

Packaging Manual

The right packaging
for goods

DB SCHENKER: Take customers further!

This guide offers some of the minimum packaging requirements for our clients and its aim is to guide our clients, to design and optimize the packaging effectively for transportation in general terms and, under no circumstances, replace the instructions or packaging designed for a specific sector.

DB Schenker advises its clients to use this guide which demonstrate the minimum necessary standard to avoid shipments or equipment damage or injuries risks for responsible handling them. The failure to these requirements maylead to additional charges being applied for the use of special vehicles or extra handling.

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01

Maximum dimensions and weights of your shipments

The packages of DB Schenker network shipments – DB SCHENKER System/ DB SCHENKER System Premium - cannot exceed the maximum dimensions and weight limits, as it ensures the safe handling of the goods at our facilities and easy transportation via our standard fleet of vehicles.

The packages above 30 Kg must be packed and secured on a loading equipment e.g. Pallet, . The weight and dimensions limits for DB SCHENKER **System**/ DBSCHENKER **System Premium** are stated below.

Maximum dimensions and weight in our network (standard)

Product Characteristics	Maximum long side	Maximum short side (1,2 m for tail lift)	Maximum height	Maximum cargable weight per shipment*	Maximum weight per package	Maximum weight per package for CoDi
Premium	2,4 metres	1,8 metres	2,2 metres	2.500 kg	1.500 kg	1000 kg (800 kg in FR, ES, PT, PL, IT, SE)
System	2,4 metres	1,8 metres	2,2 metres	2.500 kg	1.500 kg	1000 kg (800 kg in FR, ES, PT, PL, IT, SE)

Estimated weight of the goods:

- 1 EUR pallet = 0,4 ldm=740 kg
- 1 HEP pallet = 0,2 ldm=370 kg
- 1 FIN pallet = 0,5 ldm=925 kg
- 1m³ = 333 kg
- 1ldm = 1850 kg

We offer our clients the possibility of transporting the oversized goods via our network. These long goods require special handling and the use of non-standard vehicles or machinery; this means that they incur additional costs that you will find the details about in our tariffs.

Special oversized or long goods are defined below:

Dimensions of Type 1 and Type 2 Long Goods (exceptions allowed)







02

Basic principles for packing your goods correctly

Packing and protecting the goods properly is essential to ensure the delivery in perfect condition, as well as assure the safety of the other goods and also the people handling them during the entire Transport chain.

The package above 30 kg without loading equipment (e.g Pallet) or poorly packed and/or protected for transportation could be rejected by DB Schenker.

Please ensure that your shipments are properly packed and protected and by paying attention to the below mentioned recommendation you can avoid tariff supplements for special handling

-  **01** Assess and choose the most suitable packaging for your shipment by taking into account the type of your goods. Try to use strong cardboard or wooden boxes on a base or pallet
-  **02** Secure and protect your goods from inside and outside Considering the possibility that your goods may be stacked during transportation. Always use non-stackable goods labels, in case your goods are not allowed to stack.
-  **03** Seal and secure the packages onto the base or pallet using strong restraint systems such as plastic straps or metal retainers that will help keep the load in place during transportation and handling.
-  **04** Mark the handling instructions for your goods with stickers. Be aware that the goods are handled manually or automatically and provide us all special handling instructions, if required.

Note: Please be aware that any package weighing more than 30 kg is considered as a heavy load and must be packed in a reinforced cardboard or wooden box on a base or pallet that will allow to access it with Material Handling Equipment.

Please follow the below mentioned steps that illustrate the basic requirements about packing your goods properly:







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2.1 Assess the packaging needs for your goods

Quality packaging is the key to prevent any potential damage. choosing the correct type of packaging for your goods is an essential step before sending them.

Here are some considerations that will help you to choose the best packaging for your shipments.

Be aware that some products such as food additives, perfumes, paints, solvents and some electronic equipment, amongst others, could be classified as dangerous goods and must comply with the current standards on packaging, marking, handling and storage requirements.

SHAPE AND SIZE		Protect the goods inside by wrapping also inside the boxes. Your goods must not be in direct contact with the outer packaging.
VALUE		Add extra protection for valuable goods.
FRAGILITY		Use instruction labels for special handling. Add extra protection for fragile goods.
REGULATIONS		There are certain types of goods that require special packaging and labelling (e.g. dangerous goods). Check the corresponding legislation.

