Restraining Full Loads (No Containment)

The following restraint system is one of a number of recommended ways of securing palletised product. If the freight is not "contained" i.e. using a van, pantechnicon, container or by using a specialised vehicle and no gates are used then;

If pallets blocked, one strap for every 2400 kg of mass per row of two Chep size pallets. That is for two pallets side by side each one strap will only restrain them against side movement if they each weigh on average no more than about 1200 kg. Conversely, if the pallets hold 2000 kg each (the design limit of a Chep pallet carried on a forklift) then two straps are required.

Blocking is an extremely valuable way of restraining a load against forward movement (0.8g). A vehicle headboard (e.g. front wall) is an effective method of achieving restraint against forward movement.

If you are unable to use a fixed means of forward restraint then the number of straps required will dramatically increase.

***If pallets NOT blocked, one strap for every 600 kg of mass per row of two Chep size pallets. That is for two pallets side by side each one strap will only restrain them against side movement if they each weigh on average no more than about 300 kg. Conversely, if the pallets hold 2000 kg each (the design limit of a Chep pallet carried on a forklift) then SEVEN straps are* required.** *Restraining each row of pallets individually should also satisfy the requirement of 0.5g in a rearwood direction.*

Where straps alone are used to restrain the load then a pallet angle placed against the entire square edge of the pallet must be used (see example on page 2). The pallet angle itself must have sufficient strength in order to withstand the clamping force generated by the strap and protect the freight.

In addition to the above guidance the integrity of the Pallet itself needs to be considered! Pictures shown below clearly demonstrate the importance of ensuring pack integrity and load restraint / load containment method is adequate to achieve the necessary 0.8g forward movement regulatory requirements.

Pack Integrity Testing

Recently performance testing of pallet assembly techniques and load restraint and containment methods has been undertaken.

Left: "Australian Transport Compliance Centres" test truck.

Right: Load shift during testing.

The results of the testing show that at best Fast Moving Consumer Goods pallets only achieved an average pack integrity <0.4g and therefore industry needs to adopt new restraint practices to adhere to the Load Restraint Guide regulations.

The only method of restraint that will meet the requirements is that of containment i.e. the use of gates - braced with straps or other certified system, or the use of pantec units.

The ALC wishes to acknowledge the contributions of Metcash, BlueScope and Toll who provided valuable input in the preparation of this guide. Further information can also be reference in the Load Restraint Guide – Second Edition 2004

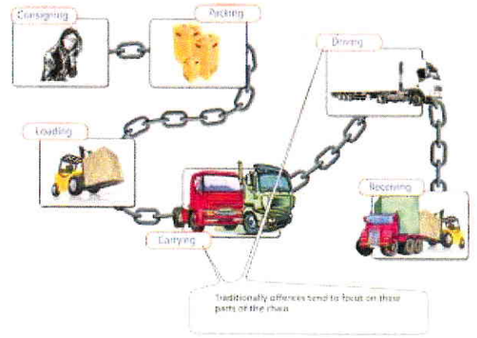
AUSTRALIAN LOGISTICS COUNCIL

RLSC RETAIL LOGISTICS SUPPLY CHAIN code of conduct

Safe Loads Guide
Load Restraint "Palletised Freight"

About this Guide

This guide provides information that applies to the safe loading of vehicles. The aim of this guide is to improve on-road safety and to provide all parties in the Chain of Responsibility the tools to help them manage their due diligence in this area of their business.



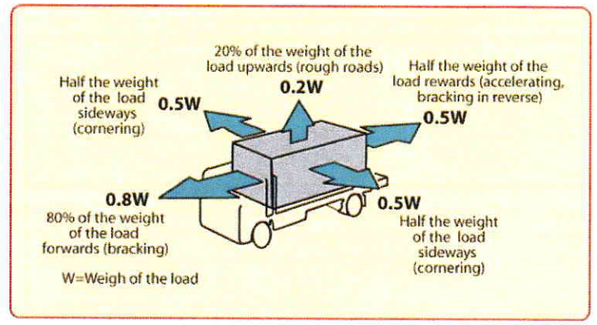
Chain of Responsibility

Any party who has control in a transport operation can be held responsible and may be made legally liable.

This applies to consignor / consignee, carrier, loader / packer, driver (i.e. all people involved in the transport chain).

National Load Restraint Requirements

Loads during transport are subjected to 'G' forces when cornering, stopping, accelerating, and in emergency situations. This can lead to various movements of the load, which may create serious hazards to both the driver and other road users. Shifting loads can cause serious destabilisation of the vehicle, or penetration of the load through the cabin, particularly in emergency braking situations. These 'G' forces must be taken into account when applying load restraint and load containment techniques or when specifying load restraint equipment.



"Liability for an offence will apply if a person knew, or ought to have known, that their actions breach a road transport law and / or is unsafe e.g. inadequate load restraint".

