



Competency 7

Loading and Unloading

Lesson Objectives:

- Recognize the hazards associated with loading and unloading
- Identify the loading and unloading locations according to the type of transport
- Resolve questions related to the arrangement of the goods
- Identify the physical forces that impact the driving, depending on the arrangement of the load, and that influence the securing method

The hazards

Most workplace accidents involving truck drivers occur during the loading or unloading of their vehicles. Depending on the type of load, the associated risks are more or less great.

Identify the hazards and risks associated with loading and unloading ~~a shipment for van transport in a closed van.~~



Find the error



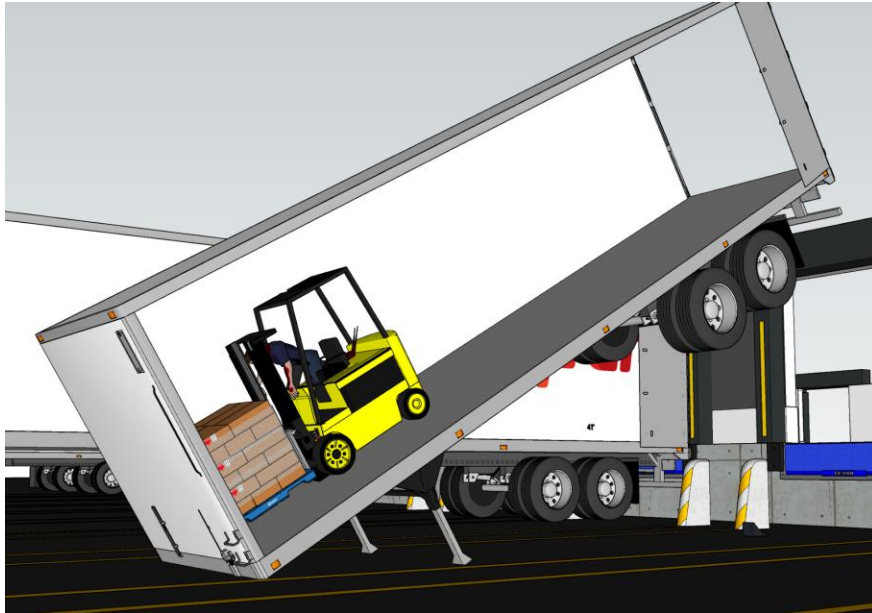
Find the error

Too many accidents happen because the vehicle leaves the loading dock without good communication between the parties involved. All arrangements must be made before taking action. What are these arrangements?





Uncoupling a semi-trailer can bring about certain hazards. What can be done to avoid them?