Please also remember that there are certain types of goods that, due to their nature or special characteristics, are restricted for transportation on the DB Schenker network or could require specific procedures.

Please check the list of goods that are restricted for transportation on the DB Schenker network.

Get in contact with our Customer Service Department for more information.

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2.2 Choose the right materials to protect the inside and the outside

As described earlier, this guide will provide you with some minimum common standards regarding protection and packaging for a range of general use products. Please take into account the materials and instructions for specific packaging for each industry as a first option.

2.2.1 Protection materials for the inside of individual packages with a maximum weight of 30 kg.



- Choose the materials to protect the inside that are suitable for the purpose and characteristics of the goods that require protection.



- Fillers: Pellets/packing peanuts, air pillows, corrugated cardboard, bubble wrap, etc.



- Individual separators: Cardboard partition dividers, foam cushioning, corrugated cardboard, etc.



- Protection: Bubble wrap, foam wrap, corrugated cardboard, etc.

2.2.2 Protection materials for the outside of individual packages with a maximum weight of 30 kg.



- Mainly use top-quality wooden or corrugated cardboard boxes. For fragile or heavy (>20kg) goods, wooden or double or triple ply cardboard boxes should be used.



- Avoid reusing used boxes because they could lose some or all of their strength.

- Choose boxes with a suitable size for the items they are going to protect, avoiding a surplus of empty space inside as it could make them weaker.



- Apply plastic or cardboard corner plates to the outside to provide extra protection.

2.3 Seal and secure your shipments using packaging techniques that will ensure your shipments are well protected.



- Seal all the edges on the openings of your boxes (type H) with strong 5-cm wide self-sticking tape (masking tape, adhesive vinyl or fibre reinforced tape). Avoid using kraft paper tape, propylene sellotape or rope.

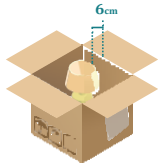


- Filling the spaces inside the boxes is important so as to avoid the packages moving around inside during transportation.

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- Use filling materials that are suitable for the goods contained in the boxes; some filling materials react to pressure or weight and could lose their protective properties.



- Keep the objects on the inside enough distance away from the outer walls of the box. This can prevent any damage in the event of vibrations or minor collisions caused during transportation.

- Use the double box technique where necessary when sending fragile pieces.



- Where possible, secure that the boxes on the base or pallet with suitable securing elements to avoid movement and ensure the stability for the different boxes on the base or pallet.

- Protect the final stack with corrugated cardboard on the outside or box pallets for better outer protection.

2.4 Label and mark your shipments properly

2.4.1 Clear and correct labeling is important for ensuring that your goods are transported quickly across the DB Schenker network.

Below are some key points to take into account:

DB Schenker provides a series of IT integration tools that will make labelling tasks and identifying your shipments easier. Please get in contact with our Customer Service Department for personalised information for your business.



- Attach the shipment label securely to the top right corner of the longer side that it is visible and cannot come accidentally unstuck.
- Do not allow other stickers, seals or documents to cover the shipment labels.
- Avoid reusing boxes, but if you decide to do so, make sure that all the old labels and stickers have been removed before reusing it.
- Putting a second label inside the package will help us to identify your shipment if the original label comes off or becomes damaged.
- If you need to apply other labels to your shipment, avoid putting them in the same area as the shipment label.
- Use a self-sticking plastic transparent window pocket to keep the documents that go with the shipment.

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2.4.2 The special handling instructions for your shipments must be marked with universal stickers with the appropriate size, shape and colors and must be stuck to the sides of the packages.

In this way, it is much easier and safer for our personnel to see and respect the instructions.

Below you will find some examples of the most commonly used labels:



THIS SIDE UP

The arrows show the direction in which the goods must be transported and handled.



FRAGILE, HANDLE WITH CARE

It contains fragile goods that must be handled with care due to the risk of them breaking.



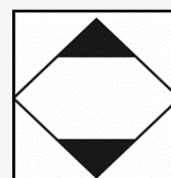
KEEP DRY

Goods that are sensitive to the damp; they must not be exposed to the outdoors or wet places.



