NORTHLINE

Freight Preparation and Packaging

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1 Purpose

Northline transports goods right across Australia and overseas including remote communities and islands. Much of the freight travels significant distances and can pass through several points of handling before reaching its destination.

What may be considered sufficient packaging for a local or short distance delivery may not always suffice for long distance.

Insufficiently packed consignments present a high risk to the goods becoming damaged in transit and a serious hazard to drivers, freight handlers and on road users.

This Freight Preparation and Packaging document is intended to ensure:

- Compliance to Legislation in relation to Chain of Responsibility, in particular Load Restraint.
- Customers Goods will travel and arrive safely
- The goods can be safely handled by our drivers and freight loaders
- The goods can be safely loaded and unloaded from vehicles

2 Scope

This document covers freight types with photographic examples of acceptable and unacceptable packaging. These examples have been sourced from Northline's experience in transporting general freight throughout Australia.

Customers and their suppliers are required to read and be familiar with the contents of this document, in particular those persons involved in packing of items for transportation.

The scope of this document covers General Freight, which include cartons, pallets, skids, bundles, and crates.

If a Customer is in doubt about any aspect of this standard, or questions about if items being suitably packaged, then please check with our Salespersons or a National Customer Services team member

Note: *Customers may, from time to time, have packaging requirements which are outside or additional to those described in these standards. Northline may accommodate these. In these cases, this needs to be discussed with the Northline Salesperson prior to organising the consignment for dispatch.*

3 Customer Packing - Key Requirements

When consigning goods for transport handling or storage, the supplier must ensure that all items in the consignment are prepared, protected and marked in accordance with the following requirements:

- All packaging must be capable of withstanding road or rail transport over short, and long distances including some remote area rough terrain.
- All packaging must be suitable to endure multiple handling. Freight can be handled many times in the transport chain before it reaches its final destination.
- All packaging must be robust enough to cope with lifting on and off transport vehicles and being safely transported without rolling, tipping, sliding, or spilling.
- Packaging methods used must ensure safe delivery of the goods to the end destination. They must take into account the value of the item and the weight and size limits of cargo that is be transported.
- All items that are packed to be forklifted, need to have standard forklift tine pockets for access points that are 210mm wide x 80mm high.
- All items that require a Crane lift must have approved lifting and slinging lugs fitted by the supplier to facilitate safe crane handling.
- Goods are to be generally packaged in an upright and secure position unless they can travel in a flat configuration.
- Goods must not contain pests, vermin, soil, mud, grease, oils, or other process contaminants. Where timber is used, either internally and externally, it must be free of bark and insect infestation. Goods, particularly into Western Australia are required to be contaminant free and must be cleaned before transport to prevent any environmental or biological incident.
- Security sensitive items or other high value items must be packaged so that the items cannot be identified. Lockable pallet cages are recommended along with black (non-see-through) stretch wrap.

4 Consigning Goods - Marking / Addressing

All items consigned for transport must be clearly labelled and addressed. Cartons, skids, boxes, bags, crates, bundles or palletised goods must be clearly marked in English on two sides, as follows:

- Receivers Name
- Receivers Address
- State, post code
- If there is more than one item then the item number on the package is preferable, (for example, 1 of 4, 2 of 4, 3 of 4, 4 of 4)
- Dangerous Goods must be labelled according to the Dangerous Goods packaging standards contained in the most recent release of the ADG Code version 7.

Ideally, a Northline Web Freight or Customer generated Barcoded Label containing all Sender and Receiver details is to be used and will assist to expedite the transit and track and trace.

Any markings shall be durable, waterproof, fade resistant and able to withstand prolonged storage or bright sunlight and harsh conditions.

Address tags should be used in place where standard labels cannot be affixed to the goods. For example, bundles, mesh, steel or pipe. Any tags need to be affixed strongly (e.g. wired) and be non-rusting and durable.

To avoid confusion and possible misdirection, all old or previous markings, labels and references must be removed or covered.