Delivery with tailgate

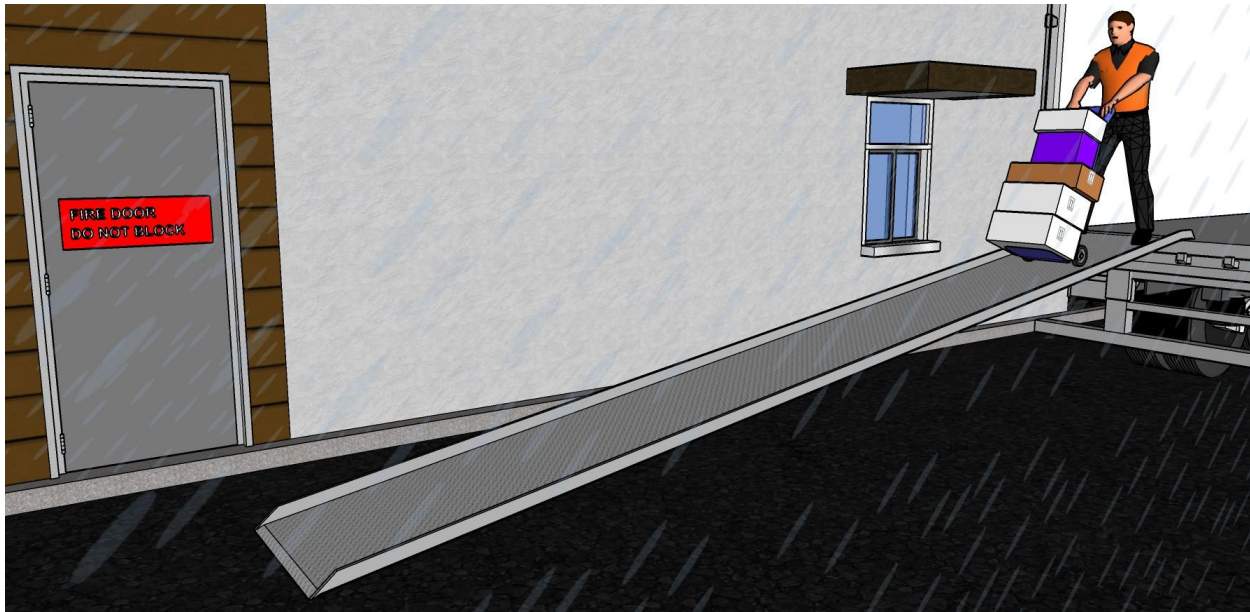


What are the risks?



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Delivery with ramp



What are the risks?

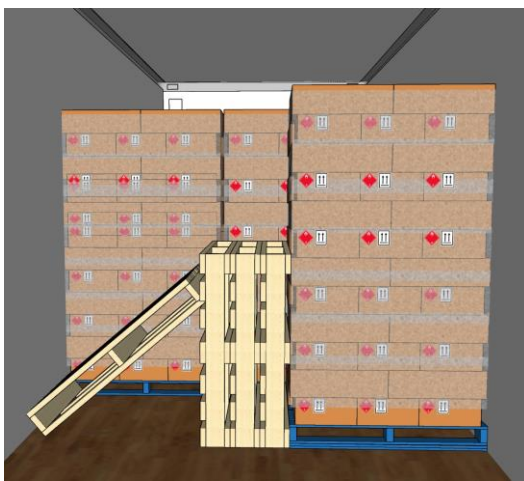
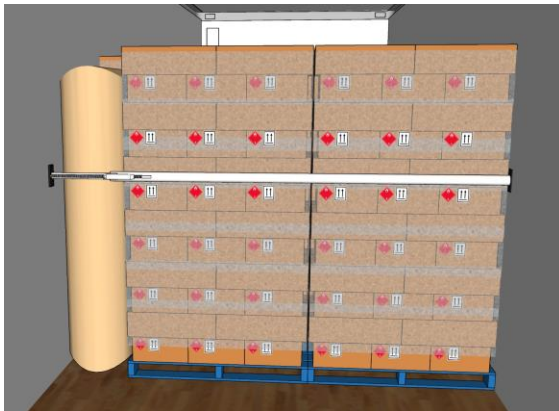
The loading of a dry box semi-trailer

Unlike flatbed trailers, securing is not required in a van-dry box trailer if:

- the cargo is firmly confined or immobilized by:
 - a vehicle structure of adequate capacity to hold the goods;
 - blocking devices, reinforcements, dunnage materials or bags, or shoring bars, also of adequate capacity.