NOT STACKABLE

The packages cannot be stacked or placed under any other types of goods.



Dangerous goods

The goods contain substances that when transported are a risk to health, safety, property or other goods.

03

Types of Pallets/Handling unit

3.1 Types and features of the pallets

Pallets are the most commonly used as standard loading equipment for transporting the consolidated shipments.

The pallets are available in different types and dimensions, but you have to choose the most appropriate one for the type of goods that you are shipping.



WOODEN

Strong, suitable for heavy goods. Reusable.
Easily available and cheaper than plastic. If the shipment is international, make sure that the wood is treated and complies with the specifications for the destination country. Make sure that the bottom of the pallet is reinforced in order to increase its stability.



PLASTIC

High loading capacity and anti-slip surface. It does not weigh a lot.
Resistant to damp and corrosion.
More expensive than wooden pallets.



CARDBOARD

Lightweight. 100% recyclable.
Single-use.
It is not suitable for heavy goods or wet places.
Cheap.

Using standard pallets is the way to avoid supplements for items with surplus volume. Standard pallets are considered to be those that do not exceed 120 cm in size on any of its sides.

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Protecting and securing the packages

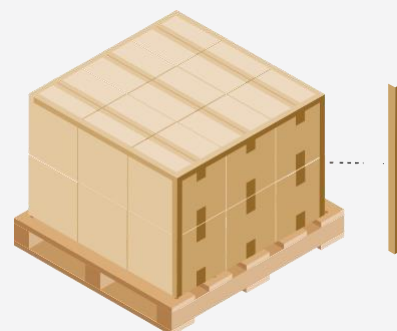
4.1 Securing and protecting standard packages on pallets

The main purpose of supplying the correct protection for shipments is to prevent damage to the goods during handling and transportation whilst also ensuring the safety of the people handling them.



Use the retention straps (plastic or metal) properly to secure the load onto the base of the pallet. This provides the necessary structural sturdiness to ensure that your shipment will be handled and transported safely.

Use the necessary protection elements so that the loading unit does not become damaged on any of its sides. Add reinforced cardboard padding or wrapping to the entire perimeter of the pallet.



Reinforce the protection on the pallet's edges by placing protective cardboard or plastic elements on the corners and shrink wrap it all with a plastic reel.

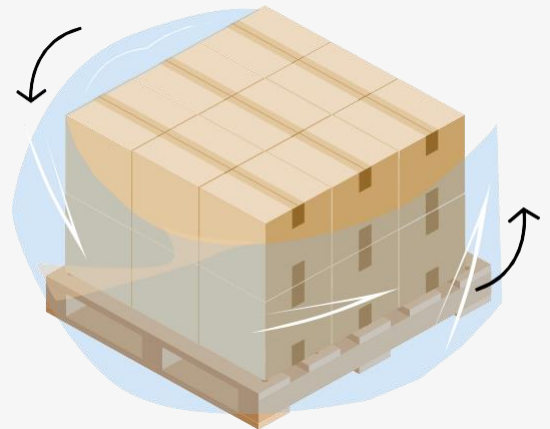
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The straps or shrink wrapping are the basic methods for securing the load to the pallet and must be used for large items or palletised shipments. The straps can be nylon, steel, polyester (PET) or polypropylene. Metal straps are the most suitable for sturdy items whilst nylon and PET straps are recommended for cardboard boxes and lighter contents.

If using a plastic strap or shrink wrapping, ensure that it is strong enough to create an unbreakable seal.

SHRINK WRAPPING

- Use plastic reels to shrink wrap
Fix the plastic to the top of the pallet and wrap it down to the base.
- Shrink wrap it tightly by turning it horizontally to cover the boxes.
- Keep shrink wrapping it until at least 50% of the pallet is covered with a second layer of plastic.
- On the top, cross over the plastic from corner to corner in a zig zag formation until it is completely covered.
- To finish, pull it downwards and wrap it around the base of the pallet.



STRAPS / SEALS



- If used correctly, straps are perfect for securing your shipment.
- If fitting the strap manually, secure the hollow bottom of the pallet upwards to secure the load vertically.
- Repeat this step in all directions until at least 4 straps are securing the load.
- Use horizontal edge protectors to prevent the straps from cutting into the boxes.
- Shrink wrap the pallet to protect it from damage during transportation.