4.1 Examples of acceptable markings

4.2 Special Handling Instructions on the Goods

If the goods are required to be handled in a certain manner, such as F*ragile, Keep Dry, Heavy, "This Way Up",* etc, then these instructions are to be clearly marked on at least one side of the goods to make them easily identified by the operations personnel.

Pictorial markings complying with AS 2852 Packaging –must be used to fully convey information regarding specific handling requirements.

Any special lifting points, centre of gravity, or slinging requirements must be clearly marked on goods.

5 Consigning Goods - Packaging Methods

5.1 Cartons, Boxes

The contents of cardboard cartons or boxes must be able to be supported by the cardboard carton or box. Cartons may be handled several times during the transport cycle therefore need to be strong enough to keep the contents supported and enclosed at all times.

Example: Contents must be packed tightly or blocked preferably with foam or bubble plastic to prevent damage or movement in transit.

All fragile goods must be placed in sealed cartons and packed in plastic cushioning, or some equally effective shock absorbent material such as polystyrene foam.

Fragile items should not be boxed together with heavy or incompatible items

Example: polystyrene foam assists to hold this drum in the carton

Example: photo left shows items were not packed adequately enough to prevent movement inside the carton.

Items have moved and are spearing out the end of the carton.

Carton Weight and Size limits

Northline have set a safe maximum weight and size limit for individual carton handling. Employee's, driver's and contractors are not expected to manually handle an item likely to affect his or her health or safety.

A limit is set at less than or equal to 30 kilograms in dead weight for an individual carton.

Additionally, the carton needs to be of a size and dimension that can be safely carried by one person if required to do so.

5.2 Pallets

The consolidation of items onto a pallet by strapping, shrink or stretch wrapping is a very good method to improve the safe handling and transit for multiple items.

Key Points to consider when palletising:

- The goods must not overhang the forklift entry points of the pallet.
- Stretch wrapping needs to be properly tensioned to hold the goods in place
- A board or sheet should be used at the base of a pallet to stop goods falling between the pallet boards
- Heavy items must be on the base with light items on top
- Do not stack too high so that the bottom layer items may crush
- Wrap several layers or stretch wrap at the base of the pallet so that the goods and the pallet are wrapped as one unit.
- Wrap extra layers or stretch wrap around and over the top of the goods to hold the top layers
- Strapping plus shrink-wrapping is required for multiple heavy or awkward items stacked on pallets, to prevent movement or collapse.

Example: well palletised goods.

The additional use of strapping and cardboard angles also improves the stability of a stretch wrapped pallet in transit.

Example: poorly stacked pallet.

Pallet is stacked unevenly (see white cartons) on top causing bottom layer to crush under the weight.

Example: poorly wrapped pallet.

Stretch wrap needs to be at a high tension and needs to be several layers (not a single layer).

The pallet here has insufficient layers of stretchwrap which has resulted in the goods shifting during transit.

Example: poorly stacked pallet of liquids.

Placing a board or sheet at the base of a pallet will assist with an even weight distribution.

The bottles of liquid in these cartons have been caused to leak due to the unevenness of the pallet boards and the uneven weight distribution.

Example: poorly stacked pallet of small cartons.

Small cartons have fallen through the gaps in the pallet boards underneath. Placing board or sheeting at the base of pallet would have prevented this.

Note: When placing board at the bottom of pallets the board should not be smooth (like Masonite), otherwise entire pallet consents may shift in transit

Example: poor quality pallet can lead to product damage.

Timber pallets need to have a Safe Weight Limit which is greater than the product it is carrying.

Low grade softwood pallets can collapse, and boards can come loose as in this example.

Well-constructed solid pallets with approved Weight Limit for the load of freight are recommended.

Example: poorly stacked bagged product on a pallet leading to damage.

Bagged product should be stacked so that it will not overhang or be caused to overhang a pallet during transit.

It is recommended that bagged pallets have:

- A sheet at the bottom to prevent sagging
- Be high tensioned stretchwrapped to prevent movement
- Preferable to have corner angles for extra strength.

Example: poorly packaged pallet of bags.