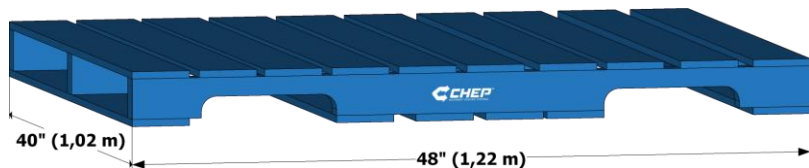


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The layout of a load

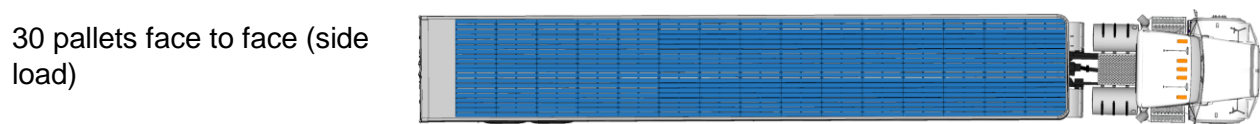
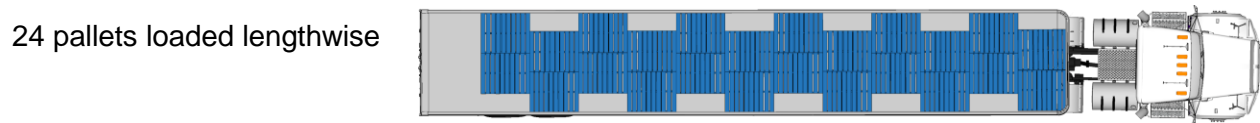
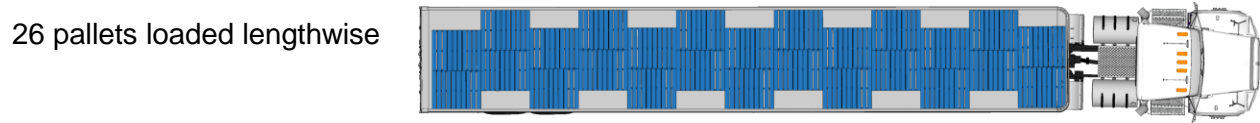
The arrangement of the load inside a dry box semi-trailer can be done in several ways. Weight and volume of the goods are the factors that most influence this arrangement.



In order to facilitate the loading and unloading of a van, the goods will generally be placed on pallets. Although there are several pallet sizes, the most common is 40" x 48" (1.02 m x 1.22 m). Some are returnable and some are not. Those that are not are said to be one-way pallets.



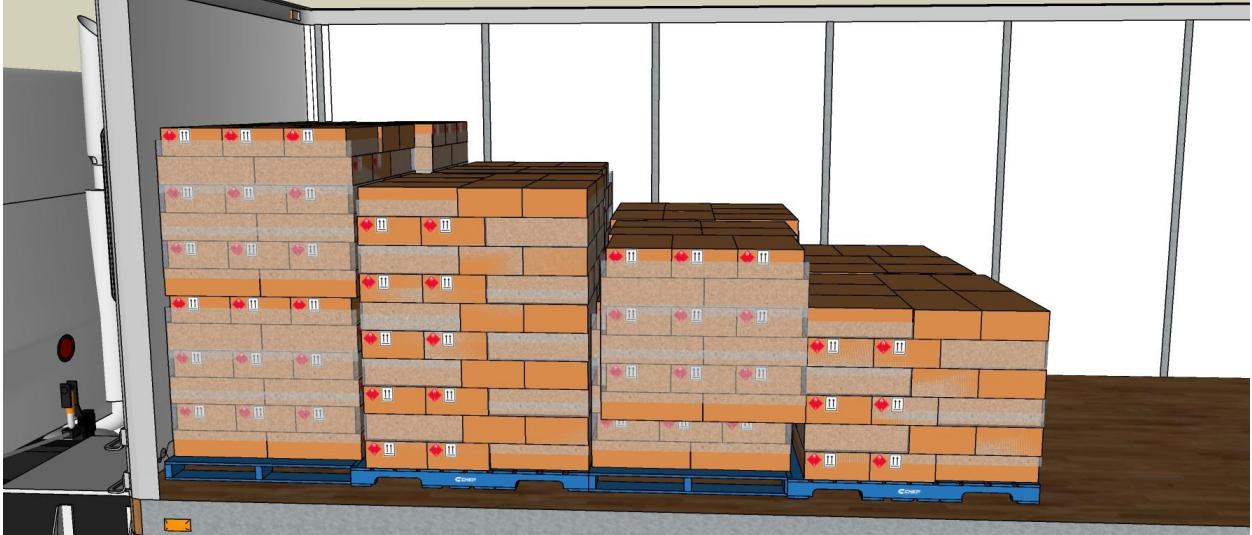
The following arrangements are examples made according to this format in a 53-foot semi-trailer.



Logistic semi-trailers

Logistic semi-trailers are equipped with a system that allows for the doubling of a van's loading capacity by adding a second level of supporting beams. Supporting beams can slide in rails that are attached to the walls of the semi-trailer. The height of the double floor is adjustable.