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4.2 Securing and protecting specific content goods

Below are a series of specific tips for large and heavy items.

This will help you to protect your shipment and secure it for transportation on DB Schenker's network.

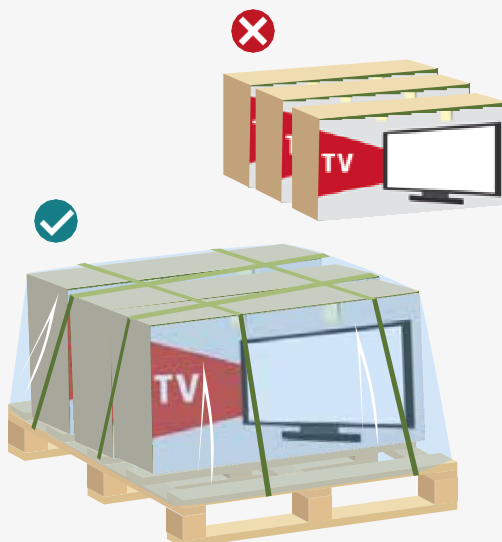
If your goods are not properly packaged, DB Schenker may apply a supplement to your shipment.

OIL DRUMS

- Oil drums must be packaged on plastic or wooden pallets with a distance between the panels on the lower base of 2 cm.
- On the top, the bottom and between the drums, fibre pads must be fitted to avoid them moving and becoming damaged during transportation.
- Secure the drum to the pallet using at least two strong plastic or metal straps. Use protectors between the straps and the drums to avoid them coming into contact during transportation.
- When sending several drums, strap them together before loading them onto the pallet.



LARGE ELECTRONIC EQUIPMENT

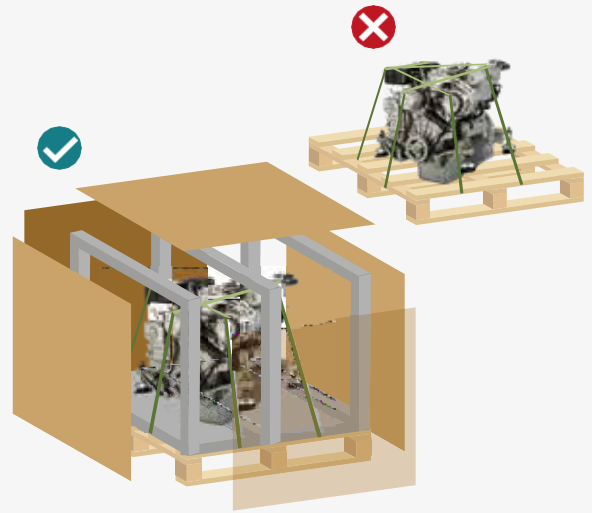


- If the manufacturer's box is not double ply, re-package the television in a double layer cardboard box.
- When sending multiple television, put them onto the pallets and avoid them overhanging.
- Fix them to the pallet with a strong plastic strap and fully shrink wrap the pallet.
- Place protective material on the top of the pallet and cardboard pads on all the sides to allow for other items to be stacked on top of them.

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VEHICLE ENGINES AND PARTS

- Engines and other vehicle parts must be packaged in wooden boxes or be anchored to a pallet with the sides and top lined with corrugated cardboard and edge protectors.
- Any liquids or fuels must be removed from the engine or the part before transportation.
- If they do not fit in properly, they must be packaged in a wooden box or placed on a suitably sized pallet which can be handled by a forklift truck.



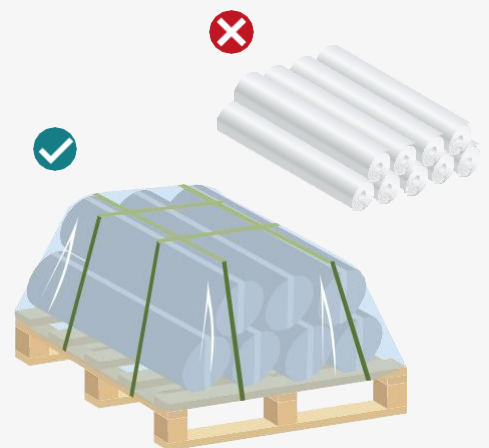
TYRES



- Tyres must be placed on pallets and secured with a strong plastic or metal strap.
- On the top and sides of the pallet, the cardboard, wooden or plastic pads must be fitted to protect the tyres and other shipments.
- If using special boxes for wheels, they must be strong enough to sustain the weight and keep the edges straight with no arching.
- DB Schenker does not transport loose tyres.

