

The supplier must compare physical stock balance and stock records once every quarter and report any discrepancies to Stora Enso. Stora Enso will conduct a Physical Stock Taking ("PST") together with the supplier at least once per year, at no extra charge to Stora Enso.

2.1 Archiving

All shipping documents must be archived and stored for at least 10 years, either in their original versions or electronically scanned and saved. Documents must be archived and saved/stored in an appropriate way that the following information can be retrieved:

- Transportation date.
- Order number(s).
- Unit number(s).

All archiving and saving/storage is to be made in a safe and secure way considering the risk of, e.g. fire, theft and water damage. The supplier is to inform Stora Enso of how document archiving is managed and consider any proposals put forward by Stora Enso for improvement. Furthermore, Stora Enso must be informed of any damage to document archives.

2.2 Warehouse

A warehouse needs to fulfil certain requirements in order to ensure good, safe and adequate storage of Stora Enso cargo. The supplier must ensure that the building is well constructed and consists of appropriate materials that ensure the cargo is completely protected, even in extreme weather conditions like wind driven rain or snow.

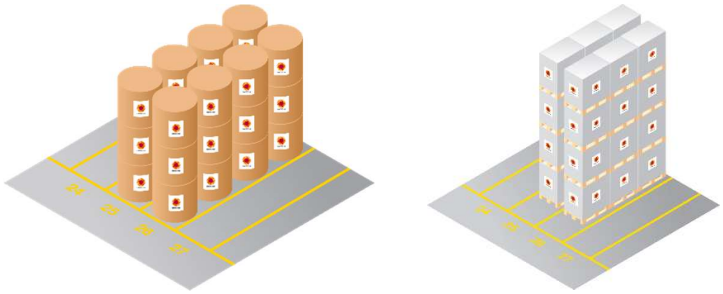
2.2.1. **Floor**

The floor must be firm, even, dry and clean. Preferred floor surfaces are polished concrete or bitumen. Concrete floors are also to be sealed off to prevent dusting, e.g. with an epoxy and urethane coating that is chemical, stain and skid resistant and easy to clean. Regular cleaning of the premises is required and grease/oil leaks must be removed immediately by using absorbing material. The floor is to be designed to withstand the weight of the stored cargo (minimum 9T/m²) and machinery operating inside the warehouse. Cracks, uneven areas and damage to the floor must be repaired as soon as possible and in a durable way. Until repaired, these areas are to be clearly marked and must not be used for storing cargo.

2.2.2. **Layout**

The layout of the floor must be done in such a way that there is an optimal use of the available space, also taking into account different obstacles, structural elements, fire-fighting equipment and emergency exits. Sufficient space for safe manoeuvring with handling equipment is essential.

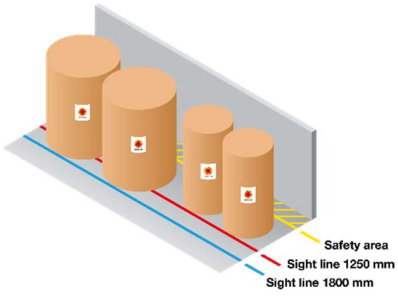
In particular:
Storage areas must be clearly marked by using lines and location numbers.



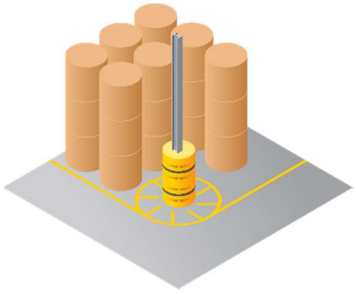
Storage by bay marking

Approximately 30-50 cm of free space must be kept from walls, pillars, pipes and other obstacles and must be marked as 'safety area'.

Best practice – sight line(s):
As it is often difficult for the forklift driver to see the 'safety area' properly, a best practice is to add additional sight lines (based on the most common diameters/dimensions). The first unit is to be positioned immediately after this line. Multiple sight lines can be used for different diameters.



Safety area with sight lines

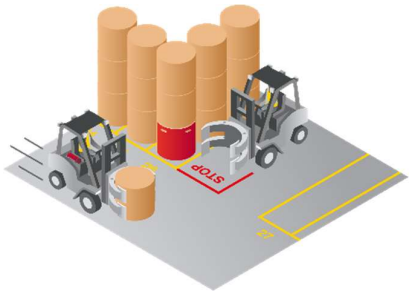


Safety area around pillar

To ensure safe working conditions and efficient operation, it is highly recommended to implement and follow 6S principles.

All routes for pedestrians, traffic guidance and areas restricted to visitors, e.g. at loading areas, must also be clearly marked.

Inside the warehouse, a separate specially marked quarantine area must be in place for cargo that is damaged or classified as 2nd grade.



In-house traffic guidance

2.2.3. **Roof**

The roof (ridge roof recommended) must be in good condition, 100% watertight, properly collecting and draining rainwater and regularly checked and cleaned. The warehouse is also to be equipped with effective drains that can withstand large amounts of water in case of heavy rainfall. Rainwater drainage pipes and gutters should preferably be located on the outside, with a backflow prevention system. These must be checked regularly for damage and/or loose parts. Indoor drainage pipes need to be protected.

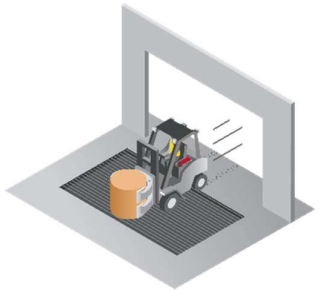
2.2.4. **Walls and pillars**

Walls must be in sound condition to avoid water, snow, dirt and animals from entering into the warehouse. If construction requires pillars, these must be well marked and protected to avoid damage with a 30-50 cm safety area to be marked around them.

Pillar protection with safety

2.2.5. **Loading docks and doorways**

Loading docks and doorways must be adjustable for different loading operations and designed to take the weight of the handled cargo and machinery. In addition, they must be equipped with automatic or manual restraining systems, e.g. wheel-locks securing vehicles and preventing moving and tipping. Docks must provide shelter from adverse weather conditions and be broad enough to guarantee safe truck docking. Doorways must be equipped with cleaning systems, e.g. gratings that remove dirt from wheels to prevent contamination of the storage area.



Door grating

2.2.6. **Lighting**

Adequate lighting is required. Buildings can be designed to maximize daylight usage, but direct sunlight onto the cargo must be avoided as it can lead to discoloration and downgrading of the product or even rejection.

LED lighting is preferred as this is more durable, consumes less electricity and emits/radiates less heat. All lamps must have protective covers to prevent glass splinters falling onto workers and stored cargo. The minimum safety margin from the highest point of the cargo stored to any lamps is 1 meter.

2.2.7. **Fire safety**

Fire protection systems must be in place and fulfil national requirements. Escape routes, firefighting equipment and walkways must be free from any obstacles and signs are to be clear and visible. Scrap paper, rubbish, idle pallets, etc. must be removed immediately from the warehouse, be disposed of or stored separately. Smoking is strictly prohibited and only allowed in designated areas. Personnel must be trained to use firefighting equipment.

Regularly inspected fire extinguishers must be clearly marked, checked and easily accessible throughout the warehouse.

Sprinkler systems are highly recommended. Every warehouse must be equipped with early fire- and smoke detection devices. Automatic alarm systems, preferably linked to fire departments, are required. In case there are water tanks supplying sprinkler systems inside the warehouse, they need to be protected and no cargo can be stored within 5-6 meters.

Forklift trucks must each have a special dedicated parking space at least 4 meters away from combustible materials. For overnight parking, this minimum distance must be 8 meters. Parking should preferably be arranged outside the warehouse or in a separate, designated area.

Fuelling and recharging of trucks should be done outside the warehouse due to both fire and contamination risks. However, if these procedures are carried out inside a warehouse, all appropriate safety measures must be taken. E.g., the surroundings of the fuelling/charging stations shall be free from all combustible materials and clear from stored cargo. The fuel tank shall be placed inside a safety basin or have a double hull. The equipment in the stations must be protected from hits and breakage due to machinery. When fuelling the forklifts, the nozzle should not have a hold-open latch. In addition, sufficient firefighting equipment must be available near the fuelling station.

Charging stations for electric machinery must be installed according to manufacturers guidelines and general fire safety regulations.

Handling equipment such as forklift trucks must be equipped with either a portable extinguisher or an automatic fire extinguishing system.

2.2.8. **Other safety measures**
To ensure a safe working environment and safeguard against trespassing, theft or other risks, other additional measures may also be appropriate in a warehouse setting, e.g. surveillance cameras, mirror balls, anti-collision systems, etc. It is the supplier's responsibility to identify and install any additional measures that are necessary or appropriate in their specific warehouse setting.

A good safety practice is to conduct regular safety drills or toolbox talks with warehouse staff to reinforce safety protocols, address potential hazards, and ensure everyone is prepared to respond effectively in case of an emergency.

2.3 Food and product safety

Many Stora Enso products have end-uses in food, hygiene, pharma and other sensitive applications. Suppliers must ensure the purity and product safety of the material in all their operations and facilities.

Stora Enso products that are intended for food contact applications shall comply with the relevant regulations of food contact material legislation or with certain other requirements. Examples:

- Regulation (EC) No 1935/2004 on materials and articles intended to come into contact with food
- Regulation (EC) No 2023/2006 on good manufacturing practice for materials and articles intended to come into contact with food
- ISO 22000 and/or FSSC 22000 or BRCGS certified product/foodsafety management systems
- FDA legislation/regulation in USA

2.3.1. **Risk assessment and mitigating actions**
The supplier must have a documented self-monitoring process to assess and mitigate potential food and product safety related risks. Stora Enso expects suppliers to understand and follow good hygiene practices (GHP). To minimize biological, chemical and physical risks that could cause cargo to be unsafe for its intended end-use.

For additional guidance please see: https://www.fao.org/good-hygiene-practices-haccp-toolbox/ghp/transportation/en

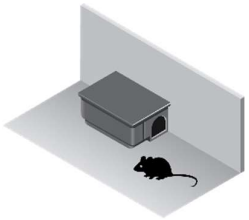
2.3.2. **Hygiene rules**
The supplier must have clear hygiene rules for personnel and visitors: Eating, drinking and smoking should only be allowed in designated areas. Work clothes must be clean and in good condition. Hands must be washed before entering the storage area and especially when touching the goods (e.g. refurbishments).

2.3.3. **Pest control**

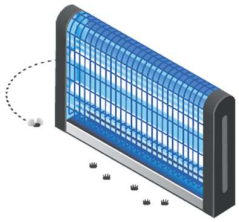
To ensure food/product safety during storage necessary precautions must be taken to avoid insects, birds and rodents from entering and/or nesting inside the warehouse. Firstly, ensuring that the entire building is frequently inspected for any openings or gaps (condition of doors, walls, etc.). Secondly, through a variety of methods including but not limited to closing doors and gates, installing bait boxes and traps, electrical discharge insects control system or any other repellants.
Best practice is the use of automatic closing doors and gates to ensure that they are closed when not in use.

When materials intended for food applications and for the food value chain are stored, traps and/or bait boxes or similar also depending on local legislation must be foreseen. Quantity and positioning of traps, bait boxes or similar needs to be tailored to the size, location and specific key risks of the warehouse. Best practice is that pest control is managed by a specialized company. The bait boxes and/or traps must be checked frequently, results analyzed and documented to identify trends in pest activity.

Pest control



Bait box



Electrical discharge insect control system

Reel affected by bird droppings

2.3.4. **Chemical and waste handling**

Chemical products (incl. lubricants, cleaning agents and detergents, etc.) must be labelled accordingly to applicable legislation and registered in an inventory. These products must be stored separately and in a lockable closet in accordance with manufacturers' instructions.

Trash containers shall be clearly identified for their intended purpose, located in designated areas. They should be closed with a lid and locked if hazardous.

2.3.5. **Damaged goods and refurbishments**
The supplier must have processes for handling the damaged goods in place to confirm that those are not sent to customers and the goods are destroyed when agreed to do so. In case of refurbishment, it should be performed in a dedicated, well-marked area. Best practice is to perform refurbishment of materials intended for the food value chain in a hygiene zone, separated from the warehouse operations.

The refurbishment area should be free from any personal or loose items (a.o. jewelry, medicines, pens, snap-off blades, food) that could be a source of contamination. Work attire should be adapted (e.g. no chest pockets) and requirements should be displayed at the refurbish area and visitors informed accordingly.

The glue, tape and wrapper material used in the refurbishing process must be in accordance with the food safety requirements. The supplier must be able to provide the technical datasheets for the used products/materials and ensure that the storage of these products adhere to the same food safety requirements.

2.3.6. **Training and incident reporting**
Part of the documented process is regular training of staff to make sure competences are in accordance with guidelines concerning product safety.

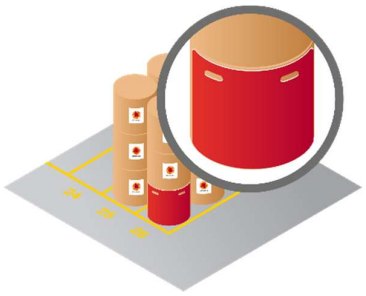
Incidents and complaints concerning product safety and hygiene must be reported to Stora Enso and affected units separated from prime stock.

2.4 Storage

The supplier must ensure that Stora Enso cargo is not stored together with other cargo that could endanger the quality of our products.

Reels and pallets must be kept in different, well separated areas or with sufficient space between both. Orders in the warehouse are to be stored in such a way that the rule "first in - first out" is respected and unnecessary handling is avoided.

Units surpassing the line-paintings, close to driveways and positioned on the corners must be protected by reel/pallet guards.

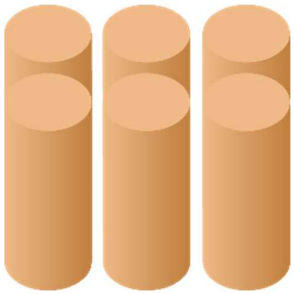


Reel guard correctly placed in corner

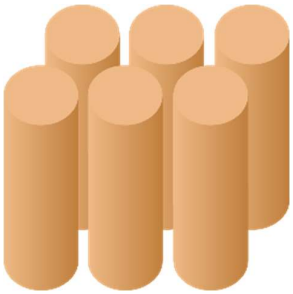
2.3.7. **Reels**

Reels must be stacked vertically using a single column stacking pattern with adequate space of minimum 5 cm between reel stacks to allow forklift truck access and to avoid overlapping of reels.

Both soldier stacking and zig-zag stacking is accepted. The use of one or the other is depending on the bay size and reel diameter.



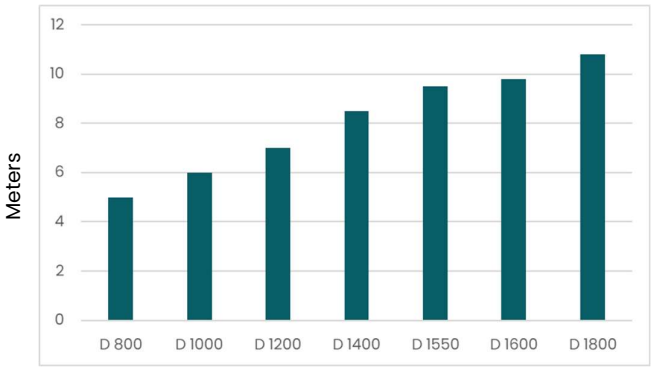
Soldier stacking



Zig-zag stacking

Safe stacking heights

The strength of the warehouse floor, the roof construction and possible restrictions from sprinkler systems and lighting must be taken into account when considering safe stacking heights. The table below sets out the maximum safe stacking height of reels based on reel diameter.

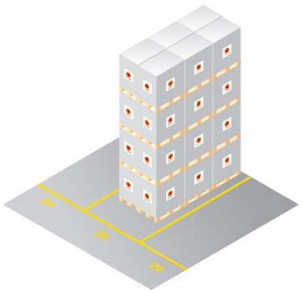


Safe stacking height of reels based on reel diameter

2.3.8. **Pallets**

Stacks must be stable and balanced, as an irregular, imbalanced stack might tip over and damage the cargo and its surroundings.

Safe stacking is limited to a maximum of 4 pallets high. Depending on pallet type and size, pyramid stacking can be used to add stability.



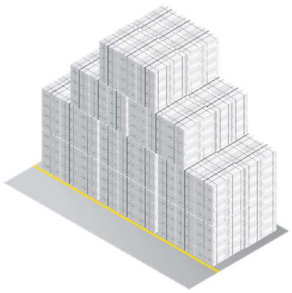
Maximum 4 pallets in height

No overlapping of stacks

2.3.9. **Pulp**

Stacks must be aligned and in good shape/condition, with sufficient gap between units in order to unload without damaging the product or its wires. The bottom 2-3 layers can be stacked vertically, any additional layer need to be pyramid stacked whilst keeping the front aligned.

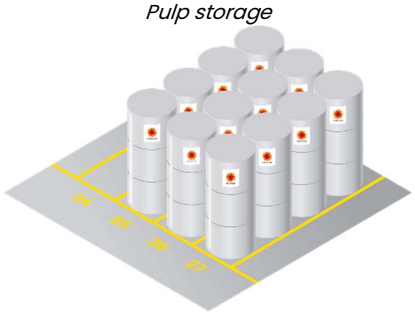
Storing is limited to a maximum of 5 units in height or 9 meters.



Pulp storage

The storage of fluff-pulp is to be undertaken in the same way as paper/board reels. The packages shall be stored in a normal warehousing conditions and with a humidity of maximum 60%. The PE wrapping shall remain and must remain intact to avoid dirt, contamination and dried up outer layers. If above conditions are met, the guaranteed storage time is up to 2 years.

Storing is limited to a maximum of 3-4 units in height or 6 meters.



Fluff storage storage

When handling FSC® or PEFC certified pulp (Forest Stewardship Council / Program for the Endorsement of Certification Schemes), there are specific requirements that must be taken into consideration.

FSC®/PEFC certified pulp is to be kept physically separated from other material, based on Stora Enso order number at all times during discharging, storing and loading operations. Most of the pulp is shipped under Stock Transfer Order (STO) without claim (pulp owned by Stora Enso) and FSC®/PEFC certification is defined based on customer order. All physical markings to pulp units, related to certification, is forbidden. Supplier must report pulp stock levels frequently based on Stora Enso order number and product status. Records of inputs, outputs and deliveries need to be documented. FSC®/PEFC pulp must be tracked and controlled, and records of shipping documentation must be archived for all FSC®/PEFC certified pulp.

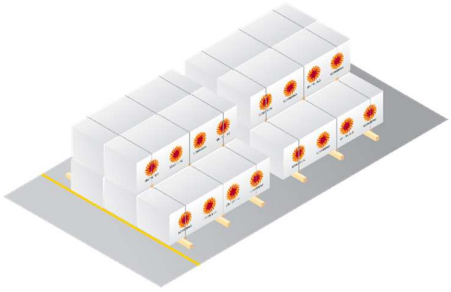
FSC®/PEFC accredited certification body is allowed to audit supplier premises, if confirmed by Stora Enso. The supplier must appoint a person who is responsible for FSC®/PEFC. All personnel handling FSC®/PEFC pulp must receive special training which has to be documented.

The supplier must inform Stora Enso if they outsource anything related to FSC®/PEFC certification requirements.

2.3.10.**Sawn timber**

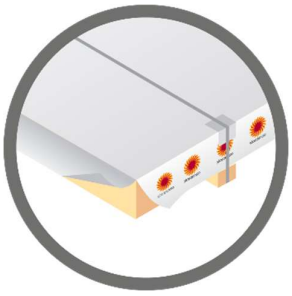
Sawn timber must be stored indoors or covered so as not to be affected by moisture. The storage location must be equipped with a suitable number of wooden dunnage in sound condition to be placed under the packages. Stacking is to be done so that working in the warehouse is safe. Timber packages must not lean against structural elements of the warehouse.

Packages that appear damaged, leaning, deformed, have broken bands or are poorly protected must immediately be fixed. The contents of the original package may not be changed.



Timber storage

2.3.11. **LVL (Laminated Veneer Lumber) / CLT (Cross Laminated Timber)**
LVL and CLT packages have to be stored under weather-protected cover. The packages must be placed on wooden dunnage off the ground on a flat and dry surface. The skids must be of a suitable size and number. They must also be evenly spread to prevent the cargo from becoming twisted or crooked. If storing packages for more than a week and in case that product is fully wrapped, the bottom corner of the plastic wrapping is to be cut open to allow for air circulation.

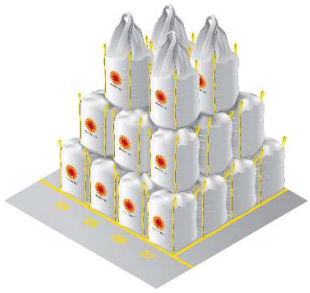


Air circulation for LVL package

When products are stored on the construction site for a longer period of time, extra weather protection measures need to be taken (E.g. tarpaulin).

2.3.12. **Big bags**
Certain products are packed into big bags, such as lignin, pellets and bio composites. Big bags must always be stored inside a warehouse or under canopy. Any adverse weather conditions such as rain and snow as well as direct sunlight need to be avoided. Exposure to such conditions can significantly weaken the strength of a big bag.

In case the big bags need to be stacked, a pyramid pattern must be used if there are no retaining walls of sufficient strength to provide support.