Loose bags on pallets are not an acceptable standard of packaging. Straps will not hold bagged product.

Pallets of bags must be stretchwrapped under high tension.

5.3 Skids

As with pallets items on skids must be secured so that they will be safe and not move during transport or handling.

The wooden skid itself needs to be sturdy, not damaged and enable a forklift to handle.

Packing heavy items on small wooden skids is not recommended.

Example: a steel bar came loose from this pallet which was just stretchwrapped and fell from the vehicle on the road.

Items like this should be fully crated

Example: poorly packaged cardboard skid items.

This cardboard skid was not adequate to contain these heavy loose metal brackets.

These items should be in a solid wooden crate

Example: poorly packaged item on a skid.

Strapping large and heavy machinery items to small skids can present a large problem during handling.

Small softwood timber skids are not appropriate to hold these items with metal strapping an can easily collapse.

This item is very top heavy, and the machinery could easily topple over during handling.

Items like this should be fully crated to ensure safe and proper handling and transport.

5.4 Cages

The use of pallet cages to transport fragile, awkward or multi item consignments is ideal and the best form of freight protection.

Consignments of multiple awkward or heavy items wherever possible should be caged for ease of handling.

Example: good use of cage for these heavy wheel casters will ensure safe transport.

A pallet cage is the preferred option for heavy solid objects that are unstable and need further support.

5.5 Timber Crates

Equipment such as electrical switchboards and panels, office machines and precision instruments should be packed within a wooden crate to prevent impact damage and any movement within the crate.

Equipment and materials must be packed to ensure an even weight distribution within the crate. Where this is not possible, particularly in the instance where a case or crate conceals the internal goods, the supplier must ensure that the centre of gravity and hoisting position are marked on two sides to ensure handling can be done in a safe manner.

Timber Crates are required to a have the following:

- solid timber structure all over and over the top so that the crate can be strapped, and load restrained during transit without any risk of collapse to the timber structure.
- Contents in the crate must be tied down or bolted or blocked so that the items will not be caused to move inside the crate.
- Must be constructed of solid timber and engineered to adequately contain and support the item.
- Have a Safe Weight Limit (SWL) that exceeds the weight of the contents.
- Constructed using screws, not nails, or staples.
- Additional metal strapping to hold the timber crate structure so it maintains its integrity is recommended.
- Must have bottom lift points for forklifting. Forklift pockets need to be wide enough to receive a forklift tine and strong enough to be lifted at these points without causing the crate to collapse or warp.

Example: a well crated item.

The timber frame is supported by metal strapping.

The addition of foam to protect the items from moving inside the crate is an improved method to protect the contents any potential damage though impact or movement

Example: a poorly crated item.

The contents (stone bench tops) are too heavy for the flimsy crate construction. The heavy items were not adequately restrained by the plastic straps, so movement has resulted in the crate collapsing.

Example: poorly restrained item inside the crate.

The machine inside this crate was not restrained and has broken out one end of the crate.

Machinery should be securely bolted and blocked in crates to prevent movement.

Example: poorly packaged item

Items like this should be in a fully enclosed crate to ensure proper transit.

Exposed metal, paintwork, dials and delicate instruments can easily be damage during handling so need to be enclosed to eliminate any risk of damage.

Example: Unacceptable packaging for transport.

This item should be crated to ensure proper transport

5.6 Bundles and Lengths

Heavy and long items that do not fit in a case or crate must be strapped with steel strapping to a skid or pallet so they can be forklifted. If packed on a skid, then the skid must have a SWL that exceeds the weight of the items.

The proper packaging of lengths is imperative to ensure their safe handling and transport. Often these lengths and bundles are required to be lifted by forklifts and placed on the ground which means they need to be protected from impact, scratching or denting.

Example: bundles are properly strapped for transit

Heavy steel or metal strapping/banding is required as in the examples here.

Bundles must have bearers strapped to enable forklift handling from underneath.

Example: poorly packaged bundle for transit

Any painted surface items must be packed in such a way that it can eliminate any damage to the surface through handling.