Within the Retail Logistics Supply Chain, freight is predominately moved on standard pallets, freight falls into one of two categories "Primary Freight" and "Secondary Freight".

Whilst in some circumstances, a layman could not differentiate between Primary Freight and Secondary Freight in real terms however the two are completely different and will often require different means of securing in order to comply with the Load Restraint Guide and Load Restraint Legislation.

Different Types of Loads

Full Loads

It is common for primary freight to be delivered to Distribution Centres in full loads. Palletised primary freight is generally a well constructed pallet i.e. one product line, the cartons are consistent in size and weight, the pallet is normally loaded so as the product fits neatly to the pallet. In most instances the cartons on the pallet are unitised i.e. secured with either stretch wrapping, shrink wrapping or the cartons are glued together with a light adhesive which basically adds to the friction between the layers of cartons. The pallet generally has straight edges, a uniform height and is despatched to a Distribution Centre as a full load or at least in multiple pallet configurations.

However, pack integrity testing (see pictures page 4) clearly show that not all pallets are well constructed and that some do lack pack integrity and therefore will require adequate restraint / containment methods to suit.

Mixed Loads (Many Product Lines)

Palletised secondary freight can be quite different, albeit that some secondary palletised freight is in fact a primary freight pallet that was merely cross docked at a distribution centre and then redelivered to a retail store as part of the stores replenishment order.

At the far end of the spectrum, the pallet of secondary freight frequently is made up of many product lines, different carton sizes / weights and often has uneven edges, lacks the integrity of the "primary freight pallet" and appears to look more like the peak of a mountain than a uniform, unitised pallet of freight.

As the degree of pallet integrity differs greatly between the two types of freight so will the system of load restraint.

Restraining Full Loads (Containment Method)

Primary freight is generally sent to the Distribution Centres as part of a full load so the uniform load of pallets can be stowed in such a way so as the bulkhead of the trailer provides the bulk of forward restraint force required under the law (0.8g). Gates and straps or walls provide the sideway restraint (0.5g).

Restraining Mixed Loads (Containment Method)

Secondary freight, which can be sent to the retail store as a full load, can be quite awkward in nature and will require a different form of restraint. In many instances containment may be the only way of achieving the requirements of the load restraint regulation. Containment can be achieved in number of ways, vans, pantechnicons and containers provide the simplest solution to load containment.

Specialised gate systems, reinforced tautliners and other specialised vehicles can provide adequate restraint via the containment method. Where conventional gates are used they must provide adequate restraint. Straps (load binders) conforming to the relevant standard will need to be used to either directly restrain the freight / load or provide adequate restraint using the gate and the strap (i.e. the strap over the gate). Using this method it is important to note that the gates must not be able to rack (move sideways). They must remain at 90 degree angle to the trailer floor at all times.

Examples of the different types of equipment needed.

Picture of AngleSafe pallet angle courtesy of AirTec Central

The pallet angle shown above is designed to rest on the cartons and not fall off. It is weighted on the top edge.

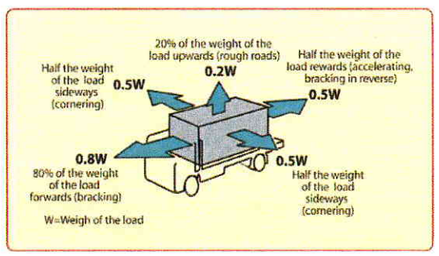
The pole next to the pallet slots into the angle to assist placement at heights

This trailer has a gate system that is fixed from the floor to the roof providing a rigid wall like restraint.

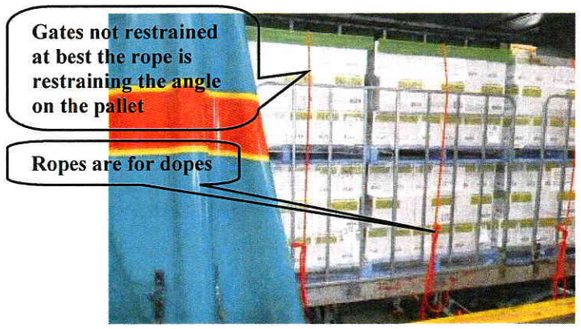
A load of primary freight secured by a fixed gate system

The testing required demonstrating that the fixed gate system complies with the regulation.

Regardless of what system you use you must be able to demonstrate that it provides enough restraint to satisfy the following;



This specialised trailer has an internal gate system (down the centre of the trailer as well as fixed side gates secured to the floor and the roof (providing a rigid "wall")



An example of how **"NOT"** to secure primary freight, the ropes do not provide sufficient clamping strength and it is highly unlikely that this method will satisfy 0.5 G sideways. (Remember ropes are for dopes!)

AUSTRALIAN LOGISTICS COUNCIL

RLSC RETAIL LOGISTICS SUPPLY CHAIN