The tallest pallets should be loaded at the front.



If it is not possible to load all the tallest pallets in the front, then it is better to load them on the right side.

Reason: _____



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Securing and the laws of physics

Do you remember kinetic energy, that ball of energy that builds up exponentially in objects as their speed increases?



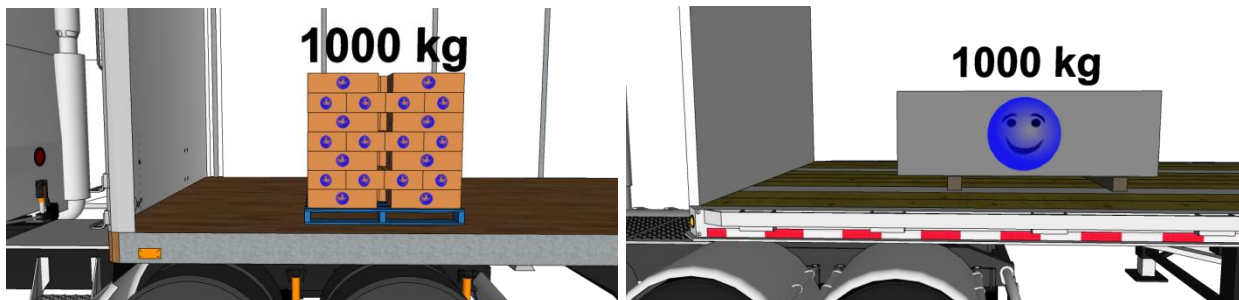
That same energy accumulated in an object doubles when the mass of the object is doubled.

Why is securing mandatory on a flatbed trailer and not in a van?

Actually, it is not the type of vehicle, but rather the type of goods that defines the rules. For example, steel coils weighing 1,000 kg have to be secured in a van or on a platform.

Same speed, same mass = same energy (same danger).

On the other hand, let's compare a pallet of cans with a mass of 1,000 kg and a block of concrete with a mass of 1,000 kg.



The energy accumulated in the pallet of cans is divided among all the boxes that are arranged on the pallet. So, we can say that the pallet is made up of small balls of energy which, therefore, are much less dangerous than the ball of energy accumulated in the block of concrete.

The regulations state that the walls of the vehicle must be capable of holding the cargo. In the example, the walls are capable of holding moving crates, but certainly not a moving block of concrete.

It can be said that the same energy value is divided by the number of boxes on the pallet.



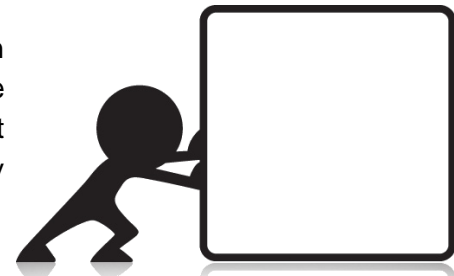


Imagine the same accident with a load of unsecured blocks of concrete.

The purpose of securement is to control the effects of this energy.

How do you do it? By using the principle of the friction technique.

Merchandise placed on the floor of a vehicle tends to stay in place. It is the work of the friction that exists between the floor and the merchandise. However, certain factors can act on this merchandise to make it move, for example, an icy floor, the weight of the merchandise or sudden braking.



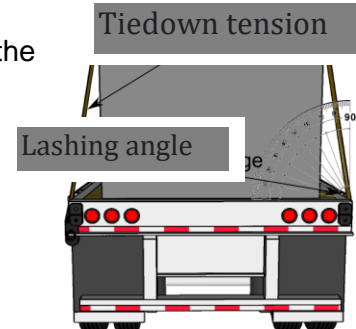
Therefore, the heavier the merchandise, the more it will be difficult to move. However, once in motion, it will be more difficult to stop (accumulated energy).

The basic principle of securement is to increase the friction of the cargo against the vehicle floor, but without increasing the weight (if the weight is not increased, the energy is not).