Big bag storage

3 HANDLING

3.1 Handling equipment

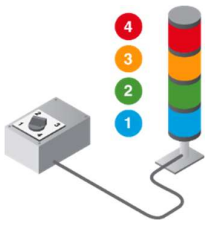
3.1.1. **Forklift trucks**

The equipment used must be intended for the specific cargo being handled and be in good condition to ensure efficient operations. Forklift trucks must be regularly checked regarding emissions, consumption and any issues resolved. Forklift trucks with clamps must be equipped with a mast tilt indicator (with sensor in the mast) and signal lights indicating the used clamping force.

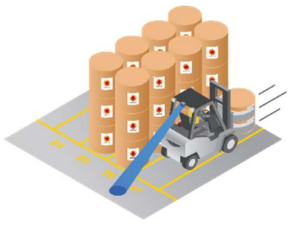
The type of work, working conditions and cargo must be taken into consideration when choosing the equipment. All machines and equipment must undergo regular, well-documented maintenance and check-ups. In order to relieve point load when entering a transport unit with a heavy load, it is essential to consider the width and pressure of the tires.

For safety reasons and to increase visibility, all handling equipment must have the lights on at all times during operation (both operating + blue spot™). Camera systems are highly recommended.

Mast-tilt indicator



Clamp force indicator



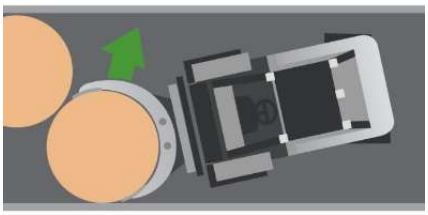
Blue Spot™

3.1.2. **Clamps**

Selecting the correct clamp type and ensuring that equipment is in good condition is essential for operating efficiency and to avoid damage to equipment and cargo. There are several clamp type options depending on the usage, for example:

- Pivot arm clamps.
- Non-rotating single or multiple paper reel clamps.
- Rotating clamps.
- Swing frame clamps.
- Sliding arm clamps.
- Fixed or split arms.

Rotating clamps normally have short and long arms and are required when handling cargo in tight spaces such as containers and rail wagons. With this design, tighter stacking with less clamp truck manoeuvring is possible when the short arm is turned towards the wall and with the long arm making the clamping movement.



Manoeuvring in tight places and correct usage of clamp

Clamp pad surfaces for reel handling must be rubber coated. Steel sprayed/waffle pads are only accepted when handling cargo in temperatures below 0˚C. Clamps and clamp pads must be checked every time before starting the operation. Clamps must be free from oil and other contaminants that can stain the cargo. They must also be undamaged and without any sharp edges. Springs must be in good condition and standing supports are required. The type and size of attachment is also to be adequate for the type of cargo to be handled and operations performed.

Bale clamps must have steel patterns, providing extra grip to the bales. Ideally, they are also equipped with metal bars ('bull bar') to prevent the bales from getting into contact with the clamps' hydraulics. When handling 5 or more units, a middle clamp pad is required.

Attachments must undergo daily inspection and frequent maintenance to avoid defects that can cause damage to the handled cargo. Equipment and attachments may only be used for the purpose they have been designed for.

Reel clamp and clamp pad

Middle clamp pad and bull bar

3.1.3. **Forks (regular, multiple handling, toaster, top securing arm)**

Forks must be adjustable to the size of pallets. This is to ensure that the unit standing behind the pallet is not affected when handling the one in front.

A shortening device or penetration meter can be used, and different pallet sizes can also be painted/marked on the forks. Hydraulic side shift and top securing arms are recommended for safe pallet handling.

Forklift with double pallet handlers

Forklift with top-securing toaster

Forklift with top-securing arm(-s)

Before operations, the handling equipment must be inspected by the supplier for any damage and/or defects. Before handling, the condition and the quantity of the cargo are to be checked.

Discharging of a transport unit must be carried out taking into consideration how the transport unit was loaded. Preferably, the same method must be used, but in reverse, to ensure a safe procedure. Handling is an important part of the supply chain and must be carried out in such a way that it does not have a negative effect on the condition of the cargo.
The handling of cargo can involve risks for those involved in the operation. Always stay well clear of operating equipment, do not leave safety zones without permission and seek eye contact with the forklift operator if your support is required.

Do not stand under the load

Do not stand on top of the load

Do not stand in near the load

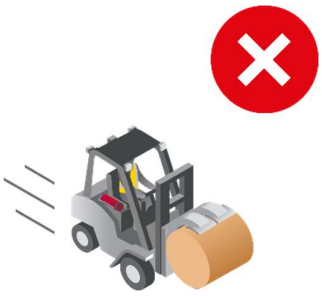
Do not stand between the clamping arms.

No loose (unclamped) reels/ No free riders

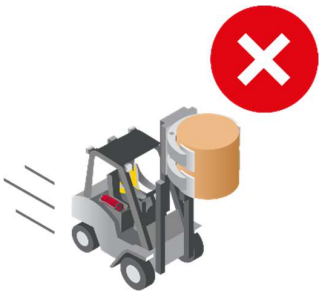
3.2 Reels

Paper and board reels are prone to damage and have a high unit value. Best practice operation and well maintained equipment is therefore essential. Reels must be kept in an upright position and not be pushed over any surface. Clamps used to handle reels must have a sufficient number of correctly positioned arms and apply the correct clamping force.

3.2.1. **Reel handling**

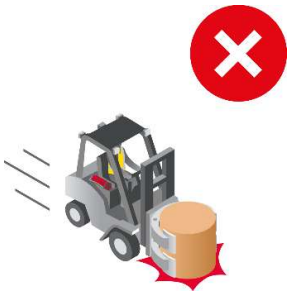


Do not transfer reels horizontally

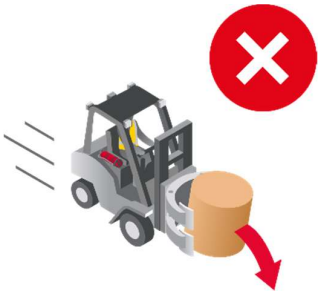


Do not drive with load lifted too high

No overloading

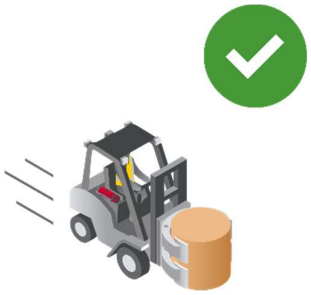


Do not push or drag reels on the floor



Do not open clamp while driving.

Do not handle multiple reels with single arm clamp



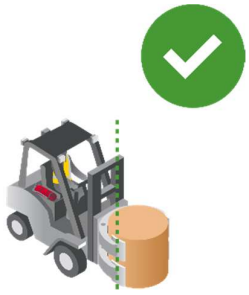
Correct transfer/handling of reel

3.2.2. **Mast-tilting**

A mast tilt indicator is required on all forklifts equipped with clamp to ensure correct positioning of the mast. When the mast is not tilted correctly, it can result in:

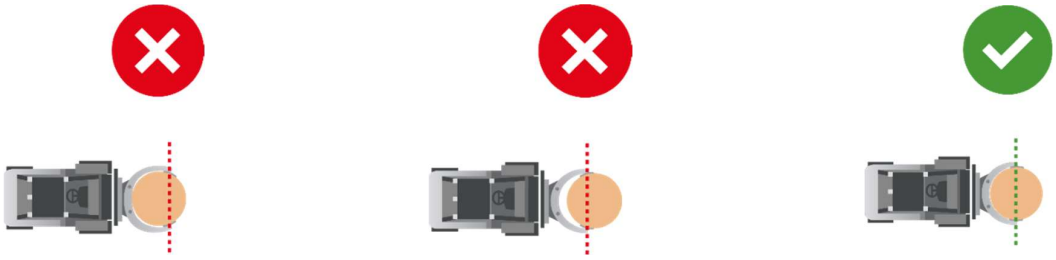
- Bad grip between contact pad and reel.
- Mechanical damage on contact pads.
- Belly damage on reel.

Incorrect mast-tilting



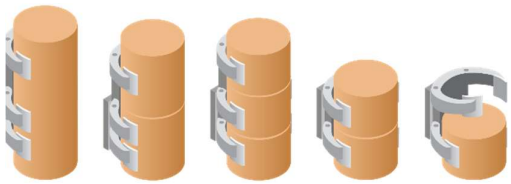
Correct mast-tilting

3.2.3. **Clamp positioning**



Do not clamp too deep *No tip clamping* *Correct clamping*

3.2.4. **Correct use of split arms**

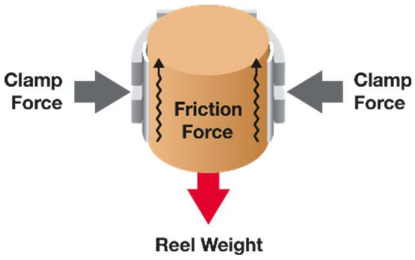


Never clamp reel joints due to risk of edge damage and dropping reels

3.2.5. **Clamping force**

Clamping force is the force that the clamp applies to the reel. The force to be used is based on the product grade, the weight, dimensions, friction, wrapping, and environment.

Manufacturers of equipment provide tables for the conversion of hydraulic pressure to clamping force (in kN). Clamping force depends also on the opening of the clamps (diameter of reel) which, in turn, depends on the type of clamp. If the clamping force is too high, it will lead to out of round (OOR) reels that will be rejected by the customer.

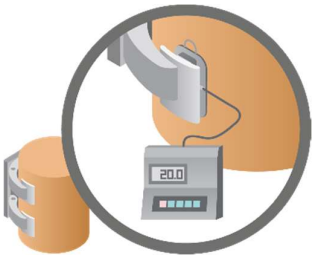


Forces during clamping

The clamping force must be checked at least every 100 working hours, at every maintenance interval and after changing attachments. Records must show pre-adjustment measurement and be filed and made available for inspection.

A selection valve, by which the clamping force can be adjusted in steps, is required. Different-coloured lamps placed on top of the forklift truck must indicate the clamping force used (exception: intelligent clamps).

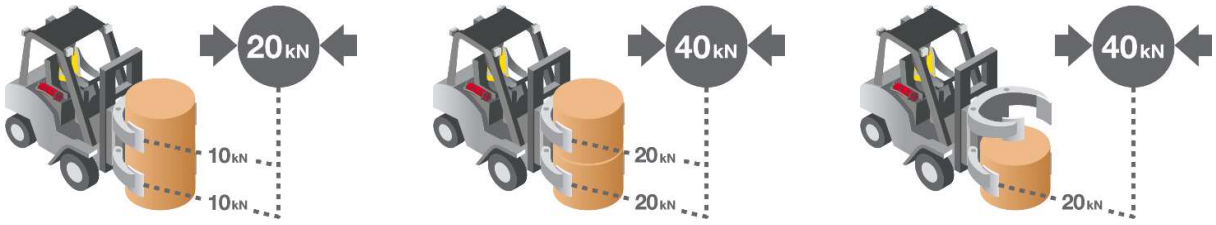
The maximum permitted clamping force is stated on the labels of the reels or is mentioned on the side of the reel. If not, then the table provided below indicates the maximum force according to the weight and grade of the reel.



CF test/measurement

Clamp force reduction valve	Recommended value	Total clamping force 2 arms	Weight per reel (kg)
1	10 kN	20 kN	< 500
2	15 kN	30 kN	500-1500
3	20 kN	40 kN	1000-2000
4	27,5 kN	55 kN	2000-4000

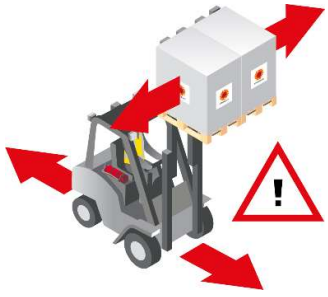
Clamps equipped with one cylinder per arm will automatically split the clamping force (see picture below). In case of common cylinders, splitting of the clamping force must be done by an adjustment valve.



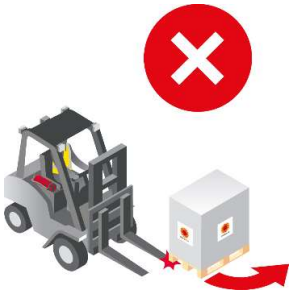
Correct handling of reels when 20kN is stated on the label

3.3 Pallets

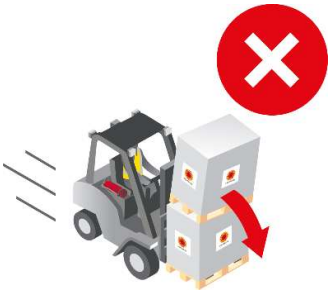
Pallets must be kept in an upright position and not be pushed over any surface. Feet and banding are to be kept in good condition.



Limit movement with load lifted

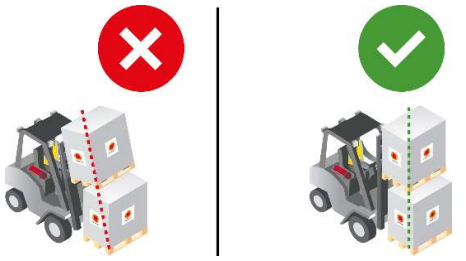


Do not push or move pallet with forks

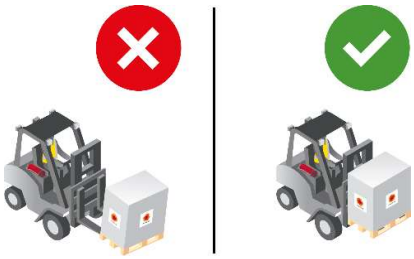


No unsecured pallets (no free riders)

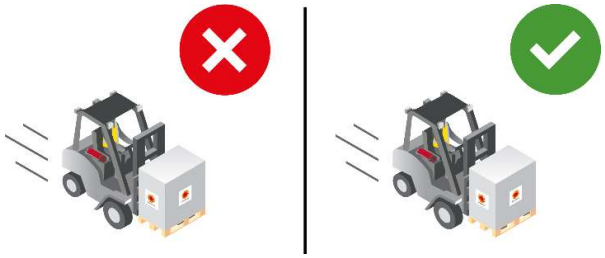
Mast tilt must be kept vertically straight so as not to create damage to the pallet base, side or other pallets when stacking and handling. Forks must be suitable for each pallet size. Double fork attachments are required when handling multiple pallets. The spread and length of forks must be adjusted in order to guarantee stability and safety when handling.



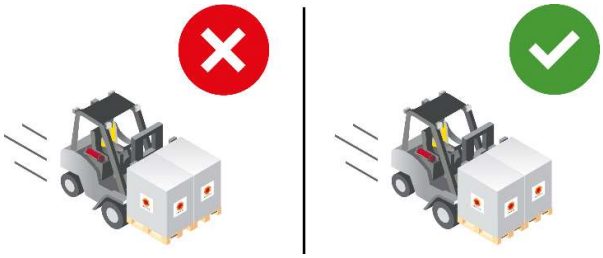
Mast till to be kept vertically straight



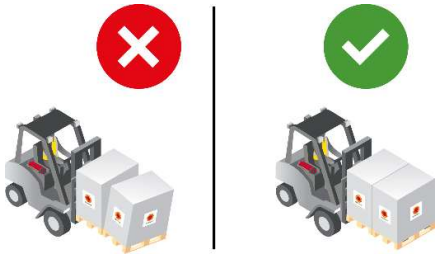
No pallet handling on fork tip only



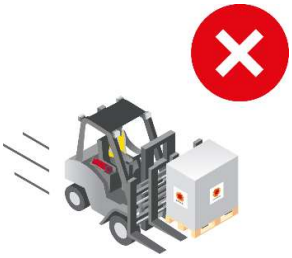
Spread forks correctly



Do not handle two pallets with only two forks



Use long enough forks for adjacent pallets

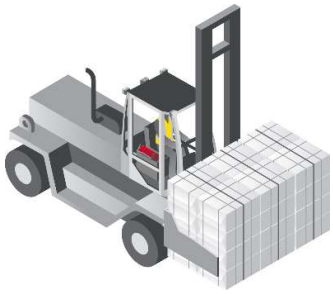


Single pallets not to be handled with double forks

Attention for protruding fork tips

3.4 Pulp

Pulp bales are clamped at the bottom part of the product. Units must be aligned from all sides. Clamps may not be placed between the product and bale wires as this may cause the wires to break when opening the clamp. When lifting of units is required (by crane), clamping on the lifting wires side is not allowed. This can weaken the strength of the wires and may cause them to break, resulting in dropping of units.



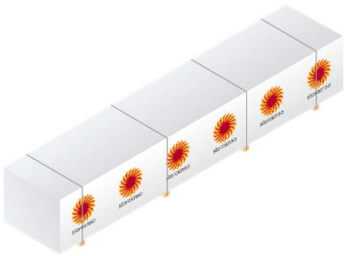
Correct clamping of pulp bales

Pulp is normally handled 1 to 4 units at a time. When handling 5 or more units, a middle clamp pad is required. Only clamps appropriate for the handling of bales may be used and the clamping pressure must be appropriate. During handling, bales must be lifted high enough above the floor to avoid scraping.

Fluff-pulp is to be handled in the same way as paper/board reels keeping in mind the high hygienic requirements. Therefore any damage to the packing, regardless of any contamination, is to be avoided. The unit is always to be clamped in the middle and with a straight mast.

3.5 Timber

Sawn timber packages must be handled in a safe and efficient way. When using forklift trucks, it is important to consider the lifting capacity of the truck and also the size and spread of the forks. Before handling, packages must be checked so that they are stable, not deformed and in suitable condition, i.e. no mechanical damage, broken straps or contamination.

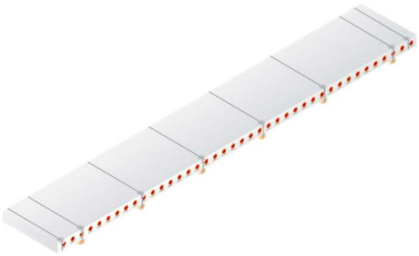


Timber package

3.6 LVL / CLT

LVL & CLT packages, which come in various sizes and shapes, must be handled with forklift or crane and when lifted with a crane only web slings of proper strength and condition are allowed. The use of chains or wires is strictly forbidden as incorrect handling can cause severe damage to the product as well as to its stability. This can lead to rejection of cargo.

When handled with a forklift truck, proper stability has to be considered. The spread of the forks must be wide enough for safe lifting and for extra-long packages two forklifts must be used simultaneously. Repositioning and pushing the packages with the fork tips is forbidden.



Example of an LVL package

3.7 Big bags

Big bags are to be handled by forklift, crane or hoist with a rated capacity sufficient to support the weight of the big bag. Before handling, ensure the big bag is free from any damage that would compromise it´s strength. All recommendations and any instructions printed on the label of the big bag must be adhered to.

- Always use all lift loops, unless the big bag is attached to a pallet;
- Ensure that the forks, crane hooks, bars or other are free of any sharp edges;
- Never tilt the mast of the forklift forward when handling big bags;
- Keep the big bag clear off the floor, so there is no contact to ground or the tires of the forklift. Never drag or push a big bag;
- All personnel must stay well clear from operations when lifting and/or handling a big bag.

Big bag

4 ROAD TRANSPORT

The supplier must ensure that dispatched vehicles are equipped, maintained and fulfilling the following requirements:

- Vehicles must be approved by an Authorized Vehicle Inspection Company.
- All maintenance and repair must be conducted in an environmentally sound manner and well documented.
- Tires must be in good condition, meet high environmental standards and be adapted so as to be appropriate to the vehicle and road conditions, e.g. snow and ice.
- Necessary emergency, lashing and securing equipment must be available in all vehicles.
- Technical support systems must be installed in all new vehicles for the individual monitoring of fuel consumption.
- Vehicles must, at all times, fulfil the legal requirements of the country where the vehicle is registered as well as all of the requirements of all transit countries.

The supplier undertakes to work toward:

- All vehicles are to be of a minimum Euro class 6 or according to identical international standards.
- Drivers being trained in safe, fuel-efficient and defensive driving.
- Increased use of fuels with reduced environmental impact.
- Usage of alcohol interlocks in all vehicles.

4.1 Education and training

Loading and unloading must be carried out by appropriately trained staff. EN 12195-1:2010 and/or VDI 2700, are required for the training, advice and instruction for all persons involved in the securing of cargo on transport units.

Drivers must be aware of the additional risk of the load, or parts of the load shifting when the transport unit is being moved. Stora Enso expects that the supplier conducts the training of drivers in accordance with Directive (EU) 2022/2561 on the initial qualification and periodic training of drivers.

4.2 Inspection of a transport unit

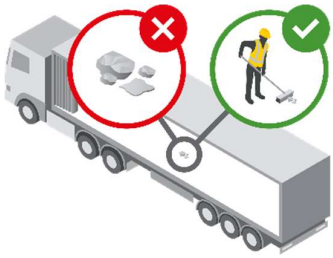
The transport unit must be inspected by the loader before any cargo is transferred. The aim of the inspection is to safeguard that cargo is received undamaged and to comply with AEO requirements for supply chain safety and security, i.e. to confirm that the transport unit is not used for any illegal activity, such as smuggling. The inspection may be performed visually or by using tools. Any suspicious alterations in the structure of the transport unit must be reported to Stora Enso.

If a transport unit does not meet the requirements listed below, it will be rejected until it meets these quality standards. Costs arising in relation to a rejected transport unit are to be paid by the supplier.