RUGS AND ROLLS OF FABRIC

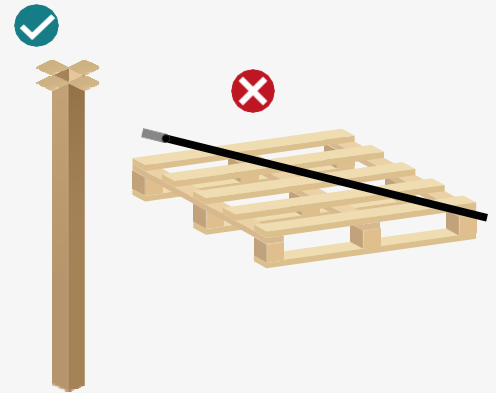
- Roll up the rugs on their narrowest side.
- To avoid them bending, the rugs and fabrics must be rolled up in strong cardboard tubes.
- The ends of the tubes or rolls must be protected with strong paper or cardboard.
- The rugs and rolls of fabric can be placed on pallets, but this must be done alternately and they must be secured with a strap and shrink wrapped for stability.
- If the item measures more than 120 cm or weights more than 30 kg, consider packaging it in a wooden box or on a base that can be handled by a forklift truck.



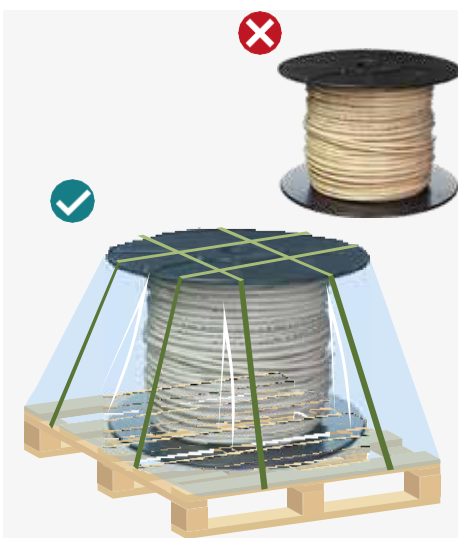
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LONG GOODS

- Long and narrow cardboard boxes are structurally weak and can become easily damaged.
- When sending long items, we suggest that you use triangular shaped packaging or sturdy cardboard tubes and place them in a square box.
- The outer box will stop them from rolling and becoming damaged during transportation.
- Package the long items that weigh more than 30 kg in a wooden box that can be handled by a forklift truck.
- Fix the tubes to the pallet with a strong plastic or metal strap and use wooden wedges on the base of the pallet to avoid them moving during transportation.



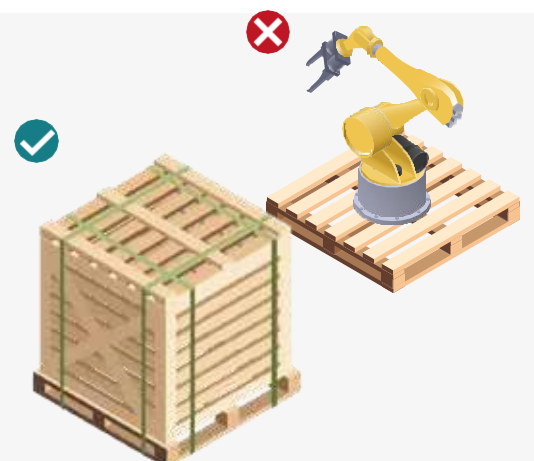
REELS AND ROLLS OF CABLE



- Reels and rolls of cable cannot be transported loosely and must always be placed on a pallet.
- To avoid any potential supplements, load the reel on its side onto a suitably sized pallet so that other shipments can be stacked on top of it.
- Very heavy reels (>50 kg) must be secured to the pallet with wooden wedges.
- The reel and the wedges must be secured to the pallet with strong plastic or metal strap (two horizontally and two vertically).
- If the type of cable on the reel is very sensitive, we recommend that you package it in a wooden box or protect the reel with corrugated cardboard.