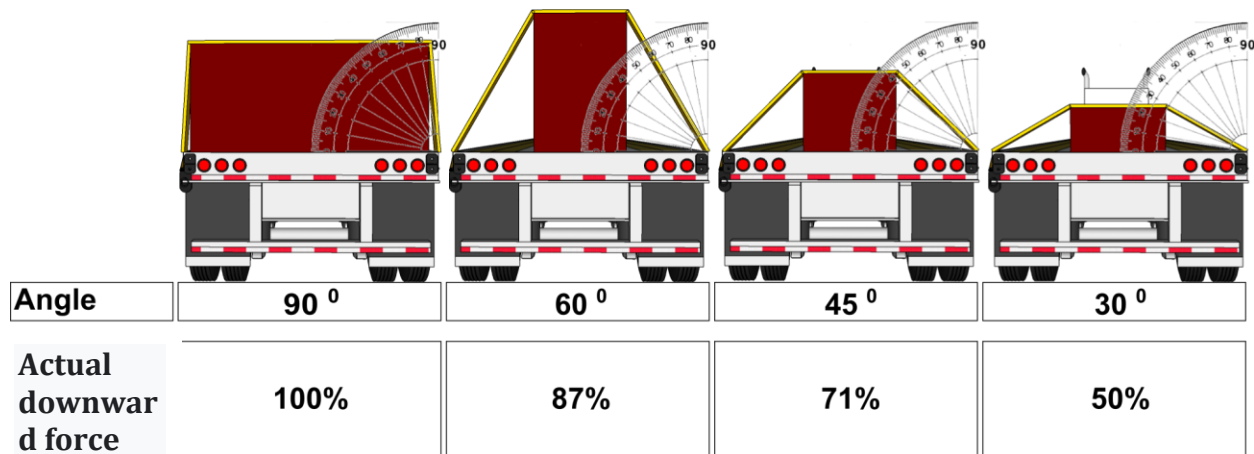
The tension exerted by the tie-down straps creates a pressure force on the cargo that is transmitted to the ground and increases friction. To achieve this **optimal value**, you must:

- that the cargo is rigid enough and cannot be deformed when the tie-down strap is tensioned;
- that the securement angle is between 83 and 90°;
- that the tie-down strap can be properly tensioned when it is put under tension.

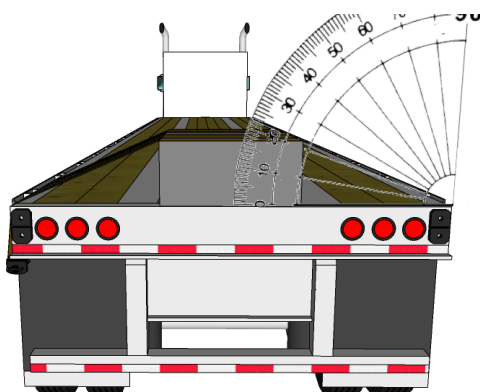
Stiffness of the goods



The angle of the tie-down strap to the horizontal line affects the amount of downward force.



In summary, if the angle of the tie-down straps is insufficient, **it would be ideal** to add additional straps to achieve the optimum value.



Friction

Let's look back at friction. It is the fundamental principle associated with securement. The coefficient of friction of the goods must be taken into account when we perform securement. Imagine the difficulty of moving, once again, a block of concrete on a wooden floor compared to a steel beam on the same floor.

Here, your judgment is paramount. There is no tool that measures the coefficient of friction of the cargo to be stowed. If in doubt, additional tie-down straps should be used.





Before loading, it is important to clean the floor of any particles that could make it slippery. It needs to be cleared of snow and ice. Use salt if necessary.

Spacers

The spacers play two roles. First, they are used to facilitate the handling of the goods by the forklift. Also, they are used to concentrate the mass of the goods in a smaller space. This results in a higher coefficient of friction, which makes it more difficult for the goods to move.



Mats with a high coefficient of friction

This type of mat is widely used in the transport of paper rolls. It is a rubber mat specially designed to increase the coefficient of friction between the cargo and the vehicle floor.





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