4.2.1. **Cleanliness**

The transport unit must be entirely clean before loading Stora Enso cargo. This implies that the trailer floor must be swept and cleared from any debris before the loading operation begins.

It is of the utmost importance that the cargo space is free from any stones, dust, nails, remains of previous cargo, pieces of wood, etc. that could possibly damage the cargo.

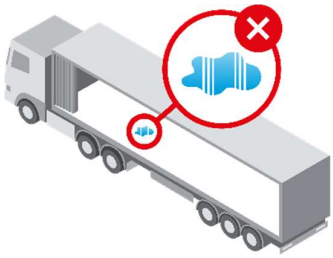


Transport unit to be swept before loading

4.2.2. **Water tightness**

Stora Enso requires that closed transport units are completely watertight. The cargo space must be and remain dry at all times. Hence the importance to check the roof, sides, curtains, doors and floor (panel joints)for any damage that could lead to water entering the transport unit.

Any damage must be repaired in a professional and durable way before loading Stora Enso cargo. Dampness in the cargo space will not be accepted and can lead to the vehicle being rejected.

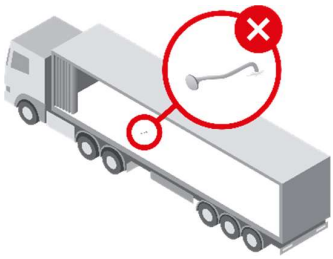


Transport unit to be dry at all time

4.2.3. **Floor**

The floor of the transport unit must always be completely dry, clean and smooth when loading or transporting Stora Enso cargo. Nails, (oil or grease) stains, bolts, dust, remains of previous cargo, wood chips, other protruding objects, etc. are all to be removed and could lead to the vehicle being rejected.

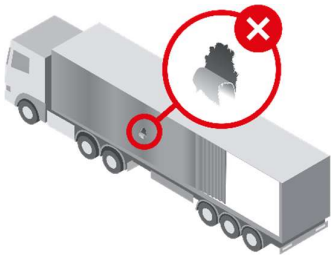
The floor needs to be strong enough (According to DIN EN 283) to withstand/allow the use of loading/unloading equipment such as forklift trucks.



No protruding objects, debris or water on floor

4.2.4. **Sides and roof**

The sides and roof of the transport unit must be in good and sound condition and 100% watertight. Furthermore, the sides are to be even and free from any protruding objects. The top of the roof should be free from any water, snow or ice that accumulated and could come down during loading.



No curtain damage

The trailer's headboard must be smooth and even to avoid damage.

For curtain side trailers, the opening and closing function of the tarpaulin must be in proper working condition and there are to be no damage in the tarpaulin. Any damage must be repaired in a professional and durable way before loading Stora Enso cargo.

4.2.5. **Doors**

The doors, gaskets and locks are all to be in a proper working condition, 100% watertight and assure that the cargo space can be completely closed off.

4.2.6. **Odour**

The transport unit is expected to be completely free of any odour/smell, which may adversely affect Stora Enso cargo. Strong odour from previous cargo, e.g. tea, rubber, perfumes, leather, spices, fish and chemicals may easily adhere to the cargo.

4.2.7. **Truck/trailer checklist**

It is strongly recommended that the *Truck/trailer Checklist* is used by the loading staff in order to verify and document the condition of the transport unit and the cargo securing. Deviations must be noted to avoid disputes upon delivery.

The *Truck/trailer Checklist* is outlined in Appendix 1 and is available on https://www.storaenso.com/en/suppliers/logistics-services/logistics-supplier-information.

Trailer checklist

4.3 Cargo securing equipment

4.3.1. **Lashing points**

All trailers need to be equipped with sufficient lashing points in order to do a proper cargo securing. These lashing points must be in accordance with the applicable European standard, currently DIN EN 12640.

4.3.2. **Edge protectors**

The supplier is obligated to ensure that the correct amount (based on the agreed transport) and type(s) of edge protectors are used as set out in the Manual. In case damaged, wrong types or insufficient number of edge protectors are available on the truck, correct and undamaged ones will need to be sourced locally.

Correct position of edge protectors

Approved types of edge protectors for securing Stora Enso reels are listed in Appendix 2 'List of required Edge Protectors'. No other types of edge protectors than those listed, are accepted for reels. For pallets, no limitative list is available, but the edge protection needs to be sturdy enough (hence no cardboard or weak plastic) to protect the cargo from damage

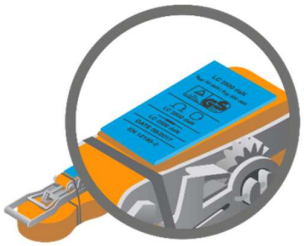
Edge protectors must be placed in the correct location and position (curved side on the reel belly) on the cargo. Note that incorrect edge protectors can damage cargo.

Tools, such as ProPole®, or similar telescopic rods and positioning devices are highly recommended in order to safely and correctly mount the edge protectors (and lashing belts).

Tools used for safe and correct mounting of edge protectors

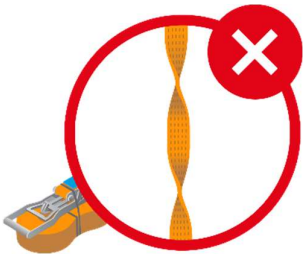
4.3.3. **Lashing belts & ratchets**

Every transport unit must be equipped by the supplier with a sufficient number of belts and ratchets (in accordance with European standard EN 12195-2) for the cargo they will be transporting. Non-fixed belts and ratchets are preferred and obligated when fixed belts are incorrectly located. These must be in good condition, always be inspected prior to loading and replaced in case of any damage or dirt.

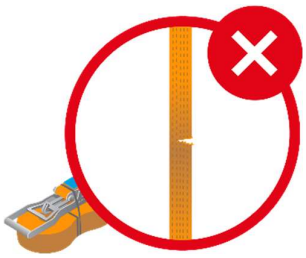


Lashing belt and ratchet

The STF (Standard Tension Force) applied may maximally be 500daN (1 daN ≈ 1 kg) on the side of the ratchet. It is also required that the applicable technical information is available on the belts or its labels. The belts must be placed straight and exactly in the middle of the edge protector.

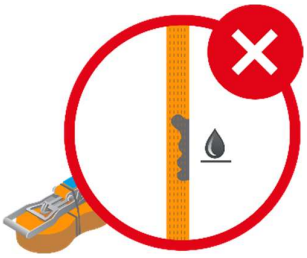


Lashing belts must not be twisted



Lashing belts must not be torn

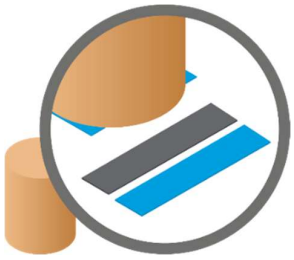
No knots on lashing belts



Lashing belt must be clean

4.3.4. **Anti-slip mats**

The supplier is obligated to ensure that the correct amount of anti-slip material is used as set out in this Manual. In case wrong types, damaged or insufficient number of mats are available on the truck, correct ones will need to be sourced locally.



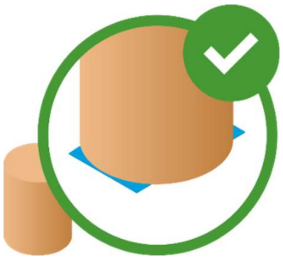
Two types of approved anti-slip mats

Generally there are two types of anti-slip mats frequently used to increase friction and prevent cargo from moving during transport. A heavier 'black' type, made from rubber (such as Regupol®), with a friction coefficient of 0.7µ. The lighter 'blue' version, made of foam (Transpofoam®), has a friction coefficient of 0.8µ. Both are approved for Stora Enso cargo.

Other friction increasing materials are accepted as long as they fulfil a minimum friction of 0.65µ.

Anti-slip mats, at least 150 mm wide and maximum 4 mm thick, must be placed on either side of the cargo lengthwise. For reels, the mats must protrude app. 1 cm. In case of multiple layers, anti-slip mats are to be placed in-between stacked units unless they have friction-end caps.

Anti-slip mats used must be clean, dry and without any defects.

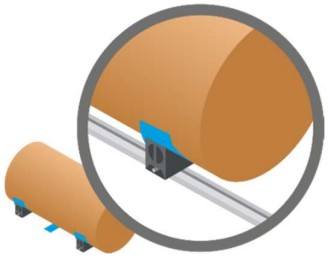


Correct positioning of anti-slip mat

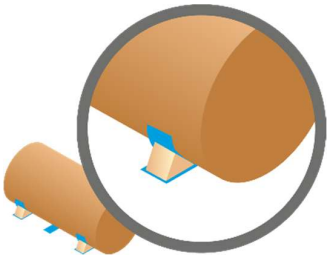
4.3.5. **Wedges/chocks**

Wedges must be used when transporting reels in a lying/horizontal position. These wedges can be constructed from metal, wood or other suitable recyclable materials and are needed to prevent/block the reels from rolling. The height of the wedge must be at least 1/8th of the reel's diameter.

Anti-slip mats have to be placed on top of the wedges and in case of wedges without a connection to the floor (holerail/paperliner) also underneath.



Metal chock and anti-slip mat



Chock and anti-slip mat

4.4 Loading of a transport unit

4.4.1. **Preparation**

The driver needs to ensure that the transport unit passes the inspection and is ready for loading. This includes having the truck stationary and opening the cargo space in such a way that the forklift driver can easily access and load the transport unit. The driver has to sweep the trailer, collect the approved lashing materials (edge protectors and anti-slip mats) and make them well visible.

4.4.2. **Load planning**

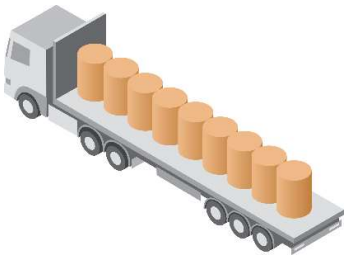
The load planning must always be carried out in accordance with the maximum permissible weight stipulated by each transit country. The same goes for the overall weight distribution and maximum axle load. The maximum payload is legally defined per country and must be adhered to at all times. More detailed and updated information is available on https://www.itf-oecd.org

4.4.3. **Loading patterns**

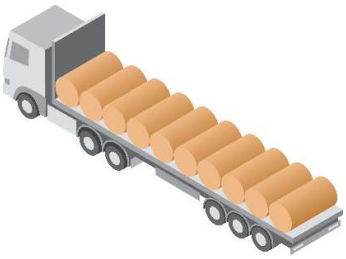
Generally units are to be loaded against the headboard of the trailer. However in some circumstances it might be necessary to leave some space. In those cases, additional lashing is required.

4.4.3.1 Reels

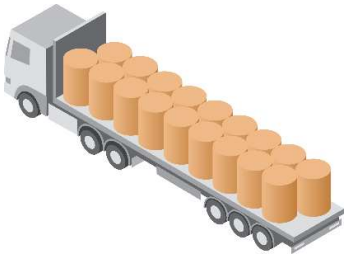
Reels can be loaded in various ways, for example:



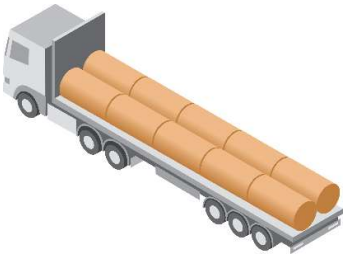
Standing reels - straight



Laying reels - parallel to the axles



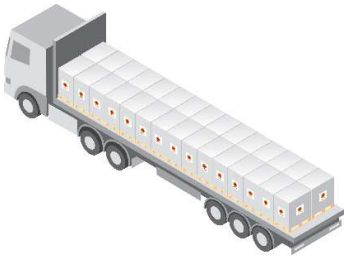
Standing reels -nested/zig-zag



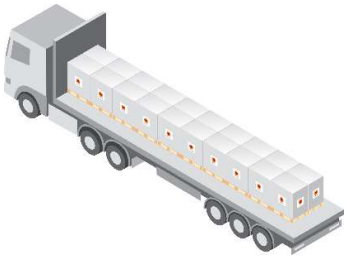
Laying reels - Longitudinal/lengthwise (shotgun)

4.4.3.2 Pallets

Pallets can be loaded in several ways depending on pallet sizes, customer requirements or other reasons:



Long sides of pallets in parallel with the trailer's axles

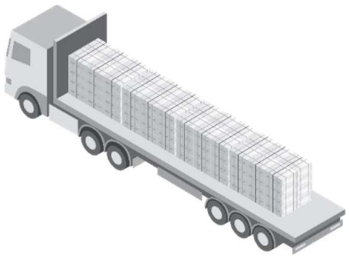


Short sides of pallets in parallel with the trailer's axles

4.4.3.3 Pulp

Pulp must be loaded with long side parallel to axles in the middle of the trailer.

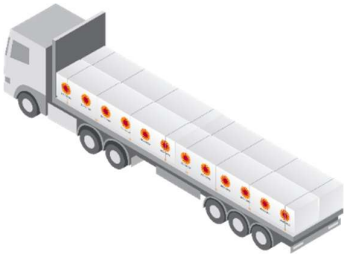
luff units can either be loaded centre line or zig-zag, epending on the diameters and quantity to be loaded. o other cargo may be loaded together with fluff-pulp.



Trailer with pulp bales

4.4.3.4 Timber packages

Timber packages are always loaded lengthwise in the middle of the trailer.

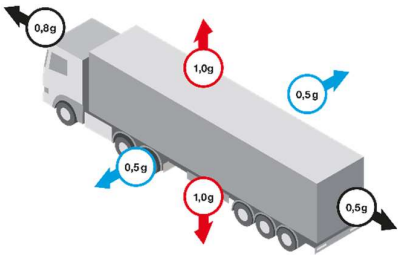


Trailer with timber packages

4.5 Cargo Securing

The European standard EN 12195-1:2010 is applicable for all European road transports carrying Stora Enso cargo. Inland transport in Germany and Austria must also be in accordance with VDI 2700.

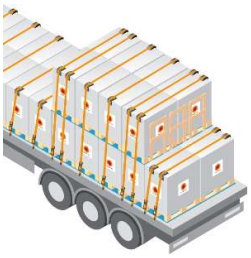
The cargo must be prevented from sliding and tipping by lashing/strapping or blocking or by a combination of methods in order to withstand the accelerations, deceleration and centrifugal/lateral forces generated during transport. Securing must be done in such way that the materials used for cargo securing do not damage the cargo. Some illustrations will be provided in this section, however more elaborate examples/situations can be found in Appendix 3: *Fact sheets.*



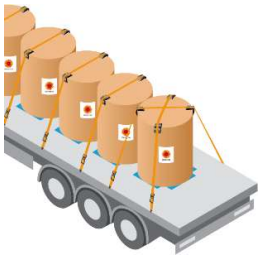
Forces in road transport

For USA specific guidelines, cf. 4.5.7

When the cargo is not loaded against the headboard, is not form-fitting (hence with 'free' space(s)) or is partly stacked; extra securing is required towards the front and back. This can be achieved in one of multiple ways:

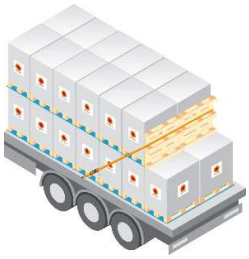


Panel/frame blocking



Cross-lashing

Regular spring lashing



Spring lashing with pallet(s)

Before the driver leaves the loading site, all responsible parties must check if the load securing is performed according to this Manual. The securing of cargo units must be checked regularly by the driver during the journey and after heavy braking or other abnormal situations during the trip. Cargo securing must also be verified after additional loading or unloading during the journey.

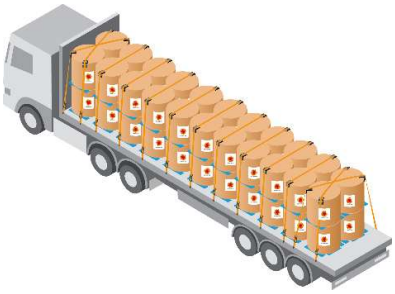
When using special equipment, such as but not limited to trailers with walking floors, cargo securing should be done according to certified methods and loading patterns.

4.5.1. **Reels**

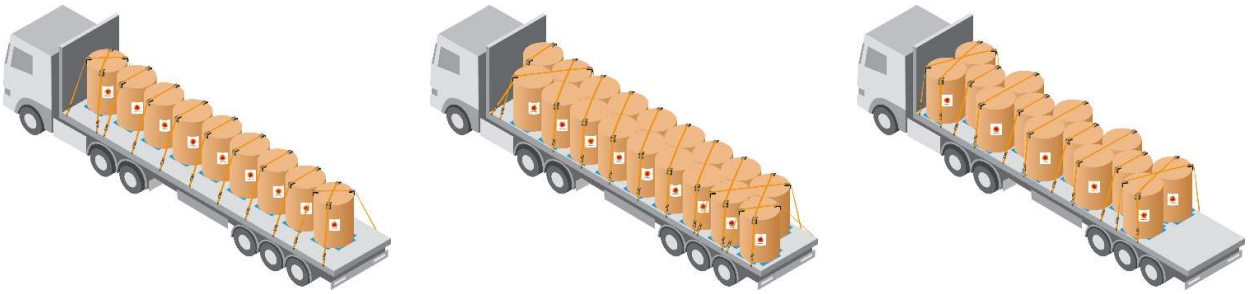
4.5.1.1 Standing reels

Standing reels must be secured with one or two lashing belts/unit (combination of cross-lashing and regular top-over lashing), depending on the position and weight of the units or section. A cross-lash (with 2 lashing belts) is always required on the first (stacked) and last unit(s).

Two or four correct edge protectors (depending on number of belts) and two anti-slip mats must also be used per reel. On the last reel, a third anti-slip mat is to be placed parallel with the axles. Anti-slip mats must also be places between stacked units.



Correctly secured standing reels



Examples of securing of standing reels

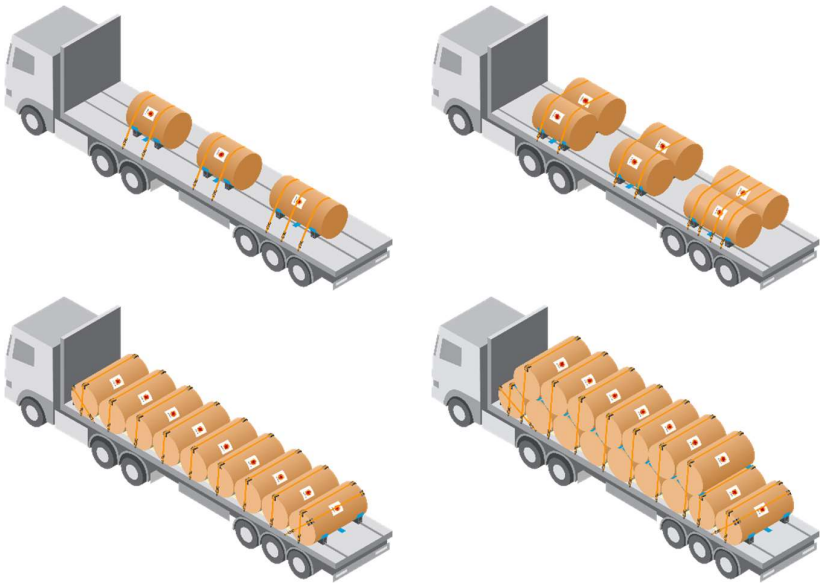
4.5.1.2 Laying reels

When reels are laying lengthwise (longitudinal/shotgun), several belts per unit must be used to secure the reels.

The weight of the cargo being secured determines the number of belts needed according to the following table:

Weight of cargo (kg)	No. of belts
< 5000	3
5000 – 7500	4
7500 – 10000	5
>10000	6

For paper liners, 2 metal chocks are positioned on both sides of the trailer. Anti-slip mats need to be placed on top of the chocks and additionally at least 2 anti-slip mats needs to be used per reel.



Examples of securing of laying reels

Alternatively, loop lashing or the use of special equipment available for securing and transporting horizontal reels, such as Cargo Chock "CC125®"; 4 specialized chocks, connected via lashing belt, are to be used with anti-slip underneath and on top. The lashing belt must be 'free', by placing 6mm thick anti-slip mats on both sides of the belt for each unit. One or 2 additional mats can be placed per reel.
The chocks should be positioned approx. 25 cm from the reel's end.

In case 2 units are loaded next to one another, a standard chock needs to be positioned between the units to prevent rolling during the loading & unloading process.

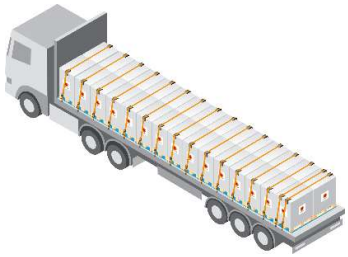
When reels are laying parallel to the axles, they must be secured with minimum one belt per unit, two edge protectors and anti-slip mats. Note the correct positioning of the edge protectors. The last and first reel is to be secured by one additional belt as a direct lashing.
If there are two layers of laying reels ('saddle'), anti-slip mats must be placed between layers. Wedges must be placed to prevent rolling towards the front and/or back.

4.5.2. **Pallets**

Two or more edge protectors (depending on number of belts) and two anti-slip mats must be used per pallet. The last row is always to be secured with 2 lashing belts.

Empty spaces between pallets must be eliminated and if this is not possible, fillers are to be used in the gaps, e.g. empty pallets and/or airbags.