INDUSTRIAL EQUIPMENT

- Industrial equipment must be packed in wooden boxes or be secured to a pallet with cardboard pads on the sides and on the top and protectors on the edges.
- All the liquids and fuels must be removed before transportation.
- Large and heavy pieces must be placed on a wide base to prevent any instability during transportation.
- Supplements are applied to shipments that cannot be safely stacked.



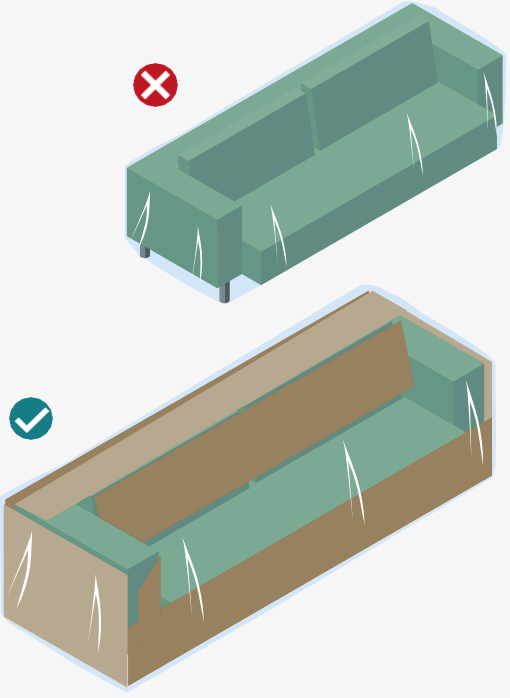
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WINDOWS AND GLASS PANELS



- Windows, screens and glass doors must be 6 cm from the outside of the wooden box or the double corrugated cardboard and packed inside a strong cardboard or wooden box to protect them from any bending, other boxes or mechanical equipment used for handling.
- Cover the edges of the piece with polystyrene moulds and then cover it again with bubble wrap.
- On the edges of the piece, insert special pieces of polystyrene the same size as the outer box to avoid movement inside and keep a distance.
- Once prepared as stated, the panel with the polystyrene moulds must be placed in a box
- Mark "GLASS" visibly on the entire perimeter.

FURNITURE AND LARGE DECORATIVE OBJECTS



- Send your new furniture or disassembled large decorative pieces separately where possible.
- Identify, number and group together the different parts on one piece in box and secure them onto a base or pallet
- Pieces that cannot be divided with surplus volume must be deposited and secured onto a suitable base or pallet, ensuring that edges do not overhang from the pallet's perimeter.
- Protect the piece with shrink wrapping before lining the sides and the top with wooden or corrugated cardboard pads and edge protectors.
- Finish by applying one last double layer of shrink wrapping to isolate the piece from any possible contamination from dust or smoke.
- DB Schenker only transports new furniture which will go on to be sold. The furniture and, generally speaking, any used goods are restricted on our network.

MATERIALS IN LARGE BAGS

- Stack the bags on the base or pallet in transversal layers without reaching the edge of the pallet.
- Keep a safety distance of 5 cm around the entire perimeter of the stack of bags in relation to the vertical side of the pallet.

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- The weight of the bags on the top could lead to the appearance of deformations for the bags on the bottom that overhang the pallet, exposing themselves to scuff marks and tearing that could cause a loss to the content.
- Secure the set of bags with a double layer of shrink wrapping, passing it several times under the base of the pallet to make a compact block.
- Protect the entire perimeter of the pallet with pads or corrugated cardboard reels up to a minimum height of 80 cm.
- Lastly, fit a pad or wooden cover or double-layer corrugated cardboard on the top of the pallet and shrink wrap it all again for better protection.
- Check that the total weight of the bags does not exceed the maximum load supported by the pallet and identify and mark it if the goods are not stackable.



SHOWER TRAYS AND COATED PANELS

- Reinforce the tray or panel with a frame with runners or a close wooden pallet, chipboard or MDF which measures at least 16 mm thick on all of its sides.
- Close it with a pad or wooden cover, chipboard or MDF, with a minimum thickness of 20 mm to support the weight of other stacked goods on top.
- Do not ship the valves, drains or connectors corresponding to each piece separately from its set, and do not stick it to its surface as it could become damaged being stacked on top of each other.
- Add a wooden box under the pallet for the valve or connectors so that they are protected during transportation and do not obstruct access to the pallet.
- For multiple shipments where several trays or panels are stacked in columns, apply anti-slip strips to the runners on the pallets and strap everything down to prevent the load from moving or slipping.