Lengths with exposed painted surfaces must be protected by heavy duty wrapping to prevent any damage to the surface.

Example: poorly packaged lengths for transit.

Multiple lengths must be bundled tightly to prevent any movement during transit. These could easily spear out during transit.

Bundles of steel need to be wrapped with metal banding / strapping for proper support

Example: inadequate protection of the ends.

Long bundles like copper pipe, can be prone to damage, particularly at the ends if not supported by a crate or on a full length timber skid.

5.7 Metal banding and Plastic Strapping

Metal banding can be very useful for consolidating lengths of steel, pipe and other solid objects into bundles and packs.

Caution needs to be taken when placing metal banding onto pallets and wooden skids to ensure the item of freight can be supported by the pallet or skid or frame. If the metal banding is too big or too tight it can slip off or cut through the timber pallet boards therefore making it a poor securing device to timber.

Example: acceptable packaging methods and use of metal banding.

Timber bearers are to be banded to the product making it easier for forklift lift handling.

Example: poor use of plastic strapping.

Strapping soft product (like this cardboard) is not effective enough to create sufficient tension and therefore bands will become loose during transport and product will move.

Example: poorly strapped goods, straps have loosened in transit.

The goods have been strapped to a low grade wooden pallet. The front pallet board has been loosened and pulled off by the tension of the straps. The straps therefore have loosened, and goods moved in transit.

Example: poorly packaged item

Plastic strapping is not designed as a load restraint device. Plastic strapping has not safe weight limit rating and can easily stretch or be cut around sharp pallet edges.

This item should be properly crated for transport.

Example: poor use of metal strapping

This metal strap has been placed directly around sheets of glass causing them to crack in transit

Strapping should not be directly over the freight items, but used in conjunction with cardboard, packing or metal angles to improve the hold and ensure the product will not damage.

5.8 Frames

Purpose-built transport frames must be designed and manufactured to Australian Standard AS4991 (Lifting Devices). They must also incorporate load restraints and lashing points as described in the National Transport Commission publication "Load Restraint Guide" 2004 edition.

No modifications must be carried out to the frames other than by the Original Equipment Manufacturers themselves.

If frames have not been manufactured to the above standards, or there is doubt regarding the adequacy of a transport frame, then Northline reserves the right to reject the freight.

Glass sheets, bench tops, stone slabs, etc, are best transported in upright Frames.

It is a requirement that these frames.

- are robust enough to carry the goods weight limit
- frame has bottom lift fork pockets
- frame has top lift rings. These rings have a safe weight lift limit.
- goods are restrained to the A-Frame
- goods are packed to absorb vibration

Example: properly framed glass for transport.

The frame has top and bottom lifting points and glass does not protrude beyond the frame.

6 Liquids

Example: Individual glass bottles will not be accepted unless the bottles have been placed in a carton and all bottles are packed safely so that there can be no movement inside the carton and bottles are not touching each other.

This is acceptable packing, but the use of additional foam packing to assist in the limitation of movement is recommended.

Example: acceptable packaging of 20 litre drums of liquid.

Liquids in plastic or steel drums are to be palletised and stretchwrapped tightly to ensure safe travel.

6.1 Lids and Plugs

All plugs, tops, and caps on liquids must be tightly screwed on and sealed. Where possible, goods containing oils or lubricants such as gearboxes, hydraulic components or transmissions, must be drained before transport, and carry a tag stating, "NO OIL".

Example: poorly secured lid resulted in spillage during transport.

Were liquids are transported in drums the lids must be secured tightly so that there can be no leakage.

7 Assembled Furniture - for General Transport

Assembled furniture is required to be packaged and wrapped to a high quality standard to be accepted for general transport.

Assembled furniture should be packed so that there are no exposed surfaces. Items need to be heavily wrapped in blankets, felt, bubble wrap or heavy duty cardboard. Furniture with readily detachable components shall be disassembled and individually packed to minimise any possible transport damage.

Example: this item is inadequately packed.