If units are not loaded against the headboard, are partly stacked or in case of larger open spaces, additional securing is needed (e.g. spring lashing or blocking (cf. Illustrations 4.5)).



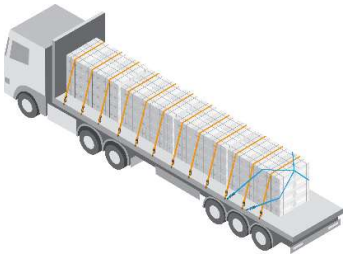
Securing of pallets

4.5.3. **Pulp**

Pulp units are secured by top-over lashing, using at least one belt per unit and ideally also edge protection. Anti-slip mats can't be used as they will adhere to the pulp. The last row is always to be secured with 2 lashing belts or alternative blocking.

If units are not loaded against the headboard, additional lashing in the forward direction is needed (e.g. spring lashing).

Fluff-pulp is secured with top-over lashing, similar to paper/board reels. Both edge protection and anti-slip mats are to be used.



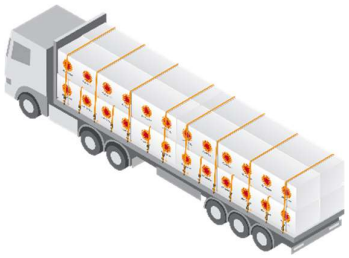
Securing of pulp

4.5.4. **Timber packages**

Timber packages must be secured with top-over lashing, preferably using edge protectors. A minimum of one belt for every meter of timber package is required. A suitable amount of dunnage must be placed sidewise (not lengthwise) under the packages.

In some cases, when multiple layers are loaded, it might be required to use intermediate lashing in combination with top-over lashing.

If packages are not loaded against the headboard, additional lashing in the forward direction is needed (e.g. spring lashing).

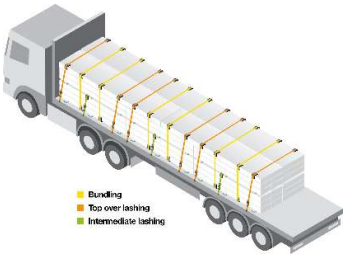


Securing of timber packages

4.5.5. **LVL/CLT**

To achieve optimum load securing; anti-slip mats, edge protectors and lashing belts must always be used. If possible and depending on load configuration, the panels must be loaded against the headboard of the trailer. Overhanging pieces will need to be supported by fixed and secured dunnage to prevent bending.

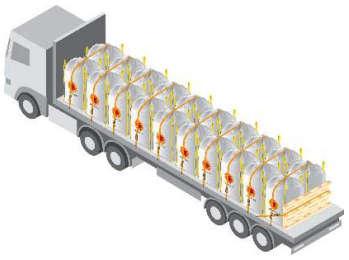
Anti-slip mats need to be fixed on both sides of the dunnage. A sufficient amount of top-over lashings in combination with bundling and/or intermediate lashing is to be utilized. Edge protectors must be used to prevent damages to edges. This is particularly important with visual elements/panels.



Securing of LVL/CLT

4.5.6. **Big bags**

Big bags are to be secured by cross-lashing, or alternatively by using tarpaulins or cargo nets intended for the purpose.



Securing of big bags

4.5.7. **Load securing in USA**

- Ref. Paper Reels: 49 CFR § 393.122
- Ref. Palletized Cargo / General Securement: 49 CFR § 393.102 & § 393.106

In the United States, closed box (dry van) trailers are most commonly used for transporting paper reels and palletized cargo. These trailers must comply with the safety standards of the National Highway Traffic Safety Administration (NHTSA) and the Federal Motor Carrier Safety Administration (FMCSA).
According to FMCSA cargo securement regulations (49 CFR, Subpart I), all cargo must be secured to prevent shifting or falling during transit. Securement systems must withstand the following minimum force requirements:

- Forward force: 0.8 × cargo weight (braking)
- Rearward force: 0.5 × cargo weight (acceleration)
- Sideways force: 0.5 × cargo weight (cornering)
- Upward force: 0.2 × cargo weight (road vibration)

Where cargo is loaded form-fitting within the trailer, these requirements are often met by placement against walls and other cargo. When not fully contained, § 393.102 and § 393.106 specify that securement systems must apply a downward force equal to at least 20% of the cargo weight, with devices (straps, chains, bracing, or friction mats) meeting prescribed working load limits (WLL) and maintained in serviceable condition.

Paper Reels - § 393.122

- Standard configuration: Reels are typically loaded upright on the trailer floor.
- Oversized reels (greater than 106" in height): Should be loaded horizontally inside cradles to stabilize and prevent rolling.
- For reels ≥ 5,000 lbs (2.268 kg):
    - Must be tightly placed against walls, other reels, or pallets.
    - If voids exist, additional securement is required:
        - Bracing with adjacent reels or pallets to eliminate gaps.
        - Tiedowns with aggregate WLL ≥ 50% of the reel's weight.
        - Friction mats or anti-slip materials when reels are loaded crosswise or with voids.

Palletized Paper Cargo - § 393.102 & 393.106

- Pallets should be tight-packed, squared, and aligned within the trailer.
- When not form-fitting, securement must include:
    - Tiedowns or straps to anchor pallets in place, meeting WLL standards.
    - Air bags, friction mats, or blocking to fill gaps and reduce movement.
- Palletized cargo must be stable enough to withstand the FMCSA performance criteria above.

Driver Inspections – § 392.9
Cargo securement must be inspected before departure, within the first 50 miles, and at least every 150 miles or 3 hours during transit.

4.6 Transport security

During road transport, the trailer shall not be left unattended so that the possibility of intruders gaining access to the transport unit and the cargo is prevented. In case the driver leaves the truck/trailer, the vehicle/cabin should always be locked.

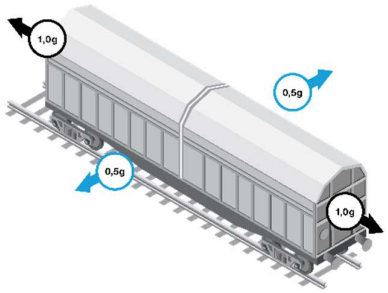
The route should be planned so that the driver can take the mandatory breaks and rests in a safe and controlled location.

5. RAIL TRANSPORT

The supplier must ensure that the dispatched wagons are equipped, maintained and fulfilling the following requirements:

- Wagons must be inspected frequently and repaired by an Authorized Maintenance Company.
- Maintenance of engines and wagons is to be performed at regular intervals and in accordance with local rules, legislation and requirements.
- All maintenance and repair is to be conducted in an environmentally sound manner and well documented.
- Wagons must be in good condition, adapted to rail track conditions.
- Engines and wagons must be in line with local rules, legislation and requirements.

In comparison to sea and road transport, the forces that come into play when transporting cargo via rail can be much bigger. Especially when shunting wagons, the forces can reach up to 4g. Therefore appropriate measures need to be taken to ensure safety and avoid damage to the cargo. Note that a force of 1g is to be considered for wagons which are not subjected to shunting, are used in combined transport or that are fitted with long-stroke shock absorbers.



Forces in rail transport

5.1 Inspection of a transport unit

The aim of the inspection, performed by the supplier or Stora Enso employee, is to safeguard that the cargo will be received undamaged and in compliance with AEO requirements for supply chain safety and security, i.e. to confirm that the transport unit is not used for any illegal activity, such as smuggling. The inspection may be performed visually or by using necessary tools. Any suspicious alterations in the structure of the transport unit must be reported to Stora Enso.

If a transport unit does not meet the below listed requirements, it will be rejected until it meets the quality standards. Costs arising in relation to a rejected transport unit will be paid by the carrier/transport unit provider. The carrier/transport unit provider will release the empty transport unit according to Stora Enso's guidelines and instructions. Long-term rented wagons need to be maintained, serviced and repaired by Stora Enso.

5.1.1. **Cleanliness**

The transport unit must be entirely clean before any loading of Stora Enso cargo occurs. The wagon floor must be swept and cleared of any debris. It is of the utmost importance that the cargo unit/space is free from any stones, dust, nails, remains of previous cargo, pieces of wood, insects, etc. that could possibly damage the cargo.

5.1.2. **Water tightness**
Stora Enso requires that closed transport units are completely watertight. The cargo space must be and remain dry at all times. Hence, the importance to check the roof, sides, lashing points, doors and floor for any damage that could make it possible for water to enter the transport unit. Any damage must be repaired in a professional and durable way before any loading of Stora Enso cargo occurs. Dampness of the cargo space will not be accepted and can lead to a rejection of the transport unit.

5.1.3. **Floor**
The floor needs to be even and strong enough to withstand/allow the use of loading/unloading equipment such as forklift trucks. The floor must withstand a minimum of 5 tons/m.

5.1.4. **Sides and roof**
The sides and roof of the transport unit must be in good, sound condition and watertight. Furthermore, the sides must be even and free from any protruding objects. For curtain side wagons, also the opening and closing function of the tarpaulin must be in a proper working condition.

5.1.5. **Doors**
The doors, gaskets and locks are all to be in a proper working condition, 100% watertight and ensure that the cargo space can be completely closed off. For certain destinations, the use of seals is required.

5.1.6. **Odour**
The transport unit must be completely free of any odour/smell, which might contaminate Stora Enso's cargo. Strong odour from previous cargo, e.g. tea, rubber, perfumes, leather, spices, fish and chemicals may easily adhere to the cargo.

5.2 Loading of a transport unit

5.2.1. **Load planning**
The load planning must always be done according to the allowed maximum weight stipulated by each country. The same goes for the overall weight distribution and maximum axle load.

When planning, a safety distance of approx. 10 cm must be kept from doors and walls to avoid damage when opening and closing these.

Loading bridge/ramp and load extender

5.2.2. **Maximum payload**
The maximum payload per transport unit/railcar is displayed on the unit itself. However, the national railway regulations must also be considered and followed.

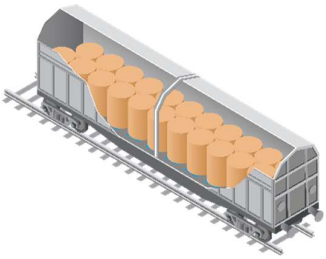
5.2.3. **Weight distribution**

The weight of the cargo must be distributed evenly over the entire cargo space. Maximum axle weight is not to be exceeded.

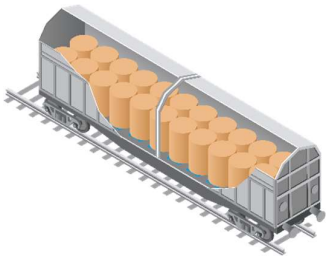
5.2.4. **Loading patterns**

5.2.4.1 Reels

Standing reels can be loaded in several ways:

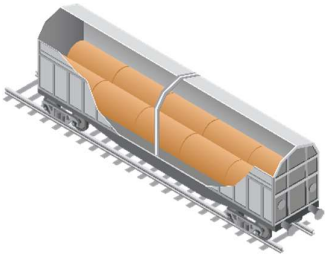


Standing reels, nested/zig-zag in wagon



Standing reels, straight in wagon

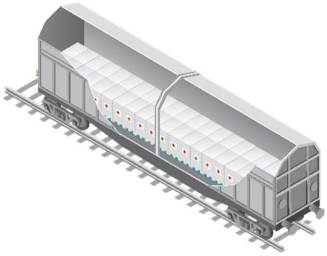
Laying reels can be loaded:



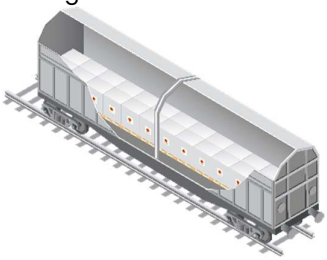
Laying reels in wagon, lengthwise

5.2.4.2 Pallets

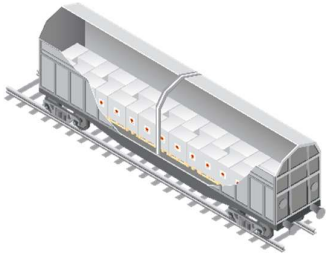
Pallets can be loaded in several ways, depending on the size etc.:



Long sides parallel to the wagon's axles



Short sides parallel to the wagon's



Block-formation in wagon

5.2.4.3 Pulp

Pulp bales can be loaded in several ways. The aim is to always minimize the amount of empty space in the wagon.

Fluff pulp is loaded similar to paper/board reels. The pattern is based on the ordered size and diameter of the units. No other cargo can be loaded together with fluff-pulp.


Pulp in wagons

5.2.4.4 Timber

Timber is always loaded lengthwise using a suitable amount of dunnage. The number of lashing belts used depends on the availability of lashing points in the wagon and must be in accordance with local regulations.

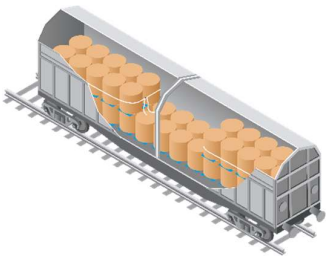
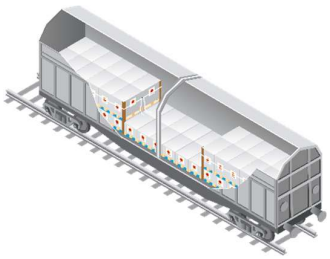
Timber in wagon

5.3 Cargo securing

During the transportation and handling process, all international or national rules and regulations, as applicable, as well as instructions issued by railway companies must be followed, such as the UIC guidelines.

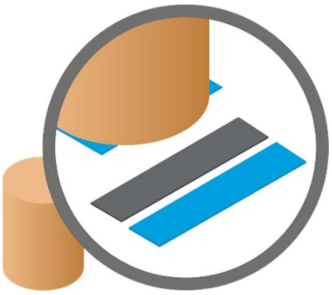
Cargo securing can be done by blocking and/or the placing of anti-slip mats or other securing materials.

Cargo securing needs to be done at all times by the loader, as it will prevent the cargo from moving during transport and withstand accelerations, decelerations and centrifugal/lateral forces generated during transport.

Securing second layer of cargo

New anti-slip material needs to be available upon loading to cope with the longitudinal forces. Reused mats are not accepted. Generally there are two types of anti-slip mats frequently used to increase friction and prevent cargo from moving during transport. A heavier 'black' type, made from rubber (such as Regupol®), with a friction coefficient of 0.7µ. The lighter 'blue' version, made of foam (Transpofoam®), has a friction coefficient of 0.8µ. Both are approved for use with Stora Enso cargo. Other friction increasing materials are accepted as long as they fulfil a minimum friction of 0.65µ. Anti-slip mats used must be clean, dry and without any defects.



Anti-slip mats

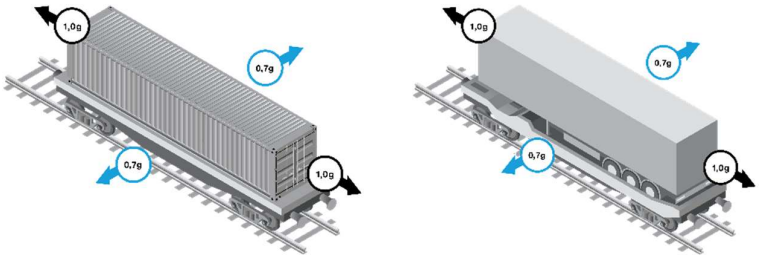
Anti-slip mats, at least 150 mm wide and maximum 4 mm thick, must be placed on either side of the cargo lengthwise. For reels, the mats must protrude app. 1 cm. In case of multiple layers, anti-slip mats are to be placed in-between units unless they have friction-end caps.

For certain destinations, the transportation forces are greater than normal, hence more thorough securing is required. Wooden frames, airbags and belts are commonly used in these cases. Various ways of securing cargo in wagons are illustrated below:

Various methods of securing in wagons

6. MULTIMODAL / INTERMODAL TRANSPORT

Multimodal transport consists of the transportation of cargo (under a single contract) in a container or trailer, using multiple modes of transport (e.g., rail, sea, and road), without any handling of the cargo itself when changing modes. This method reduces cargo handling and damage.



Multimodal/Intermodal transport

Intermodal transport also consists of the transportation of cargo in a container or trailer, using multiple modes of transport without any handling of the cargo itself when changing modes. However, for each transport mode a different contract is made with a different supplier.

Where multiple suppliers are responsible for individual transport modes, the Manual applies to each supplier for the specific transport mode they are providing. Where multi-modal transportation is involved, e.g. a single supplier is responsible for more than one transport mode, then the Manual applies to that supplier for all transport modes they are providing. For example if both road and rail transportation is to be provided, then the handling and securing requirements of both the road and rail sections of the Manual must be complied with.

The supplier can refer to the CTU Code, there is comprehensive information and references on all aspects of loading and securing of cargo in containers and other intermodal transport, taking into account the requirements of all sea and land transport modes. The CTU Code applies to transport operations throughout the entire intermodal transport chain and provides guidance not only to those responsible for packing and securing cargo, but also to those who receive and unpack such units. The CTU Code also addresses issues such as training and the packing of dangerous goods.

The CTU Code is intended to assist the industry, employers' and workers' organizations as well as governments in ensuring the safe stowage of cargo in containers. The CTU Code was issued as an MSC circular (MSC.1/Circ.1497) and it can also be downloaded from a dedicated website:
https://www.unece.org/fileadmin/DAM/trans/doc/2014/wp24/CTU_Code_January_2014.pdf

No additional steps or materials are to be taken or used when it comes to the securing of cargo for inter- or multimodal transport. The cargo securing instructions, set out in the above sections, are sufficient and must be adhered to. Only one exception exists and this is related to trailers that go inter- or multimodal, where new anti-slip mats must always be used.

7. CONTAINER TRANSPORT

A container is a standard size unit base for carrying cargo in a uniform manner. Dry cargo containers are widely used for transporting of forest products. Transport by container vessel begins with the ordering of the correct container followed by inspection, correct loading and securing of the cargo.

Containers can be subject to harsh treatment when handled at the container terminal or on trucks, e.g. breaking, sharp turns and driving on uneven ground. Containers may be set down so hard that their load securing device becomes highly stressed before the journey begins. Stresses on the cargo in the container during unloading and loading have increased with the modernization of gantry cranes.

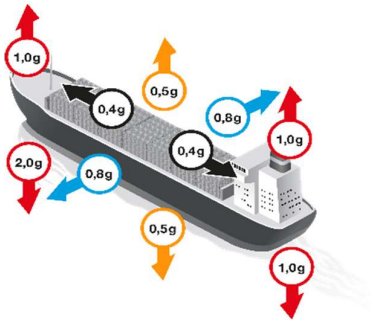
20′ container

40′ container

45′ container

The stresses involved in sea transport pose particular challenges to the safety of the cargo units and cargo securing measures. The effects of bad conditions at sea are similar to those of a truck breaking sharply in normal traffic conditions. The container is subjected to brief peak loads and repetitive stresses, e.g. rolling motions of the vessel that can have an impact on the cargo for days.

In serious cases, some of the cargo in the container may slide into the gaps between the cargos due to rolling motion. If the entire cargo "settles", the existing voids can become one large gap. This can cause the cargo to build up high kinetic energy. After a certain time, the container is no longer able to absorb these continuous forces and becomes seriously damaged. Consequently, the cargo subjected to these conditions can be rendered completely useless.



Forces in sea transport

The quality of overseas transport is determined already when ordering a container. Basic 20´ and 40´ dry containers are suitable for paper, board, pulp and wood products transportation when Stora Enso quality requirements are met. Also high cube, wide door opening, heavy payload, open top and non-operating reefer containers as well as flat racks might be requested in case needed. Container dimensions may vary depending on manufacturer. Measures in below table are indicative:

	20’ standard	40’ standard	40’ high cube	45’ pallet wide
Internal (mm)				
Length	5 900	12 034	12 034	13 624
Width	2 352	2 352	2 352	2 420
Height	2 393	2 395	2 700	2 687
Door opening (mm)				
Width	2 340	2 340	2 340	2 360
Height	2 280	2 280	2 585	2 580
Weight (kg)				
Max gross	30 480	30 480	30 480	34 000
Tare	2 230	3 720	3 900	4 980
Max cargo	28 250	26 760	26 580	29 020
Volume (m³)	33.2	67.8	76.4	85.25

7.1 Inspection of the container

Stora Enso quality requirements for containers are based on UCIRC (Unified Container Inspection and Repair Criteria) inspection criteria set by the International Chamber of Shipping. In addition to those instructions, industry specific requirements must also be considered when accepting the container for loading.

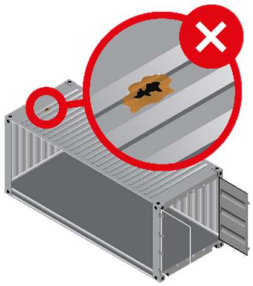
The aim of the inspection is to safeguard that the receiver will get the cargo undamaged but also to comply with AEO requirements for supply chain safety and security. Note: It is not allowed to load an uninspected container.

The following items must be checked by the container depot upon releasing empty equipment. The truck driver picking up the empty unit shall double check and a final check is required by the stuffing partner and/or Stora Enso employee before loading. If a container does not meet the below listed requirements, it will be rejected. Stora Enso will not accept any costs in relation to a rejected container.

Container must be thoroughly checked prior to loading

7.1.1. **Water tightness**

Water tightness can be easily checked by entering the container and closing the doors. Check the roof, floor, walls, corners and doors carefully. If any light penetrates, then this indicates that the container is not completely watertight. Also spots or stains on the floor might be signs of potential leakage.