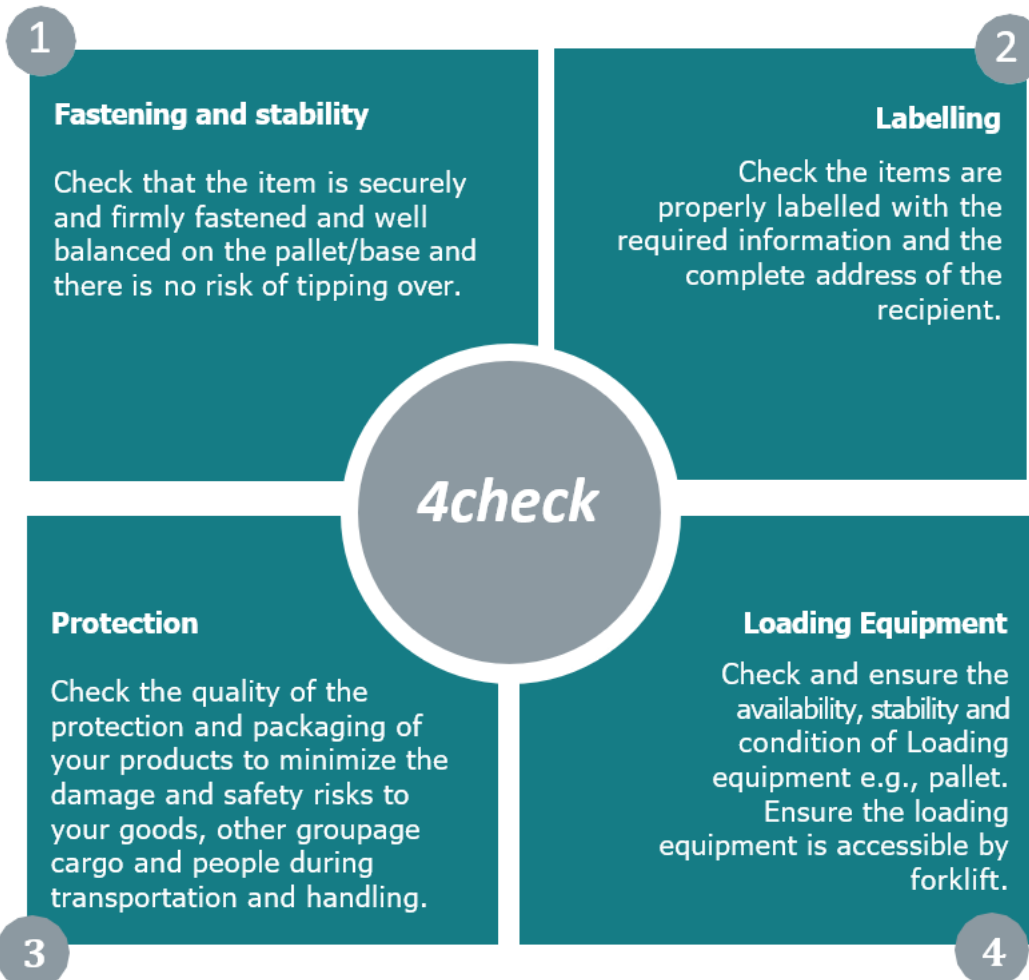
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Checking the quality of your packaging

5.1 Packaging analysis: DB Schenker 4Check concept

As we have described in this guide, the packaging quality and the way that the goods are prepared to be transported is of utmost importance because generally the safety and integrity of the transport from their origin to the final destination depends on this.

The 4Check concept simplifies and consolidates the analysis of your packing before transportation, alerting about the checks made on 4 essential points, namely:



Ensure that the packaging is strong, and the top is flat and sturdy in order to allow for other goods to be placed on top. If placing other goods on top is not feasible, it might incur additional transportation costs.

Suitable packaging is key to ensuring safe and damage-free transportation!

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