Stretchwrap may not protect the item during handling and transport.

Example: this item is acceptably packaged for transport.

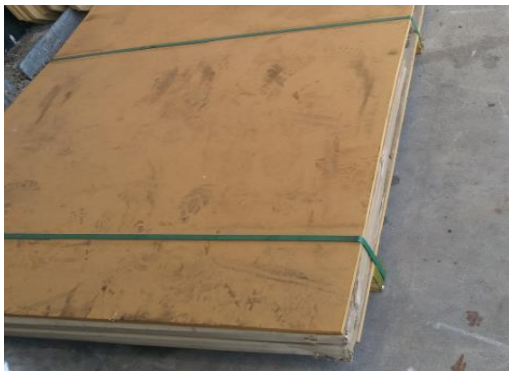
The item has felt, cardboard, tape and plastic wrapping to assist its transit. The edges have been protected by cardboard.

8 Flat Packed Products including sheets, lengths and board

The handling of flat packs often has to be accomplished by forklifts. Flat packs, therefore, should be either strapped to pallets or have bearers strapped underneath for forklift access.

When strapping to a pallet or skid the items must not be able to bend below the pallet when lifted but must be supported so that they remain flat.

Flat packs should have a TOP and BOTTOM (SOLID) packing sheet to protect its handling by the forklift or from potential damage to the top or bottom product.



Example: product is well packed.

Good use of top and bottom packing sheets.

The top and bottom packing sheet should extend beyond the product size to further ensure safe handling or damage to the edges.

Example: poorly packed flat pack.

The use of cardboard is not adequate to protect flat packed product (particularly fragile sheets) from being damaged during handling and loading.

Example: poorly flat packed item.

Cardboard could not support these loose items in transit.

Flat packs require solid top and bottom packing sheets

9 Long Rolls

The handling of long rolls often has to be accomplished by forklifts. Rolls are generally fragile in nature and require strong layers of protection around them to prevent any damage when being placed on the ground or on a load.

Long rolls require forklift handling, therefore need carpet prong access to be handled safely.

Long Rolls can be bound to a skid or wooden pallet, but the pallet needs to be able to support the length of the roll.

Example: poorly packaged rolls.

Rolls can easily be damaged by forklift handling when handled from the side. These rolls have no forklift end access and have been damaged by side access with the forklift.

A single layer of plastic is inadequate to protect these rolls from handling or transport damage

Example: poorly packaged roller doors.

These roller doors only have plastic and cardboard and could potentially be damaged by side access for the forklift.

Rolls, such as Roller Doors should have a solid metal packing sheet to prevent potential damage through forklift handling.

10 Freight with Wheels or Casters

Wheels or Casters on freight items are very prone to damage as they are not designed for support or for travelling over the varied terrain during freight handling process.

Example: caster wheels are not supported.

This cabinet has lost a wheel during transport handling.

Example: good packaging of item with caster wheels.

Wheels need to be otherwise supported so that they do not take any weight and the item can easily be manoeuvred without the use of the wheels.

11 Engines

It is a Northline requirement that Motors and Engines are packed so that, firstly they are self-supporting in a frame or in a cage and secondly all plugs are tightly done up and the engine is drained of any oil.

Example: inadequate packing of engine.

Engines are top heavy. Metal strapping to a pallet is not adequate enough limit any movement during handling or transport.

Engines must be supported in solid metal or wooden frames.

Example: acceptable packaging.

This engine is fully supported in a metal frame.

More adequate packaging than plastic wrapping is recommended to protect the surface of the engine.

12 Tyres

Tyres are to be adequately restrained to pallets suitable for the load.

Good quality heavy duty pallets in good condition without any damage or defects must be used, ensuring they are the appropriate size for the specific tyre dimensions and are free from nails and / or splinters that could damage the tyres.

Prior to use, pallets should be cleaned and inspected for any protruding nails or splinters which could damage the tyres or present an injury hazard.

Tyres must be placed evenly on the pallet, and to maintain stability tyres should not overhang the edge of the pallet.