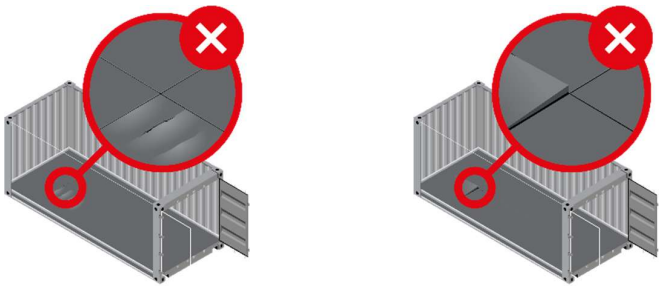


Hole in the roof

7.1.2. **Floor**

The floor of a container must be undamaged, even and dry. The floor may not have oil/water stains, which can contaminate the cargo. The floor must be strong enough to allow loading/unloading equipment such as forklift trucks and be checked for protruding nails or bolts. Floor strength must comply with ISO standard 1496-1:2013 as a minimum.

When stuffing reels only 5mm difference in height between adjacent floor planks/panels is allowed without extra protective measures. Note that this is an exception to UCIRC Table 3.1 regarding floor planks and panels.



Deformation and cracking of the floor

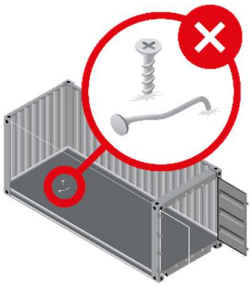
7.1.3. **Cleanliness**

Container must be clean from any (loose) debris such as wood splinters, stones or dirt as well as ingrained cargo residues such as plastic granules. Nails and/or screws need to be removed.

Special attention is to be paid to any infestation such as flies, bugs, termites, etc.

Also seasonal measures might be applicable for certain markets, e.g. the 'brown marmorated stink bug' precautions for Australia & New Zealand.

Sweeping of loose debris



Nails/screws in the floor

Water/oil on the floor

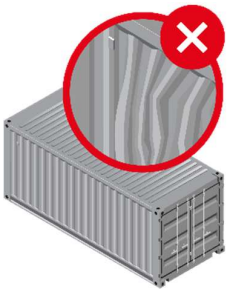
Insects in container

7.1.4. **Walls**

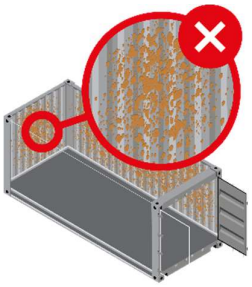
Deformations such as dents, bends or bows are not acceptable if they reduce the internal width by more than 50mm from the inner corrugation or 70mm from the floor to the roof corrugation.

In addition, deformation of any size is not acceptable if the shape itself creates a risk for cargo damage.

Containers with rusty walls are not to be accepted.



Deformation



Rust on container walls

7.1.5. **Doors**

The doors of the container must close and lock easily. Holes, cuts, tears, breaks or cracks in components or welds, as well as any deformation affecting security and operation of doors, are not allowed. Door handles must be in proper condition to be secured/closed.

The door gaskets must be in good condition and, to prevent leakage, there may not be any corrosion damage.

Rust on doors

7.1.6. **Odour**

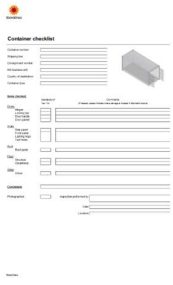
The container must be odourless, otherwise it needs to be rejected. Strong odour from previous cargo, e.g. tea, rubber, perfumes, leather, spices, fish and chemicals may easily adhere to the cargo. Containers must always be equipped with vent holes and it must be ensured that these are not closed by tape or other means.

Odour

7.1.7. **Container checklist**

It is strongly recommended that the *Container Checklist* is used in order to verify and document the condition of the empty transport unit. Deviations must be noted to avoid disputes at later stages in the delivery.

The *Container Checklist* is outlined in the Appendix 4 and is available on https://www.storaenso.com/en/suppliers/logistics-services/logistics-supplier-information.



Container checklist

7.2 Container stuffing

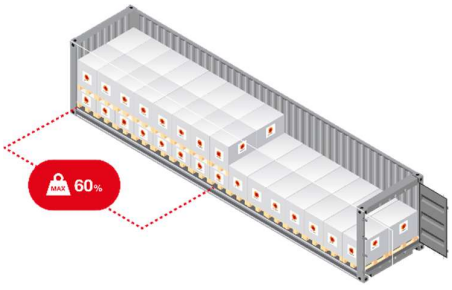
Cargo must be inspected before stuffing by the supplier or Stora Enso employee. Damaged cargo must be reconditioned or rejected according to the instructions in section 5 of this Manual. Reconditioning must be carried out immediately as to avoid contamination and to ensure the unit will make the original shipment. Damaged cargo is not allowed to be stuffed without the permission of Stora Enso Logistics.

Prior to stuffing, the supplier must always check if there are market-, customer- or order specific instructions to be considered.

7.2.1. **Planning**

A stuffing plan should be prepared before operation. The cargo must be stuffed tight into the container and the payload must be maximized according to weight limitations (country, customer or any other limitation) also taking into account the axle weight for the transportation to and from the container terminal.

The container must be loaded so that it is balanced lengthwise and sideways (longitudinal/latitudinal). No more than 60% of the weight may be placed in 50% of the length of the container, i.e. gravity point is located +/- 10% from the centre of the container.



Weight distribution in container

7.2.2. **Loading patterns**

Proper utilization of the cargo space has a great impact on payload. The loading pattern must always be planned so as to maximize payload.

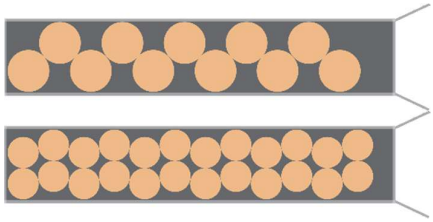
7.2.2.1 Standing reels

Reels are always loaded on their ends (standing), unless otherwise instructed. The below table can be used to determine best possible utilization of the cargo space for standing reels. With heavy reels and when the whole cargo space cannot be utilized, it is important to spread the load to balance the container while ensuring every reel is still properly locked and secured.

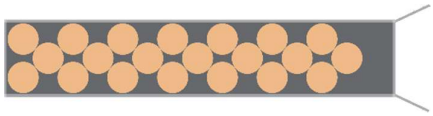
Vertical loading of reels in 40' container
(L: 12050, W: 2340 mm)

Diameter (mm)	No of reels Bottom row	Loading pattern
750	48	B
800	44	B
820	42	B
850	41	B
860	39	B
900	32	B
930	29	A
960	26	A
1000	24	A
1050	22	A
1100	22	A
1150	20	A
1200	19	A
1250	18	A
1270	16	A
1300	14	A
1350	12	A
1400	11	A
1450	10	A
1500	9	A
1530	9	A
1550	8	A
1600	8	A
1650	7	A
1750	7	A
1800	6	A
1900	6	A
2000	6	A

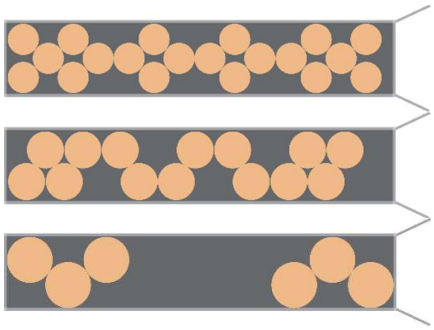
Loading pattern A



Loading pattern B



Special cases to balance container when limited number of reels



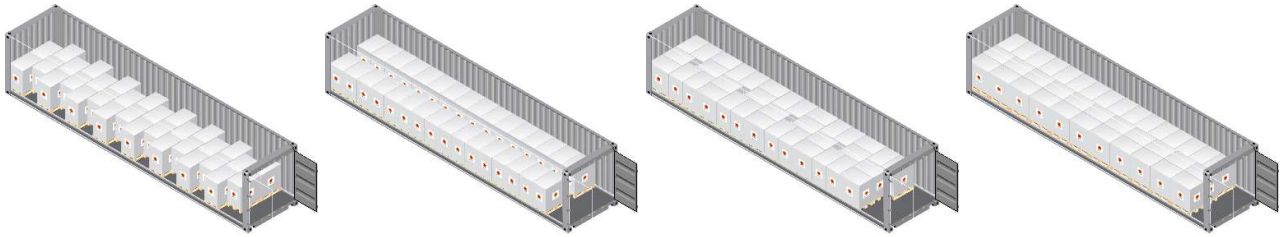
7.2.2.2 Laying reels

In some cases, the customer requires that reels be loaded horizontally. If proper equipment is not available at the receiving end, unloading requires rolling the reels out of the container and this must be taken into account when loading occurs. The width of horizontally loaded reels must be smaller than the width of the container door opening. Occasionally, large width reels may need to be loaded horizontally and along the length of the container.

Horizontally loaded reels

7.2.2.3 Pallets

The loading pattern must be designed so that the load supports itself as much as possible. Empty space between pallets and container sidewalls must be minimized and split so that it is equal on both sides of the container. The sum of void spaces may not exceed 15 cm. Otherwise, the pallets must be loaded along the container walls with the empty space in the middle which needs to be filled/secured by using airbags, timber or other filler material.



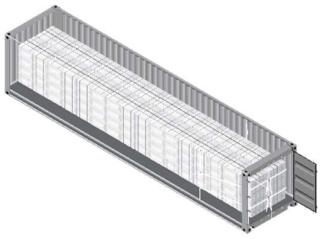
Loading patterns for pallets in a container

7.2.2.4 Pulp and timber

The same principles must be considered with pulp bales as with palletized cargo.

For fluff pulp, the loading patterns as set out above for standing reels are to be considered.

Standard timber packages are loaded against container front and side walls, and packages usually fill the whole cargo space.



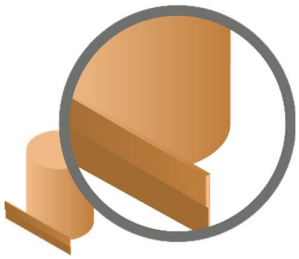
Pulp in a container

Timber in a container

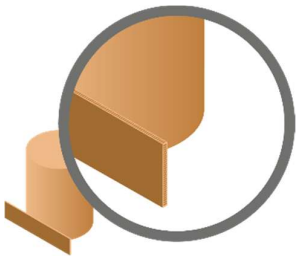
7.2.3. **Cargo protection and securing materials**

Paper and board reels are often damaged by bottom rails and/or lashing rings of the container. The cargo must be protected along the container sides by using sufficiently strong material, such as plywood, honeycomb board, hardboard or corrugated board.

Basic protection and securing materials for containers include flat- or honeycomb board, raisers and lashing belts with a capacity of at least 2000 kg. Materials used for cargo protection and securing must always be stored in a dry and clean place.
If a container is destined to a country where wood treatment quarantine regulations apply, care must be taken that all wood in the container, packaging and cargo complies with the International Standards for Phytosanitary Measures, No. 15 (ISPM 15). This standard covers packaging materials made of natural wood such as pallets, dunnage, crating, packing blocks, drums, cases, load boards and skids. Approved measures of wood treatment are specified in Annex I of ISPM 15.

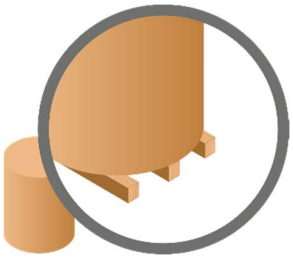


Sideboard flatboard



Sideboard honeycomb

Belts for lashing



Raiser

- The first reels or reel stacks against the front wall must be loaded on raisers or similar. Raisers must be placed lengthwise in the container. Used material must be approved by Stora Enso prior to loading.
- Hardboard, honeycomb board or similar are always to be placed on the sides if reels are not loaded on raisers.
- Reel protection needs to be added whenever there is a risk of damage due to the container door.
- Check customer, order and country related special instructions and limitations.

7.2.4. **Securing of the cargo**

During transport the container may be subjected to vertical, longitudinal and transverse accelerations, which cause forces to each unit proportional to its mass. These forces may easily exceed the capability of static friction and tilting stability, so that cargo may slide or tilt over. The securing of cargo must therefore aim to minimise the risk of sliding or tilting.

Securing needs to be particularly effective if the cargo does not fill up the whole container space. Good planning of the container loading pattern considerably reduces the need for securing. The securing method also depends on the cargo and cargo mix in the container, and must always be considered on an individual basis. Securing must be done so that the material used for securing does not damage the cargo.

The Code of Practice for Packing of Cargo Transport Units (CTU Code), jointly developed by the International Maritime Organization (IMO), the International Labor Organization (ILO) and the United Nations Economic Commission for Europe (UNECE), addresses these concerns through a non-mandatory global code of practice for the handling and packing of cargo transport units for transportation by sea and land.

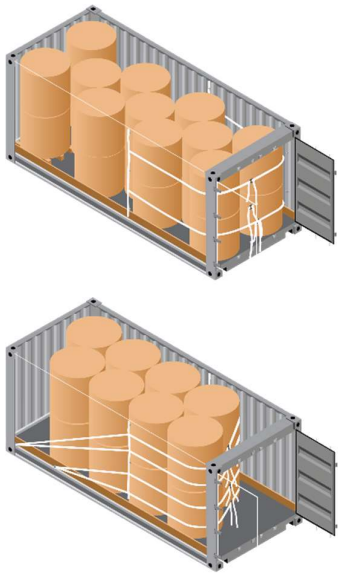
The supplier can refer to the CTU Code, which provides comprehensive information and references related to all aspects of loading and securing of cargo in containers and other intermodal transport, also taking into account the specific requirements of all sea and land transport modes.

7.2.4.1 Standing reels

Vertical belts are first attached to the lashing rings, after which a sufficient number of horizontal belts (1 per layer) are used to keep the cargo in place. The evaluation of sufficient securing arrangements must be done based on the cargo characteristics and the strength of the lashing belt.

Single use belts with removable tensioning and locking devices are the most commonly used belts. Lashing capacity (LC) of the used belt(s) must always be taken into account when calculating necessary securing arrangements.

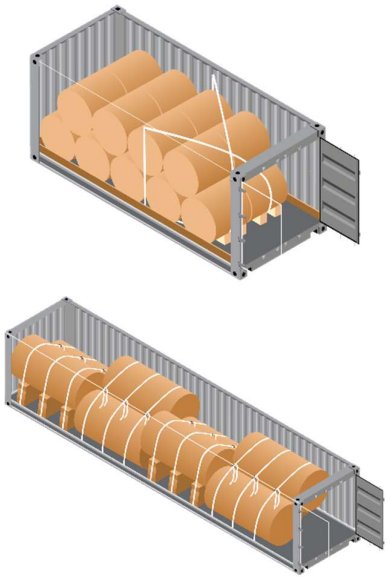
Step-down can be used when reels of equal width are loaded in two layers in part of the container. Securing is done by lifting the adjacent reel higher by placing raisers underneath it. The adjacent reel secures the top layer. The container must always maintain its balance. The raisers must not overlap the reel diameter, otherwise damage is caused to adjacent reels. Step-down securing alone is not sufficient, and belts must be used to prevent the cargo from moving.



Correct securing of reels in a container

7.2.4.2 Laying reels

There is a high risk that horizontally loaded reels move during transport. The principle securing method is to use chocks in every row in addition to belts which are extended over the load. The height of the chocks must be at least one-eighth of the reel diameter. Reel stands can be used when large width reels are loaded lengthwise in laying position to maximize payload and avoid stress on the container walls. It's of the utmost importance that those reel stands are positioned correctly and free from any damage.



Correct securing of reels in a container

7.2.4.3 Pallets

Vertical belts are fastened to the container's lashing rings and every pallet layer is kept in place with horizontal belts. Corner profiles must be used between the belts and pallet sides.

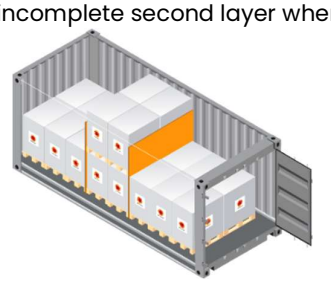
When pallets are loaded partly in one and partly in two layers, the upper layer must be secured with belts, or alternatively blocked by using timber, raisers or boards. Where the space between the pallets and container sidewalls surpasses 15 cm, the empty space must be filled/secured. When loading in two layers, it might be necessary to use plywood boards between layers to stabilize the stowage.

Correct securing of pallets in a container

For palletized cargo there are different ways to block an incomplete second layer when necessary.

Threshold by height. High pallets used to secure cargo.

Threshold by elevation. Pallets raised to secure

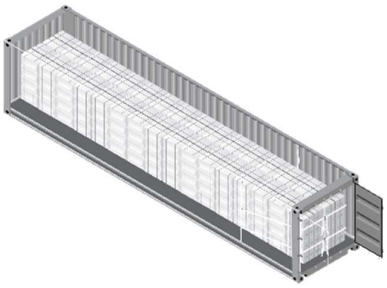


Threshold by pane. Board used to block pallets.

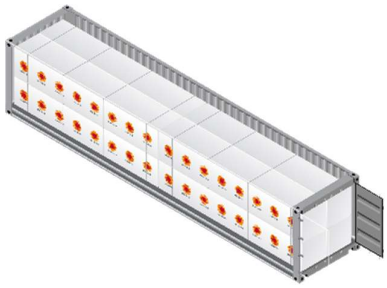
Round turn lashing used to secure stacked pallets.

7.2.4.4 Pulp and timber

Pulp units are stuffed in various ways, depending on their dimensions and transport unit. Stability of the unit(s) and tightness of the stowage must be considered when evaluating necessary securing arrangements. The front end at the door must always be secured with lashing belt(s). Sideways movement has to be prevented when necessary, as per CTU guidelines by stowage planning, blocking or securing.



Pulp stowage

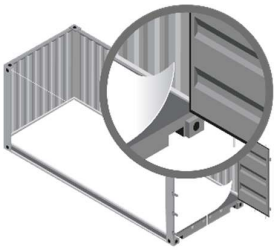


Timber stowage

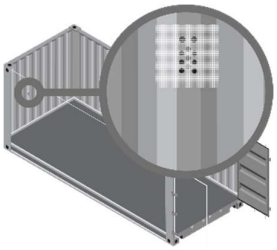
Standard timber packages should be loaded against the container rear wall. Ideally the packages are planned dimensionally to fill the cargo space thus no additional securing is required. The need for additional securing measures should be considered in case excess empty space is left inside the container

7.2.5. **Special instructions**

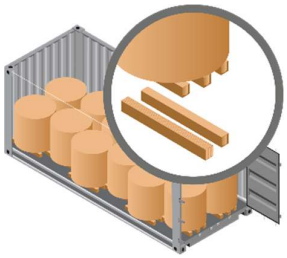
Some of the markets or customer segments served are more sensitive and demanding than others. Special instructions can include requirements such as:



Protective board on the floor of the container



Insect prevention nets on ventilation holes



All reels on pallruns/wellpads

Side protection on container walls

7.2.6. **Container sealing**

Containers carrying Stora Enso cargo must be sealed using high security seals, i.e. seals marked “H” as defined by the ISO 17712 standard.

High security seal for

8. SEA TRANSPORT

The International Maritime Organization (IMO) develops and maintains a comprehensive regulatory framework for shipping covering safety, environment, legal, technical maritime safety, etc. When transporting Stora Enso cargo, these IMO regulations and guidelines must be complied with at all times. Additionally, the shipping line's instructions and guidelines must also be considered and complied with.

Different vessel types are suitable and used for transportation of Stora Enso cargo. The type and construction of the ship dictates the method of loading (E.g. RoRo, StoRo, LoLo) and determines the method of stowage.

Qualifying vessels:
Vessels must be mechanically self-propelled vessels of steel construction classed with a Classification Society which is

- A member of Associate Member of the International Association of Classification Societies (IACS), or
- A National Flag Society[1], but only where the vessel is engaged exclusively in the coastal trading of that nation (including trading on an inter-island route within an archipelago of which that nation forms part).

Age Limitation:

- Vessels which have been used for the carriage of general cargo on an established and regular pattern of trading between a range of specified ports, and do not exceed 25 years of age, or
- Were constructed as containerships, vehicle carriers or double-skin open-hatch gantry crane vessels and have been continuously used as such on an established and regular pattern of trading between a range of specified ports, and do not exceed 30 years of age.

8.1 RoRo (Roll-on/Roll-off)

Cargo is loaded on transport units that are driven or pushed/pulled on board via the ship's stern ramp. This type of loading can be performed very quickly, as the transport units have been loaded upfront, reducing the port-time of the vessel. This type of loading reduces the overall carrying capacity of the vessel, compared to breakbulk.

[1] A national Flag Society is a Classification Society which is domiciled in the same country as the owner of the vessel in question which must also operate under the flag of that country.

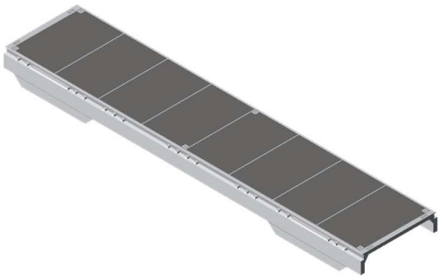
8.1.1. **Transport units**

Several types of transport units are used in RoRo traffic, all of which are preloaded and driven on board; e.g. roll trailers, cassettes, SECUs (= Stora Enso Cargo Unit) and SEFUs (= Stora Enso Flatbed Unit)

8.1.1.1 Roll trailers and cassettes

The surface of these units can consist of steel or a combination of steel and wood. Several types of roll trailers and cassettes are in use, each with its own specific dimensions. The maximum load capacity is always indicated on the side and must be respected.

Roll trailer



Cassette

8.1.1.2 SECUs

The Stora Enso Cargo Unit is a weather-protected cassette (not an ISO-container) and is handled in exactly the same way. Cargo securing should be done based on type of cargo and loading pattern.

There are two types of SECUs in use, an automatic loading/discharging version with profiles in the floor (grey SECU) and a conventional version with even, wooden floor (red SECU).

Grey SECU (automatic)

Red SECU (manual)

The dimensions, weight, loading capacity and maximum payload of the SECUs is set out below:

SECU – Dimension, weight and loading capacity

Dimension	External	Internal	Door opening
Length	13,800	13,576	
Width	3,600	3,430	3,430
Height	4,375	3,437	3,393

Loading capacity		Maximum payload with SECU positioned on rail wagon (Stax 25t)	
Volume	160 m^3	Weight rail wagon	18,400 kg
Number of Euro-pallets per layer	44 units	Manual	68,100 kg
Maximum gross weight	93,000	Automatic	67,040 kg
Tare weight (manual)	13,500	Floor strength	13,0 t axel load
Tare weight (automatic)	14,560	Floor material	Wood
Maximum payload sea	79,500 (man)	Lashing rings	Yes
Maximum payload sea	78,440 (aut)		

It is of the utmost importance that SECUs are handled properly and with great care. When transporting a SECU, the maximum speed limits must be respected. Before tugging, the SECU must be lifted off the ground. The same applies when lowering it, i.e. movement must have completely stopped prior to lowering the SECU. This way the wear and tear of the SECU's feet can be minimized and expensive repair work avoided. When docking the SECU for loading, it needs to be ensured that the SECU is completely levelled to ensure door mechanisms are working properly and doors can be operated safely. The supplier needs to safeguard that after releasing the SECU, the doors and bars are in proper working condition and fully closed and locked. Any deviations and/or damage to SECUs must be reported to Stora Enso Liner Systems immediately. More detailed instructions are provided in the separate document "SECU handling and damage prevention" as well as the "Opening & closing instructions for SECU doors".

8.1.2. **Inspection, loading and cargo securing**

8.1.2.1 Inspection

The condition of the roll trailers/cassettes/SECUs must be checked by the loader before operations starts. The floor must be clean, dry (no ice, water or oil stains), free of protruding and foreign objects, even and without holes. The lashing points must be in good condition and the feet and tires inspected for damage.

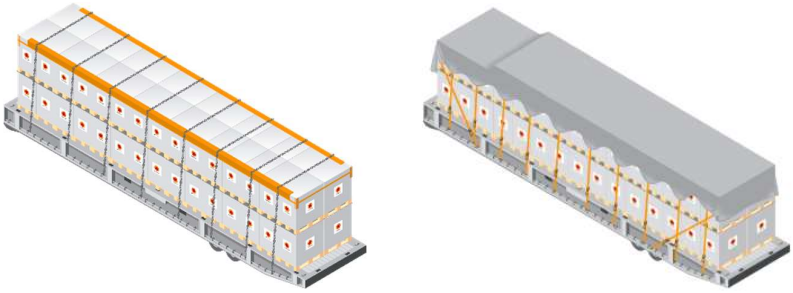
8.1.2.2 Loading

The payload and loading surface of the roll trailer/cassette/SECU is not to be exceeded. The height of the vessel's hold and entrance needs to be taken into account when stowing reels or pallets on roll-trailers/cassettes. To maintain stability, the cargo height may not exceed 3.5m.

If different types of units are loaded on the roll trailer/cassette, the lighter units must always be loaded on top of heavier ones. Stowage must always be as tight as possible. When loading pallets in more than one layer, plywood boards must be used between layers to prevent damage and to stabilize the load. The load must be built as evenly as possible.
In order to avoid damage, the cargo and securing materials may not overlap the roll trailer/cassette's sides. Depending on the reels' diameters and in order to maximize the payload, either a nested or soldier stow is used. Units positioned closely to the SECU doors need to have anti-slip material underneath them. This in order to avoid movement, damages and safety-incidents when opening the SECU.

8.1.2.3 Cargo securing

Cargo securing can be done in one of several ways, depending on the type of transport unit. For cassettes and roll trailers, regular lashing with edge protection can be used. Alternatively, using a tarpaulin system (e.g. FIX Marine) will also protect the cargo to some extent from rain, snow, sun, etc.



Lashing with edge protector and tarpaulin

Pallets in SECUs must be secured with frames, lashing belt, airbags and corner profiles

On board the vessel, RoRo units must be secured firmly to the deck in order to withstand all vessel movements during the voyage. Cassettes and SECUs can be secured either in lanes or by block stowage.

8.2 StoRo (Stowable RoRo)

With this loading method, cargo is brought alongside (in case of side ports) or in the vessel (in case of stern ramp) by forklift trucks, cassettes or roll trailers. Units are then stowed by forklifts directly in the ship's holds. This method increases the carrying capacity of the vessel as tighter and higher stowage can be performed.

8.2.1. **Condition of holds and decks**

The cargo holds must be clean, dry, even and without odour. The walls also need to be checked in order to prevent damage of protruding objects.

In case there are unevenness in pontoon joints or tank top, plywood or soft board is to be used. During the winter period, use of protective paper under reels should be used.

Protective materials on deck

8.2.2. **Loading**

A nested pattern is to be formed when storing reels in the holds, leaving no space in between. A tight stow is necessary to avoid any movement of the cargo during the sea voyage.

The loading of each new row must be done from the opposite direction than the previous row, as this ensures a tight stow. Overlapping is to be avoided and smaller diameter reels must be placed underneath reels with slightly larger diameters. In case of diameter differences, the front line must be kept as even as possible. Reels with large differences in diameter (more than 200mm) may not be stacked on top of one another.

Keeping an even front line

8.2.3. **Securing of the cargo**

The cargo must be secured so shifting is eliminated.

There are many ways of securing the last tier. Tarpaulins can be used for lashing the cargo and it must then be installed at the top of the cargo hold with the end secured to the deck. Every layer of cargo at the end tier can also be lashed with horizontal lashing belts.

Step-down securing must be used whenever possible. In this method the final tier is secured with belts and edge 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 cargo that locks the previous tiers.

Cargo securing in StoRo vessel

8.3 LoLo (Lift on Lift Off)

LoLo vessels transport a wide range of products as a result of their flexible cargo space. Cargo is loaded and discharged over the top of the vessel either by the ships crane or shore crane. Although more time consuming and subjected to weather conditions, different sizes are available on the market and can be optimized according to the volumes to be shipped.

As Stora Enso cargo is weather-sensitive, operations in the event of (light) rain/snow may proceed only when a Rain Letter / Letter of Indemnity (LOI) has been issued by Stora Enso.

8.3.1. **Condition of the cargo hold**

The cargo hold should preferably be box shaped. All irregularities in hold structure increase the risk of cargo damage. Tank top and bulkheads must be clean, even, fully painted and rust free. Protective paper, plywood, timber dunnage or soft board must be used to protect the cargo when needed. Cargo spaces and hatch covers must be completely watertight with gaskets and drainage systems fully operational. Stora Enso has the right to refuse to load if hold condition is not meeting the requirements. Any demurrage cost related to vessel readiness will not be accepted.

For spot coaster shipments, the *Vessel Checklist* (Appendix 5 or at https://www.storaenso.com/en/suppliers/logistics-services/logistics-supplier-information) must be filled in by the supplier, signed by the master and forwarded to sea.logistics@storaenso.com.

Joint vessel inspections will be arranged for other liner vessels at agreed intervals. Non-conformance must always be reported.


Vessel checklist

8.3.2. **Loading and securing**

8.3.2.1 Reels

Ship movements can be rough during a sea voyage. A nested loading pattern is to be kept, leaving no space in between the reels.

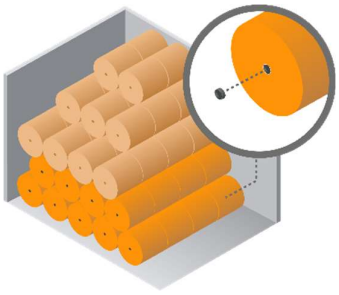
Airbags must be used on the top layer for stabilizing and securing the stowage.


Nested reels in the hold

If laying stowage has been agreed, reels must be pre-slung with reusable or one-way polyester belts. A minimum of three layers must always be loaded in order to lock the stowage properly and to prevent reels from rolling during transport. A maximum of 3 layers is allowed if reels are unplugged.

For every extra layer, plugged reels must be placed at the bottom. The overall maximum number of layers is restricted to five.

Reels laying in the hold

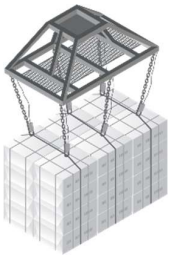


Plugged reels at the bottom

8.3.2.2 Pulp

Steel platforms or trailers must be used on the quay. Placing units directly on the ground is not allowed due to the risk of contamination. The condition of lifting wires must be checked before loading. All lifting wires have to be intact and lifting is not allowed when wires are missing or broken. Lifting of units must be done only using the double hook method and with a proper frame/spreader. Same requirements are also valid during discharging.

Separate orders of pulp must be marked with ink-based marker spray or ropes when stowed in the hold(s), so that orders are visually separated and incorrect deliveries avoided.



Double hook method

Loading must be done in such a way that cargo movement during sea voyage is prevented. This can be achieved by ensuring a proper and tight stowage pattern and with the use of airbags on the top layer. Pulp bales are not allowed to be loaded in lying position.

Use of protective paper under the units is mandatory year-round. Use of wooden dunnage material with pulp is not allowed due to the risk of contamination. If loading of wood products and other cargo into the same hold is required, pulp has to be separated and covered with tarpaulins.

Stowage of pulp

8.3.2.3 Timber

Lifting is to be done safely with endless fiber ropes or polyester belts according to EN 1492-4:2004+A1:2008. The use of chains is forbidden. Lifting equipment must be inspected prior to loading operations by a qualified person to evaluate and validate safe condition.

Due to the risk of water damage but also to ensure the safety of staff, the timber packages must be inspected for water and ice. Any water, ice or snow must be removed before loading. For deck cargo, weather protection must be considered, preferably by using tarpaulins.

In case packages are stowed in the hold with a forklift truck and working on top of the cargo is required, packages must be covered by steel plates.

Timber packages are not allowed to be stowed on their sides.

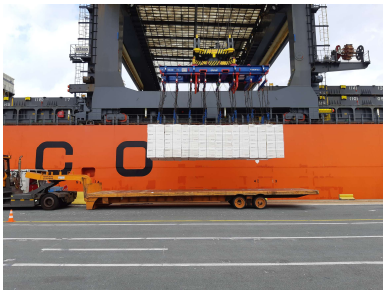
8.3.3. **Handling equipment for LoLo**

LoLo loading of reels can be performed using either a head clamp with rubber pads or by the use of a protected cage and clamp truck inside the vessel hold. Both require a crane, from which the operator can see into the hold of the vessel.




Handling equipment for LoLo

LoLo loading of pulp is performed by using spreaders, which are suspended from either a shore-based crane or the vessels (gantry)crane




Equipment used for loading and unloading of pulp bales

9. DAMAGE HANDLING

After leaving the production site at Stora Enso, any change in the condition of a cargo and/or its packaging that requires remedial action is recorded as damage.

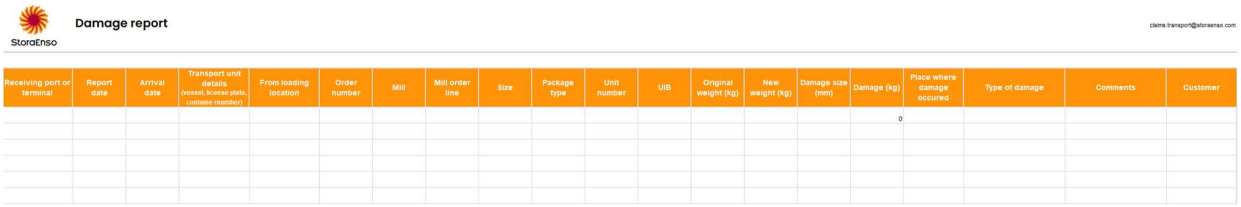
The supplier is obligated to immediately remove damaged units from prime stock and store them in a clearly marked quarantine area for further inspection and actions. Uninspected cargo is not permitted to be shipped. In general, Stora Enso is applying a zero-defect policy.

Quarantine-area

9.1 Inspection and reconditioning of cargo

The supplier and consignee/customer must always visually check the condition of the cargo units when handling them. If there is damage, digital photos are to be taken whilst the cargo is still on the vehicle, on-board the vessel or carrying-equipment such as trailer, SECU, container or wagon, i.e. before the cargo is handled or unloaded. A remark needs to be made on the transport documents. Any discrepancies in the number of units received, compared to the waybill, must be reported to Stora Enso.

When inspecting damaged cargo, information must be recorded in a *Damage report* (see Appendix 6). In the report, the supplier must provide all relevant information about the place where the damage occurred, the damage type and the cause.



Damage report

claims.transport@storaenso.com

Receiving port or terminal	Report date	Arrival date	Transport unit details (vessel, license plate, container number)	From loading location	Order number	Mill	Mill order line	Size	Package type	Unit number	UIB	Original weight (kg)	New weight (kg)	Damage size (mm)	Damage (kg)	Place where damage occured	Type of damage	Comments	Customer
															0				

The damage report, transport document and digital photos are to be sent to Stora Enso:

- Businesses areas: Cartonboard, Food Service & Liquid Board and Containerboard: claims.transport@storaenso.com
- Business area Biomaterials: pulpclaims.transport@storaenso.com
- Other business areas: please contact your local Stora Enso representative

Suppliers must also report damage via electronic reporting systems as soon as the damage is observed.

Based on the inspection, the supplier must recondition or reject the unit according to the instructions below. The unit status must be updated accordingly in all relevant systems.

If reconditioning is necessary, persons operating within the area must comply with the hygiene requirements outlined in section 2.3 of this manual. Reconditioning involves taking one or more of the following actions:

- Taping.
- Replacing endcaps.
- Repacking
- Stripping of damaged part and repacking.
- Cleaning of units.
- Repairing a damaged pallet base.

Before repacking, the supplier must ensure the quality of the cargo and verify that:

- There is no dirt, dust, particles etc. inside the package.
- Packaging material is clean and suitable.
- The tightness of wrapping on repacked products is sufficient.
- Strict hygiene requirements are respected.

After the above steps are completed, the label on the unit, the stock sheets and other applicable stock control systems as well as the *'Damage Report'* must be checked and updated to ensure traceability. Units that are beyond repair are rejected and should preferably be identified with a sticker.

9.2 Classification of damage

Where	What	How
Place of damage – mandatory		
At place of inspection		
Before place of inspection		
Notice point of damage – mandatory	**Type of damage – mandatory**	**Cause of damage – if clearly identified**
00 Mill	01 Edge damage	Handling
01 Pre transport	02 Side damage	Transportation
02 Port of loading (storage & handling)	03 End damage	Warehousing
03 Port of loading (stowage & unitising)	04 Wrapper damage/broken pallet base	Deficiencies handling equipment
04 In vessel	05 Core damage	Deficiencies transport facilities
05 Discharge port (discharge, storage)	06 Deformation / Out-of-roundness	Deficiencies warehouse
06 Discharge port (loading & delivery unitising)	07 Water damage	Insufficient packing
07 Terminal or Inland warehouse	08 Dirt and contamination	Insufficient lashing
08 Delivery port	09 Shortage, non-delivery	Condensation
09 Printer	00 Other, spoiling, mould, rust, etc	Other (only if no other classification applicable)

9.3 Criteria for handling damage by product area

9.3.1. **Reels**

Criteria for rejecting a reel:

- Oval or crushed core.
- Oil stained, wet reel or other contamination which has penetrated through wrapping.
- Odour.
- End, side or edge damage exceeding:
    - 10% of the reel's radius of consumer board products and paper grades[2]
    - 70 mm of reel radius of containerboard products (fluting, kraftliner and linerboard).[3]

Criteria for refurbishing a reel:

- Paper grades and consumer board reels: If the damage is less extensive than stated above.
- Containerboard reels: All damage up to the rejection limit shall be taped and reported as repaired. Unless otherwise agreed and instructed.
- Raw material for sheeters or convertors: Damage is to be reported, shall be taped (not refurbished!) and reported as repaired. After reporting, RF status can be given.
- Wrapper damage:
    - If damage to the wrapper is less than that of two hands, it shall be taped.
    - If damage to the wrapper is greater than two hands, the reel must be repacked.
    - Taping is not allowed if there is any damage to the cargo itself.
    - Tape used must have the identification of the contracted supplier.

Multipack reels (multiple reels in same package):

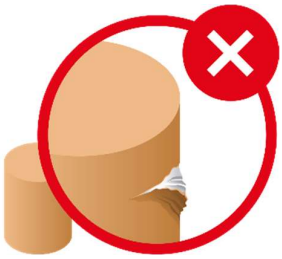
- If one of the reels inside the package is to be refurbished, remove the same amount of layers from both units and repack.
- If one of the reels inside of package is to be rejected, remove the rejected reel and the others must be repacked and placed in stock for onward delivery.

[2] Mill Business Units: AN, F2, F3, IB, K1, K2, K4, LM, LN, OB, S7, S8 & TA

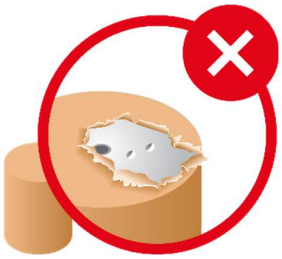
[3] Mill Business Units: FL, O1, O3, O5, OC, WA

Damage types reels:

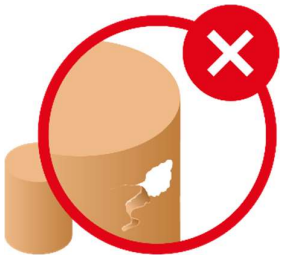
01 Edge damage



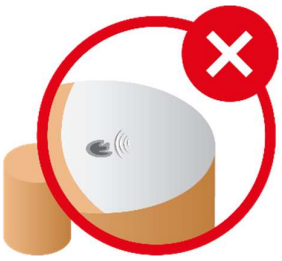
02 Side damage



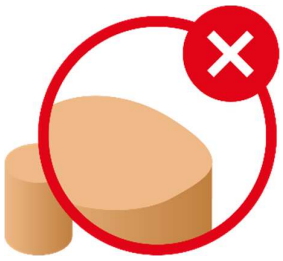
03 End damage



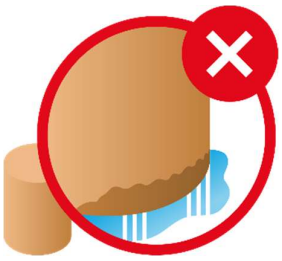
04 Wrapper damage



05 Core damage



06 Deformation / OOR



07 Water damage

08 Dirt or contamination

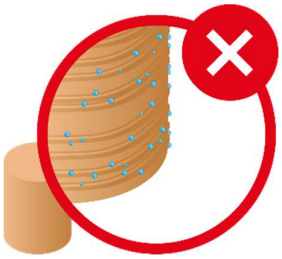
09 Shortage / non-delivery

00 Other

9.3.3.1 Condensation

Condensation on cargo occurs frequently in winter, when cargo is stored and loaded in a cold climate and then transported to countries with a warmer and more humid environment. This phenomenon can also occur during storage when the temperature suddenly rises to plus degrees after a longer period of cold weather.

If during a voyage the holds are ventilated with air of higher dew point than the temperature of the cargo, the vapour in the air condensates, which results in water drops on the cargo. Condensation continues until the surface of the cargo reaches the same temperature as the dew point in the air surrounding the cargo.



Unit subject to condensation

In sea transports, when shipping cargo from cold climates to milder ones, condensation damage can be avoided by:

- Closing air vents.
- Circulating air in the hold and warming it up when possible.
- Using dehumidifiers.

Reels affected by condensation or ice must be put in a horizontal position to facilitate the drying of the reel. In case the space in the warehouse does not permit this, the reels must be separated from each other and not stacked. Storage must be in a well-ventilated and heated environment, allowing the reels to dry. Stora Enso is to be informed immediately in case of severe condensation.

9.3.2. **Pallets**

General requirements:

- Pallet bases must be intact. If the pallet base is damaged, it must be repaired before shipping.
- All broken bands must be replaced.
- Bands must have their original tightness.
- If torn, wrapping must be taped immediately. Note that plastic is to be placed under the tape to safeguard the cargo. New plastic foil must be provided for larger exposed areas.
- Stacks must be straight.
- Any dirt or other contamination on the packaging must be cleaned.

Cupboard pallets, narrow reels on pallet:

- When damage occurs to individual reels with a radius of up to 50 mm, each reel must be individually reconditioned by removing the damaged layers. If more than half of the reels on a pallet are damaged to this extent, all of the reels on the pallet are to be stripped to a uniform diameter.
- Reels must be centred on the pallet and placed in an upright position.