Tyres can be stacked vertically or horizontally on a pallet depending on the tyre sizes and shape of each specific load. Ensure that the tyres are stacked securely and as such do not pose a potential tipping hazard.

Tyres are to be strapped to pallets to prevent movement (as below). Four (4) heavy duty straps are required on a vertically stacked pallet with the straps running through the middle of the stack. Tyres must be cross strapped to provide additional stability and then shrink-wrapped securely to the pallet. Straps must be tightened properly.

Shrink wrapping over the top of the strapping is desired in addition to straps as this helps to keep strapping in place once restrained to the trailer. The practice of securing tyres with the use of shrink wrap alone does not effectively restrain the tyres and as such presents hazards in the loading and unloading activities and during transport. This includes both pallet and stillage packaging.

13 Packing of Containers

When customers either Load or Consign full containers of goods the items inside the container must be packed and restrained so that there can be no movement of the goods inside the container during transit.

Under Chain of Responsibility legislation, a customer can be found guilty of a Load Restraint breach if consigning a full container and the items inside are not restrained.

Items in containers must be blocked, bracketed and/or bolted to the floor to prevent movement within the container.

There should be no gaps or unrestrained items in the container that could move in transit or be caused to move in transit.

14 Packing Dangerous Goods

The packaging, marking and transport requirements for the carriage of dangerous goods by road and rail shall be in accordance with the latest issue of the Australian Dangerous Goods Code (ADGC).

All dangerous goods shall be declared by correct shipping name, UN Number, quantity, type, packing group, and labelled in full compliance with the ADGC.

15 Gas Bottles

It is a requirement by Northline and under the Guidelines for the Transport of Gas Cylinders – ANZIGA. (Australia and New Zealand Industrial Gas Association) that gas cylinders be packaged and transported in an upright position.

It is also a Northline requirement that gas cylinders be transported upright in a metal stillage cage, or a crate or box which clearly provides equivalent cylinder protection and restraint as a metal stillage cage does.

Empty gas cylinders previously filled are deemed not to be empty and are Dangerous Goods freight.

New gas cylinders never filled are not classed as Dangerous Goods freight.

Examples: these packaging methods are not acceptable for any gas cylinders.

The laid down position and possible overhang on the pallets exposes a high risk of the regulators being damaged (causing the cylinder to become a projectile) and is likely to cause movement during handling due to poor load restraint and low friction due to steel on steel.

16 Relevant Standards & Other Related Documents

In preparing this document, the following documents have been used as resources:

- AS 2852 Packaging – Pictorial marking for the handling of packages.
- AS4068 - Flat pallets for materials handling.
- AS4762 – General-purpose flat pallets – Principal dimensions and tolerances
- AS2400.1 Packaging-Part1: Glossary of packaging terms.
- AS2400.6 – SAA Packaging code-Part6-Paper and Paperboard.
- AS2400.7 – Packaging-Part7: Timber boxes.
- AS2400.10 – Packaging-Part10: Protection against shock and vibration (cushioning);
- AS2400.18 – SAA Packaging code-Part18-Use of desiccants in packaging.
- AS4991 - Lifting Devices.
- Australian Dangerous Goods Code
- NTC Load Restraint Guide
- Australian and New Zealand Code for transport of Dangerous Goods by Road, Rail or Air.
- The IMO/ILO/ UN ECE Guidelines for Packing of Cargo Transport Units
- Northline standard Terms and Conditions

17 Definitions

Term	Definition
Bearer	Timber block separating the top and bottom decks of a n item or pallet and providing space for entry of tines (forks). Bearers may consist of blocks or continuous beams
Blocking	A method of interior packaging that builds up irregularly shaped articles to a regular shape to protect projections from damage, to reinforce weak parts and to maintain objects in fixed positions during transit, by bracing them against each other or against the sides of the container.
Safe Working Load (SWL)	Is the breaking load of a component divided by an appropriate factor of safety giving a “safe” load that can be carried or lifted.
Skid	A timber pallet smaller than a standard pallet. It has no weight or lift rating.