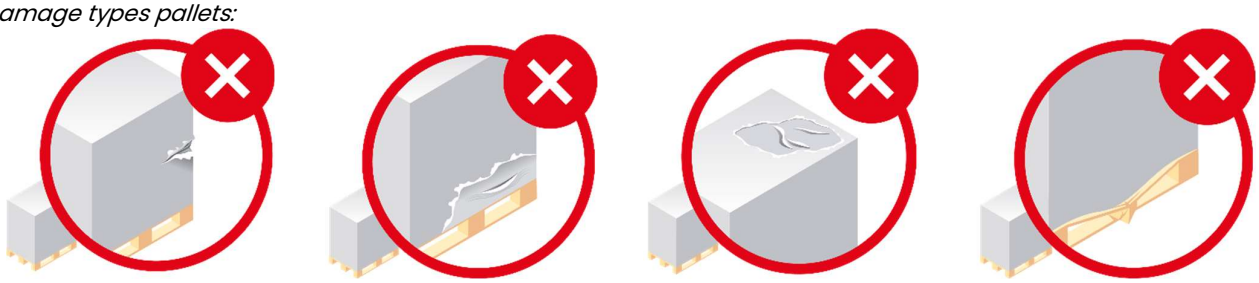
Loose sheets and ream wrapped sheets on pallets (bulk packed) – unless otherwise instructed:

- All cargo damage by forks is to be rejected.
- Shifted sheets or moved sheets from pallets are to be rejected (no restacking).
- Capsized pallets are always to be rejected.

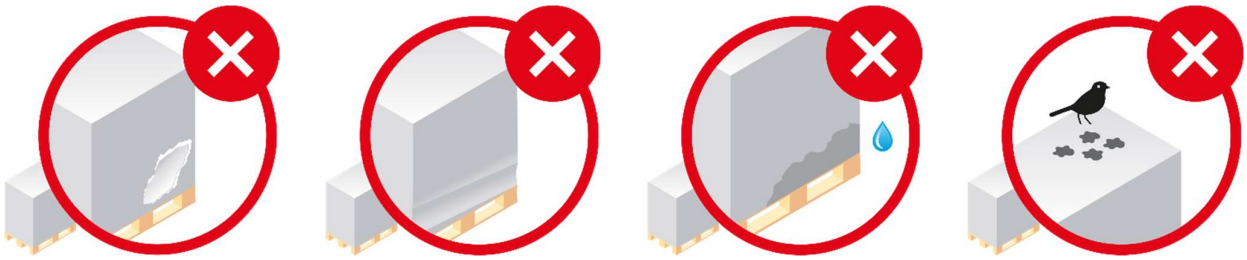
Pallets with corrugated sheets:

- For all damages, the mill is to be contacted and will provide instructions.

Damage types pallets:



01 Edge damage *02 Side damage* *03 End/top damage* *04 Broken base, lid or straps*



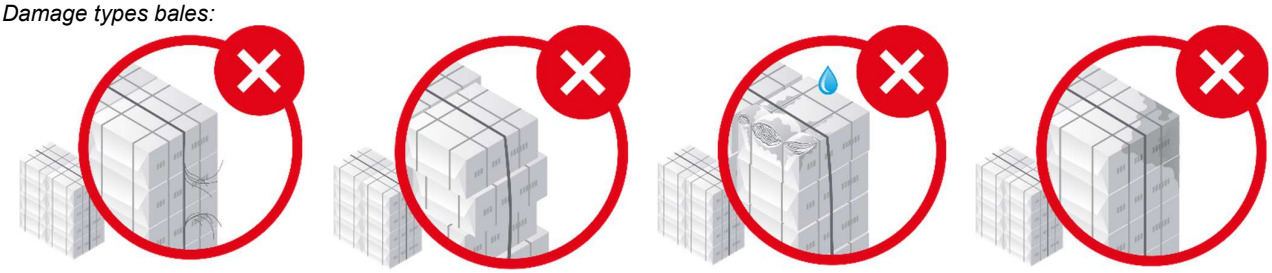
04 Wrapper damage *06 Deformation* *07 Water damage* *08 Dirt and contamination*

09 Shortage / non-delivery *00 Other*

9.3.3. **Pulp**

Pulp is delivered for various end users, including the hygiene industry where damage tolerance is very low. Wrapper and wire damage as well as contaminated pulp or units containing foreign particles can cause serious safety risks and failures in customer's production processes.

Damage types bales:



04 Broken lifting wires *06 Deformation or loose* *07 Water damage* *08 Dirt and contamination*

Detailed instructions are described in "Fluff Manual", "Bale Manual" and "Photo Documentation Instruction". The documents are available on request from Biomaterials Logistics Team.

9.4 Damages and incidents during transportation

In the event of an accident, damage or loss, the supplier must immediately report any transport damage and loss of cargo to Stora Enso. A written report containing the following information must be provided immediately:

- Registration number and type of vehicles involved or sea transport details: vessel name, arrival dates
- Place, time and details of the accident or event resulting in damage or loss.
- Names and address of casualties.
- Extent of cargo loss.
- Consignment details.
- Measures taken by the supplier.
- Contact details, names and telephone numbers of the supplier.

Should the freight have any transport damage, the supplier must notify Stora Enso immediately and ask for instructions. Using the contact detailed provided under chapter 9.1

Moreover, the supplier is obliged to notify Stora Enso of any complaints made by the consignee concerning the quality and quantity of the goods as well as the service claims i.e. late delivery and to have the consignee to note any complaints on the POD (Proof of Delivery).

9.5 Claims for goods received with transport damage

When receiving goods, the receiver (the customer / supplier) is asked to follow the steps below. Note that in many cases Stora Enso will make a direct claim with the supplier.

Steps to be taken and documents required to support claims for transport-damaged cargo:

- When receiving cargo, check the external condition of the cargo and make a remark of any deviation in the delivery note (POD/CMR/CIM/Lieferschein).
- Stora Enso must be notified immediately of visible or apparent damage. Invisible damage must be reported to Stora Enso as soon as possible, but no later than seven days after delivery.
- The driver of the vehicle or delivering party must countersign any remarks.
- Customers are to notify Stora Enso or the Settling Agent of the Insurance Company about the damage in writing and without delay. The notification must include all Stora Enso references (orders and unit numbers) and a description of the type of damage detected.
- On receipt of notification, Stora Enso (or the Settling Agent of the Insurance Company) will determine whether it is necessary to instruct a surveyor to inspect the nature, cause and extent of the alleged damage. The cargo must therefore be kept aside for survey purposes until Stora Enso informs otherwise.
- The cargo is to be stored with its original wrappings, end caps and identification markings.

The claimant shall provide the office of Stora Enso the following documents to support the claim:

- copy of the written notification;
- copy of the commercial invoice covering the goods claimed, if applicable;
- copy of the weight specification / packing list;
- copy of the transport document (e.g. CIM, haulage note, B/L, AWB, CMR);
- Any photographic material showing the damage, preferably on/in the original transport unit.

Note that Stora Enso (or the subrogated Insurance Company) will attempt to recover the damage from the party likely to have caused it.

All parties that handle the goods have a duty to prevent any damages. Should damage occur, every effort must be taken to ensure that the damage does not increase. The costs incurred to avoid or limit the increase of damage can be included in the insurance/recovery claim. If you need any further information, contact nearest Stora Enso office, contact detailed provided under chapter 9.1.

10. AEO

Valid for cargo and services or part of a service within a supply chain with a destination to or from a country outside the European Union.

Background
Stora Enso applies the European Community Customs' AEO certification program to meet stipulated requirements for AEO certificates including Customs Simplifications / Safety and Security. An Authorized Economic Operator is an operator that is committed to assuring the common objective of supply chain security, and is therefore entitled to enjoy benefits throughout the Community.

An AEO certificate Customs Simplifications / Security and Safety is issued to any economic operator established in the Community that fulfils the criteria of customs compliance, appropriate record-keeping standards, financial solvency, proven practical standards of competence or professional qualifications, and maintains appropriate security and safety standards. Authorized Economic Operators can only be held responsible for their part in the supply chain, but they are also dependent on the security standards of their business partners to ensure the security of the cargo in their custody.

In order to meet AEO requirements, when entering into a new contractual arrangement with a business partner, the AEO certificate holder must encourage the new business party to assess and enhance its supply chain security and, to the extent practical from a business perspective, include such language in contractual arrangements. In addition, the AEO holder is recommended to retain documentation to support and demonstrate efforts to ensure that business partners meet these requirements.

More information about AEO requirements is provided by European Community Taxation and Customs:
https://taxation-customs.ec.europa.eu/customs/authorised-economic-operator/programme_en

Requirements for Suppliers
Suppliers must internally, and in relation to their sub-Suppliers, implement required safety procedures according to their role in the international supply chain. The Supplier must monitor, follow-up and take actions in order to comply with AEO requirements. Stora Enso has the right to follow up on the implementation of AEO requirements in the Supplier's organization and in relation to the Suppliers' sub-Suppliers.

The following requirements are applicable to all Suppliers that have access to cargo supplied to or by Stora Enso within the international supply chain and with a destination to or from a country outside the European Union.

No.	Item	Criteria
1	General knowledge about AEO	The Supplier has appropriate knowledge of the AEO program and the requirements of the program applicable to their responsibilities and role in the international supply chain

2	Cargo protection	Cargo, transport units and trade documents are secured against unauthorized access and any illegal activities during production, loading, unloading, storage and transport
3	Information protection	Document archives, computers and IT systems are secured and have appropriate access control measures against loss and tampering of information
4	Recruitment procedures	The identity of all new employees is checked and security screening is performed on prospective employees working in security sensitive positions
5	Employee procedures	Safety and security training is provided to employees on a regular basis to ensure that employees are aware of security risks related to the international supply chain
6	Contact person for safety and security	The Supplier has appointed a responsible person competent in safety and security related questions
7	Security guidelines	When working or accessing a Stora Enso's mill site, the Supplier's employees must comply with all security instructions provided by Stora Enso
8	Deviation reporting and follow up	The Supplier has procedures to immediately inform Stora Enso's contact person of any security risks or deviations in relation to cargo, trade documents and information
9	Information protection	The Supplier's employees are allowed to share information with a third party about Stora Enso's cargo or products purchased or delivered only to the extent this is necessary for the delivery. Information may only be shared with a third party related to the specific purchase or delivery. It is prohibited to share any other information.
10	Sub-contractor follow up	The Supplier has appropriate measures of identification and follow-up of their sub-contractors

Requirements for production and storage

The following requirements are applicable to all Suppliers that have access to Stora Enso cargo during production and/or storage.

No.	Item	Criteria
1	Facilities	Production, storage and warehouse facilities are built in a way that protects against unauthorized access
2	Access control measures	Appropriate security measures are implemented to prevent unauthorized access to production and storage areas. Such measures may include e.g. fences, security systems, access control etc.

3	Access rights control	Access rights, including keys and access cards, to production, storage and warehouse facilities, where cargo are manufactured, stored, loaded and unloaded, must be limited and monitored appropriately
4	Employee procedures	Personnel working in production and storage areas are provided with security instructions and given regular training on security matters
5	Recruitment procedures	The identity, background and work history of personnel working in production and storage areas are verified

Requirements for loading and unloading

The following requirements are applicable to all Suppliers that have access to cargo during loading and unloading.

No.	Item	Criteria
1	Facilities	Loading and unloading facilities are built in a way that protects against unauthorized access
2	Access control measures	Appropriate security measures are implemented to prevent unauthorized access to loading and unloading areas. Such measures may include e.g. fences, security systems, access control etc.
3	Access rights control	Access rights, including keys and access cards, to loading and unloading areas are limited and monitored appropriately
4	Employee procedures	Personnel working in loading and unloading have security instructions and are given regular training on security matters
5	Transport unit security	Transport units are inspected during loading and unloading to detect any illegal activities and unauthorized access. The inspection may be performed visually or using necessary tools. Any suspicious alterations in the structure of the transport unit must be reported to Stora Enso. The following parts of all transport units must be inspected: 1) front wall; 2) left side; 3) right side; 4) floor; 5) inside/outside ceiling; 6) inside/outside doors; 7) exterior/bottom.
6	Handling of seals	Bookkeeping of seals is maintained to ensure that seals are used appropriately

7	Handling of seals	Sealed transport units are inspected before unloading to verify that the seal is intact
8	Recruitment procedures	The identity, background and work history of personnel working in loading and unloading are verified

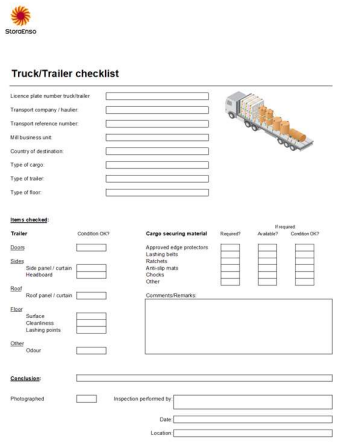
Requirements for transportation

The following requirements are applicable to all Suppliers that have access to cargo during transportation.

No.	Item	Criteria
1	Access control measures	Appropriate security measures are implemented to prevent unauthorized access to the cargo during transportation
2	Information security	Trade documents are secured during transportation
3	Employee procedures	Personnel working in transportation are provided security instructions and given regular training on security matters
4	Recruitment procedures	The identity, background and work history of personnel working in transportation are verified

Appendix 1: Truck/trailer checklist

Criteria for checking the condition of a truck/trailer:


Truck/Trailer checklist

Doors:

- Doors, gaskets and locks are to be in a proper working condition, 100% watertight and allowing the cargo space to be completely closed off.

Walls & roof:

- The walls and roof of the transport unit must be in good and sound condition, 100% watertight, even and free from any protruding objects.
- The trailer's headboard must be smooth and even.
- For curtain side trailers, the opening and closing function of the tarpaulin must be in proper working condition and with no damage in the tarpaulin.

Floor:

- The floor must be completely dry, watertight, clean and smooth (no nails, stains, bolts, dust, remains of previous cargo, wood chips, other protruding objects, etc.)
- Broken, cracked, missing or non-functional lashing rings are not accepted.

Odour:

The truck/trailer must be without any odour. Occasionally previous cargo can leave strong odour inside the truck/trailer, which can easily adhere to and harm the cargo, e.g. tea, rubber, perfumes, leather, spices, fish and chemicals.

Infestation/pest control:

The container must be free from any animals or infestations, dead or alive.

Cargo securing materials:

Stora Enso approved lashing and securing materials are to be used to secure the cargo. Please see Stora Enso Cargo Handling and Securing Manual for details.

Appendix 2: List of Approved Edge Protectors for reels

(Updated Feb 01, 2026)

The below listed edge protectors are approved by Stora Enso (and independent testing and certification organisations) and are to be used when transporting Stora Enso reels. This list contains all edge protectors currently allowed for the securing of reels. Stora Enso reserves the right to add or remove edge protectors from this list.

BEFORM A/S

Product name:
Beform Edge Protector HD™
Art. No.: 8002226

Contact details:
BEFORM NORGE AS
Flyplassveien 32,
N-3514
Hønefoss

+47 (0)23 38 47 73

orders@beform.no
www.beform.no

Certification:
Pb. Nr. 226/1605/702073/181-6350824






Weight: ± 370 gr
Colour: Unspecified

K-factor: ≥ 1,8
Material: PP/HDPE

Patent number: /

BEFORM A/S

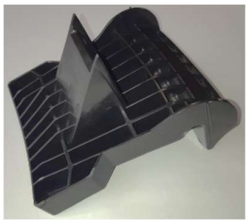
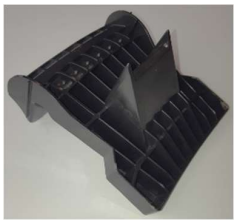
Product name:
Beform Edge Protector SR™
Art. No.: 8003200

Contact details:
BEFORM
NORGE AS
Flyplassveien 32,
N-3514
Hønefoss

+47 (0)23 38 47 73

orders@beform.no
www.beform.no

Certification:
226/35527/703550/1822889241


Weight: ± 325 gr
Colour: Unspecified

K-factor: ≥ 1,8
Material: PP/PE-HD

Patent number: /

A-PLAST AB

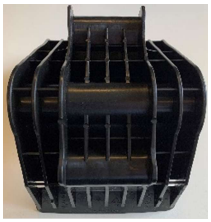
Product name:
Corner Protector MAX

Contact details:
A-Plast AB
Högsbyvägen 16,
SE-364 95 Älghult

+ 46 (0)481 639 50

info@a-plast.se
www.a-plast.com

Certification:
226/35527/703550/1824929733






Weight: ± 320 gr
Colour: Black

K-factor: 1,8
Material: HDPE

Patent number: /

SPEDITION BODE
Transport und Logistik

Product name:
BoKas

Contact details:
Spedition Bode
Feldstrasse 2
23858 Reinfeld (Holstein)

+494533 70 600

info@spedition-bode.de
https://www.spedition-bode.de/

Certification:
DBGM






Weight: ± 1920 gr
Colour: Metallic

K-factor: 1,7
Material: Aluminium

Patent number: /

TRANSPORT TECHNIK GÜNTHER

Product name:
Kantenschützer Art. 1015

Contact details:
Transport-Technik Günther GmbH & Co. KG
Derchinger Str. 125,
D-86165 Augsburg

+ 49 (0)821 543 788 40

info@transport-technik.de
www.transport-technik.de

Certification:
Kantenschutz Papier Spezial






Weight: ± 285 gr
Colour: Green

K-factor: 1,8
Material: PP

Patent number: 199 04 843

TRANSPORT TECHNIK GÜNTHER

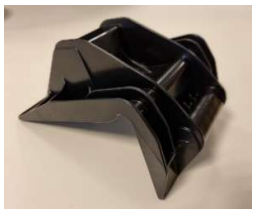
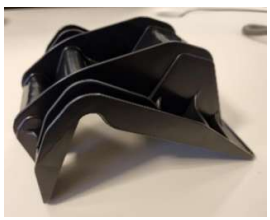
Product name:
Kantenschützer Art. 1016

Contact details:
Transport-Technik Günther GmbH & Co. KG
Derchinger Str. 125,
D-86165 Augsburg

+ 49 (0)821 543 788 40

info@transport-technik.de
www.transport-technik.de

Certification:
Kantenschutz Papier Spezial Modifikation


Weight: ± 225 gr
Colour: Black

K-factor: 1,8
Material: PP

Patent number: 199 04 843

VELTKAMP B.V.

Product name:
CPP60

Contact details:
Veltkamp B.V.
Witte Paal 28-30
1742 NL Schagen

+31 224 274010

info@veltkamp.pro
www.veltkamp.pro

Certification:
313/40793/703550/1820141635






Weight: ± 255 gr
Colour: Black

K-factor: 1,9
Material: PP/PE

Patent number:
6.045770

SPANSET GMBH

Product name:
KaSi Plus

Contact details:
SpanSet GmbH & Co. KG
Jülicher Straße 49-51
D-52531 Übach-Palenberg

+49 (0)2451 4831 0

info@spanset.de
www.spanset.de

Certification:
TRA-VSZ 2018-02-001/LS






Weight: ± 280 gr
Colour: Black

K-factor: > 1,7
Material: PP

Patent number: /

Plastex Sp.J

Product name:
KP Paper

Contact details:
Plastex Sp. J
Jawornik 738,
PL-32-400 Myślenice

+48 12 271 63 08

biuro@plastex.com.pl
www.plastex.com.pl

Certification:
/



Weight: ± 280 gr
Colour: Black

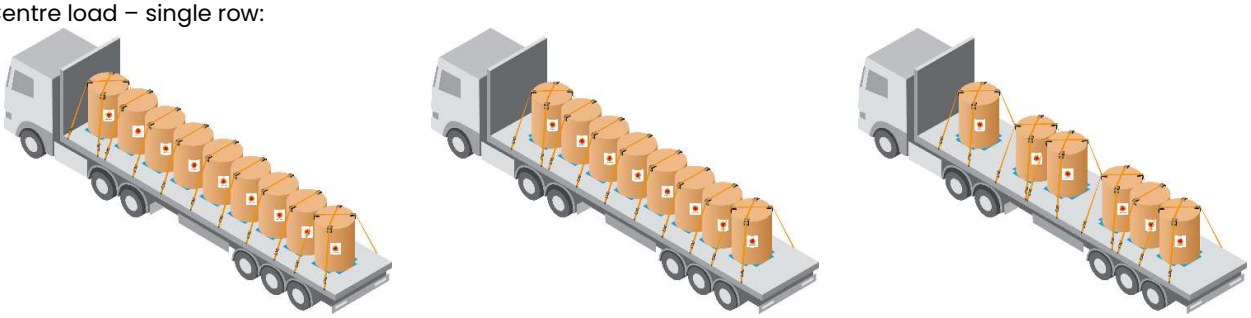
K-factor: > 1,8
Material: X

Patent number: /

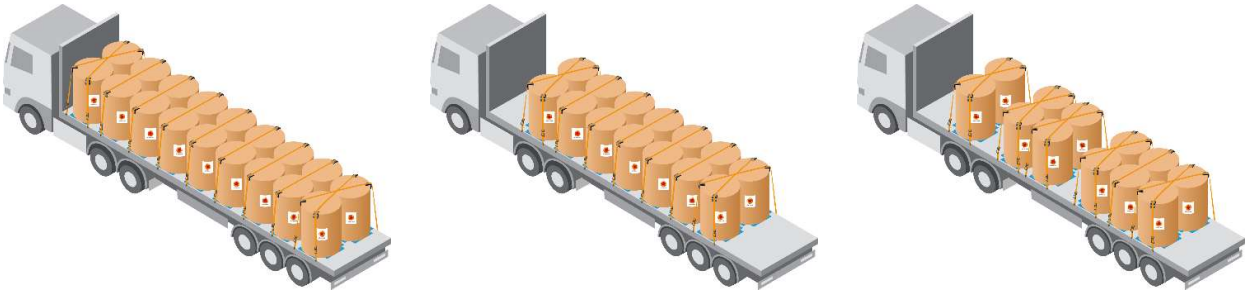
Appendix 3: Fact sheets

Fact sheet on proper load securing of paper reels:

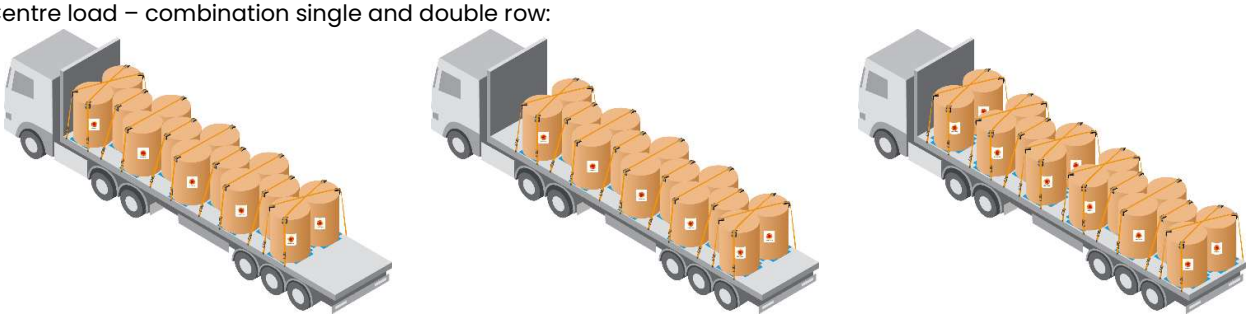
Centre load – single row:



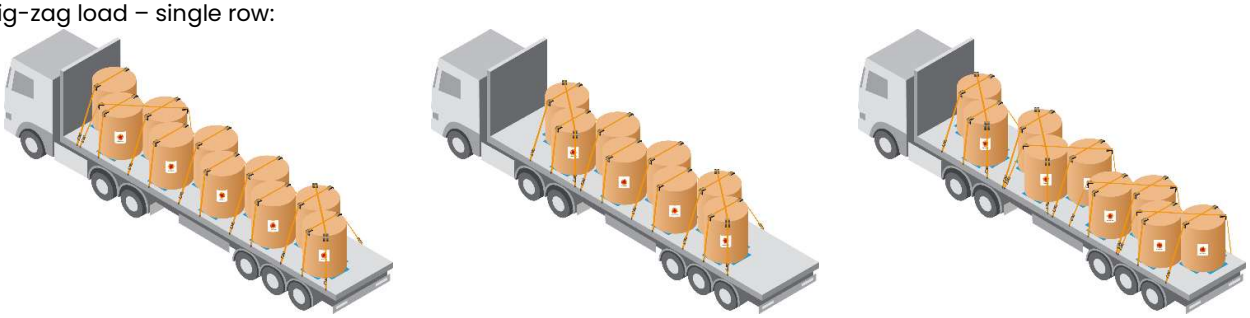
Centre load – double row:



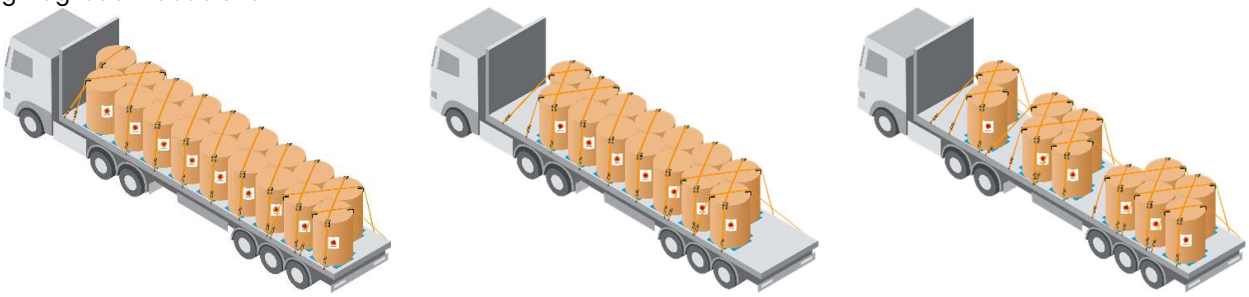
Centre load – combination single and double row:



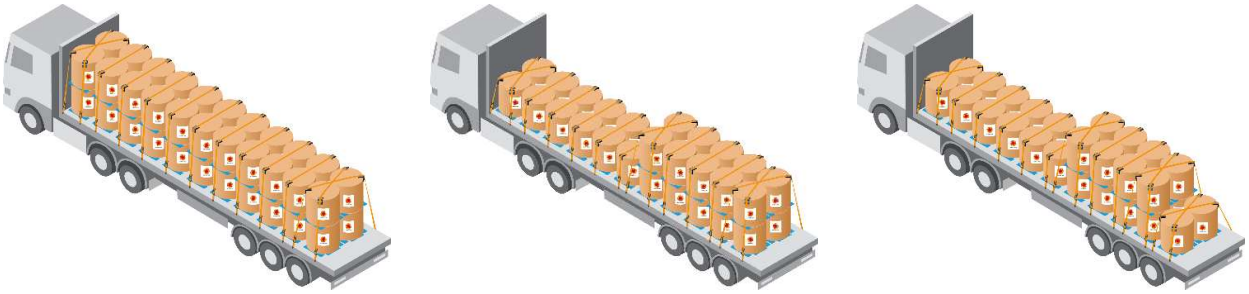
Zig-zag load – single row:



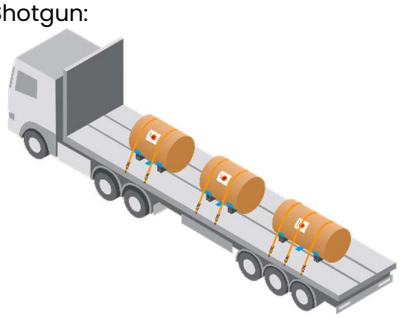
Zig-zag load – double row:

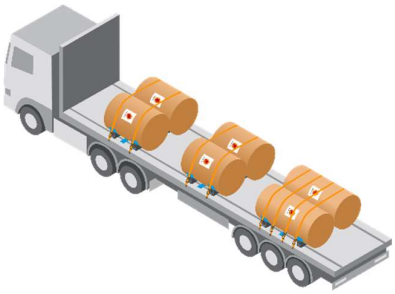


Stacked units:



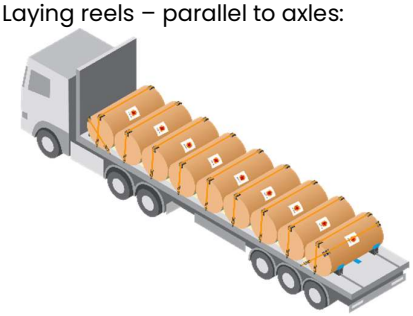
Shotgun:

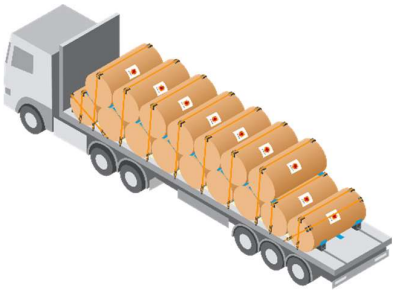




Total (combined) weight	Number of ratchets and lashing belts
≤ 5,000 kg	3
≤ 7,500 kg	4
≤ 10,000 kg	5
> 10,000 kg	6

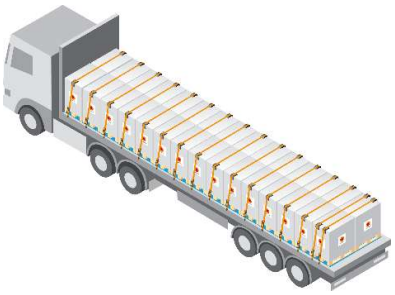
Laying reels – parallel to axles:

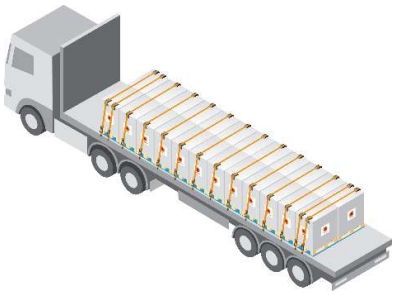


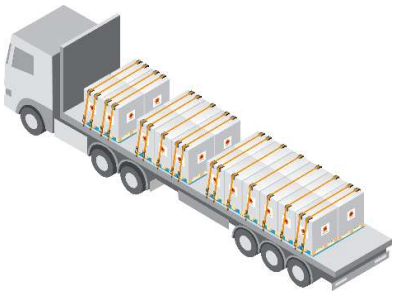


Fact sheet on proper load securing of paper pallets:

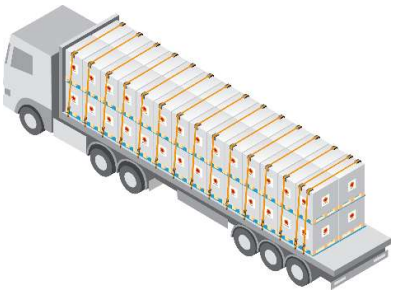
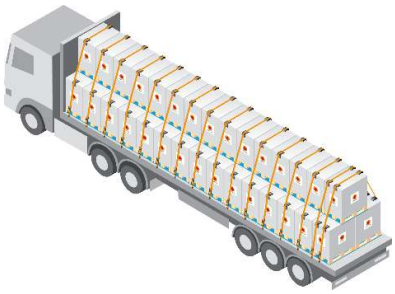
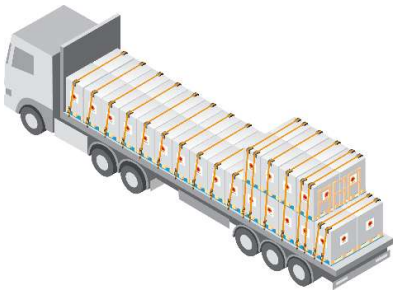
Centre load:



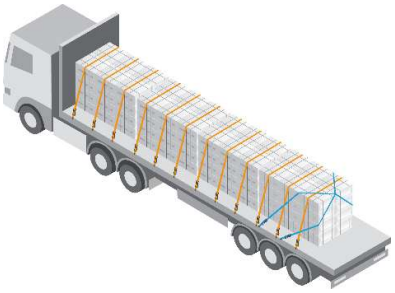
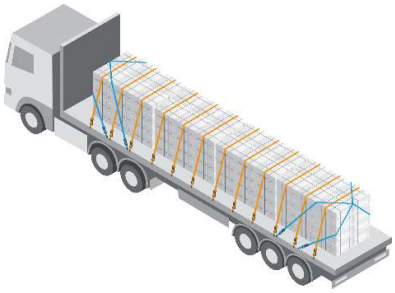




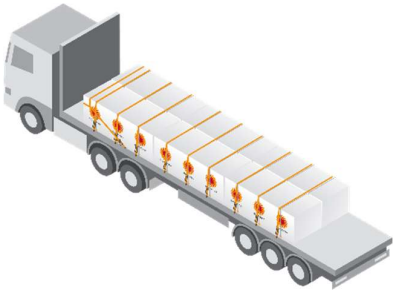
Stacked units:

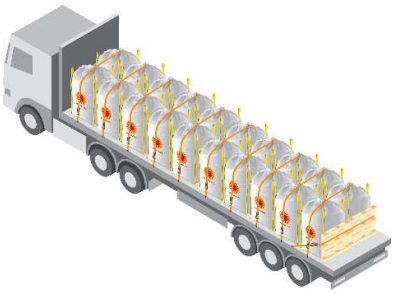
Fact sheet on proper load securing of pulp bales:

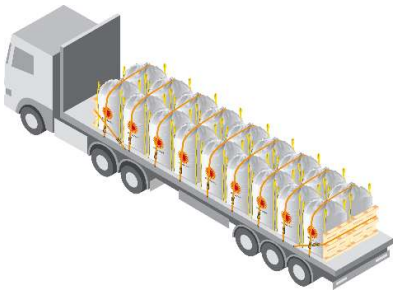



Fact sheet on proper load securing of timber packages:

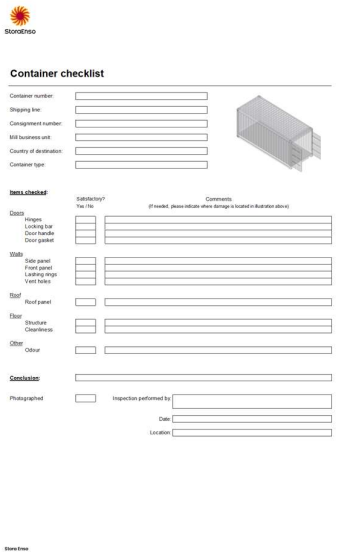
Fact sheet on proper load securing of big bags:





Appendix 4: Container checklist

Criteria for checking the condition of a container: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Container checklist

Container number:
Shipping line:
Consignment number:
Mill business unit:
Country of destination:
Container type:

Items checked: Satisfactory? Yes / No | Comments (If needed, please indicate where damage is located in illustration above)

Doors
Hinges
Locking bar
Door handle
Door gasket

Walls
Side panel
Front panel
Lashing rings
Vent holes

Roof
Roof panel

Floor
Structure
Cleanliness

Other
Odour

Conclusion:

Photographed | Inspection performed by:
Date:
Location:

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The following is not accepted:

Doors:

- Holed, cut, torn, broken, cracked component and/or weld or deformation affecting security and operation of door.
- Missing / broken or loose parts, which affect door operation or water tightness.

Walls:

- Dents into cube, which reduce the internal width by more than 50mm from the inner corrugation including multiple dents.
- Broken, cracked, missing or non-functional lashing rings.
- Vent holes blocked, loose, missing or damaged and not weather tight.

Roof:

- Dents into cube which reduce the internal height by more than 70mm from the floor to the roof inner corrugation including multiple dents

Floor:

- Gouge greater than 15 mm deep irrespective of length.
- Gouge more than 6mm deep and greater than 150mm wide irrespective of length.
- Delamination or other damage.
- Difference in height between adjacent planks/panels greater than 5mm.
- Holes other than nail holes.
- Three or more adjacent protruding fasteners broken, lose or missing.
- Glue (or other sticky products), infestation, insects, debris, cargo residues or other contamination that can be transferred.

Odour:

The container must be without any odour. Occasionally previous cargo can leave strong odour inside container, which can easily adhere to and harm the cargo, e.g. tea, rubber, perfumes, leather, spices, fish and chemicals.

Infestation/pest control:

The container must be free from any animals or infestations, dead or alive.

Appendix 5: Vessel checklist

Criteria for checking the condition of a vessel:

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Vessel checklist

Name of vessel:		Built year:	
Port of loading:		Previous cargo:	
Loading commenced:	Date/time	Loading completed:	Date/time
Weather during loading:		Tonnage loaded:	

Condition of hold items checked:

Cleaning	☐ Washed	☐ Swept	☐ Other	Comment
Sides	☐ Satisfactory	☐ Not satisfactory		Comment
Tank top	☐ Satisfactory	☐ Not satisfactory		Comment
Hatch covers	☐ Satisfactory	☐ Not satisfactory		Comment

Cargo plan provided by: ☐ Stevedore ☐ Captain

Protection material used: ☐ Dunnage ☐ Kraft paper ☐ Other ☐ None

Damage report provided by vessel: ☐ Yes ☐ No

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Cleaning:

- Indicate the method of cleaning

Walls:

- No physical properties that can endanger the cargo. Free from rust, loose paint or previous cargo residues.

Tank top:

- Even and dry surface.

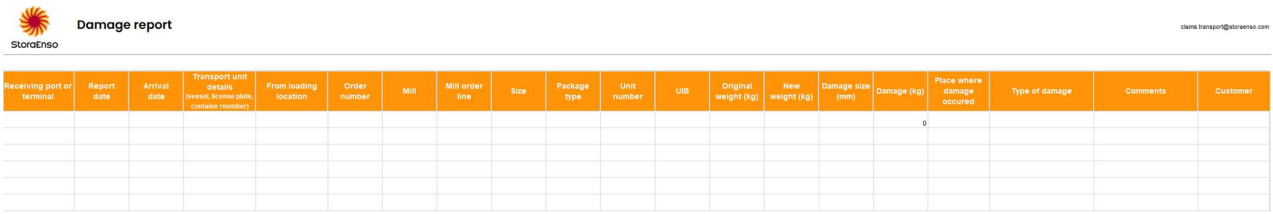
Hatch covers:

- Hatches closing properly to keep out snow, water or ice at all circumstances. Gaskets and drains clean and in good condition.

General remarks:

- Any circumstances affecting loading, e.g. cargo readiness, over-stowage, hold shape, inability to utilize full load capacity, etc.

Appendix 6: Damage report



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Damage report

claims.transport@storaenso.com

Receiving port or terminal	Report date	Arrival date	Transport unit details (vessel, license plate, containe rnumber)	From loading location	Order number	Mill	Mill order line	Size	Package type	Unit number	UIB	Original weight (kg)	New weight (kg)	Damage size (mm)	Damage (kg)	Place where damage occured	Type of damage	Comments	Customer
															0				

Link to document: https://www.storaenso.com/-/media/Documents/Download-center/Documents/Suppliers/Stora-Enso---transport-damage-report.xlsx

Appendix 7: List of abbreviations in alphabetic order

AEO - Authorised Economic Operator
AMC - Authorized Maintenance Company
CF - Clamping force
CIM - Convention Internationale concernant le transport des Marchandises par chemin de fer
CLT - Cross Laminated Timber
CMR - Convention relative au contrat de transport international de Marchandises par Route
CTU - Code of Practice for Packing of Cargo Transport Units
daN - dekaNewton
DIN - Deutsches Institut für Normung e. V.
EN - European Standard
FSC - Forest Stewardship Council
HACCP - Hazard Analysis, Critical Control Points
ICS - International Chamber of Shipping
ILO - International Labor Organization
IMO - International Maritime Organization
ISO - International Organization for Standardisation
ISPM - International Standards For Phytosanitary Measures
ISPS - International Ship and Port Facility Security (Code)
LC - Lashing Capacity
LoLo - Lift on Lift off
LVL - Laminated Veneer Lumber
LWC - Light Weight Coated
MSC - Maritime Safety Committee
OOR - Out Of Round
PEFC - Programme for the Endorsement of Forest Certification
POD - Proof Of Delivery
PPE - Personal Protection Equipment
PST - Physical Stock Taking
RoRo - Roll on Roll off
SC - Super Calandered
SECU - Stora Enso Cargo Unit
STF - Standard Tension Force
StoRo - Stowable RoRo
UIC - Unit Identification Code
UNECE - United Nations Economic Commission for Europe
URIRC - Unified Container Inspection & Repair Criteria

Appendix 8: Legislation and links

AEO for supply chain safety and security – Authorised Economic Operator
CTU Code - IMO/ILO/UNECE Code of Practice for Packing of Cargo Transport Units
DIN EN 283 – Basic testing requirements for swap bodies
DIN EN 12640 - Lashing points of commercial vehicles to forward goods
Directive 2022/2561 on the initial qualification and periodic training of drivers
(EC) No 2023/2006 on good manufacturing practice for materials and articles intended to come into contact with food
EN 12195-1:2010 - Load restraining on road vehicles - Safety - Part 1: Calculation of securing forces
EN 12195-2 - Lashing - Safety - Part 2: Lashing straps
FMCSA 49 CFR § 393.122 securement requirements for paper rolls (US cargo securing)
FMSCA 49 CFR § 393.102 & § 393.106 minimum performance criteria for cargo securement & general requirements for securing (US cargo securing)
FSC® - Forest Stewardship Council
HACCP - Hazard Analysis, Critical Control Points
IMO regulations and guidelines
ISO 1496-1:2013 - Series 1 freight containers - Specification and testing - Part 1: General cargo containers for general purposes
ISO 17712 - Freight containers — Mechanical seals
ISO 22000:2018 - Food safety management systems — Requirements for any organization in the food chain
ISPM 15 - International Standards for Phytosanitary Measures, No. 15
ISPS Code - The International Ship and Port Facility Security Code
MSC circular (MSC.1/Circ.1497)
PEFC - Program for the Endorsement of Certification Schemes
UCIRC (Unified Container Inspection and Repair Criteria
VDI 2700 - Securing of loads on road vehicles

https://taxation-customs.ec.europa.eu/customs/authorised-economic-operator/programme_en
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:384:0075:0078:EN:PDF
http://www.fao.org/docrep/005/y1579e/y1579e03.htm
https://www.itf-oecd.org/
https://www.storaenso.com/en/suppliers/logistics-services/logistics-supplier-information
https://www.unece.org/fileadmin/DAM/trans/doc/2014/wp24/CTU_Code_January_2014.pdf