

THE IMPORTANCE OF STOWAGE AND FIXING OF DANGEROUS GOODS IN ROAD TRANSPORT

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INTRODUCTION

In Europe about the 73% of goods are transported by road (number refers to the tons of goods per kilometer handled inside the European territory).

In Italy this percentage is more higher (approx 88%), due to a rail system less efficient than other countries and an orography that does not help; anyway, actually the percentage of explosive goods sold by EPC-Italia that travel by road is the 100%, for both logistical and bureaucratic reasons.

A good part of this goods are moved by third parties companies, especially with regard to shipments of large-scale, in fact EPC-Italia does not have TIR, only vans.

Road transport is a vital economic sector in its own right, employing about 5 million people across the EU and generating close to 2% of its GDP.

With the continuing of the economic crisis, the age of the vehicle pool in circulation is increasing more and more, to the detriment of road safety.

People also travel mainly by road, with private cars accounting for 73% of passenger traffic in the EU.

All these data lead us to believe that the safety on transport of goods by road is one of the most important aspects of our business.

A RECENT ACCIDENT

At the end of July 2013 a third-part carrier went with his TIR to a warehouse in the south of France, to load several pallets of explosives to bring in a warehouse in north Italy.

At the arrival in the Italian depot, the load appeared overturned and damaged as shown in Figure 1.



Figure 1: the explosive overturned at the warehouse of destination

What happened?

All the pallets present on the TIR was overturned on the same side.

- ✓ French loaders (warehouseman) and Italians carriers (drivers) have loaded the goods very bad, because they all lined up the pallets one behind the other on the truck, without seeking joint putting side by side as it would be correct (two by two).
 - ✓ In addition to this, the two drivers doesn't have firmly tied the load to the TIR before leaving, and probably they have driven without care of what they were carrying.
- ⇒ This underline the total lack of awareness about the hazards of explosive products and their properties. They said they haven't noticed anything during the trip, which is very unlikely, probably in order to avoid a recall by their employer.

No one was injured and nothing of really serious happened this time; fortunately the boxes have held up well and there has been no rupture of boxes after the overturning and consequent spillage of material.

Our employees in warehouse has not been able to fast download the goods using the forklift as usual; an entire afternoon and the work of 5 peoples (2 drivers + 3 warehousemen) has been lost to move all the boxes by hand (each of them weighs about 25 kg), and rebuild the pallets on the floor prior to storage them with the forklift. Obviously this has caused a delay in loading and unloading of other trucks coming in depot.

For this reason it has been decided that in the future the Depot's Responsible may decide to not unload goods from trucks if find in these conditions, and send back the goods at the expense of the carrier.

What could have happened?

This incident could lead to much more serious consequences in case the explosive transported would be more sensitive to shocks, or if case the explosive was leaked from its packaging.

In case of spillage:

Inerting a leak of explosive material is not easy; our warehouse's staff has been properly trained for this task, but we can't say the same for the entire staff of the companies that transports on our behalf.

In the Depot where the incident happened, in front of every warehouse there is an aluminum Safety Box in which there is material useful in case of spillage of explosive substances; in it are contained:

- a shovel in aluminium, non-sparking
- gloves, masks and eye mask in transparent plastic
- some plastic bags
- copy of the operating instructions in case of spillage
- copy of all the Safety Data Sheet of products presents in Depot
- list of references and emergency phones

Next to it there is also:

- a plastic bin full of water
- a bucket full of sand
- 2 powder extinguishers



Figure 2: some Safety Boxes in different places of the Depot

THE PROPER STOWAGE AND SECURING OF GOODS DURING TRANSPORTATION. WHO IS RESPONSIBLE?

A brief consideration should be made on how to assemble the pallet; too often we noticed that the pallets are packed hastily and the plastic film that encloses the boxes on the pallet is too thin or poorly rolled.

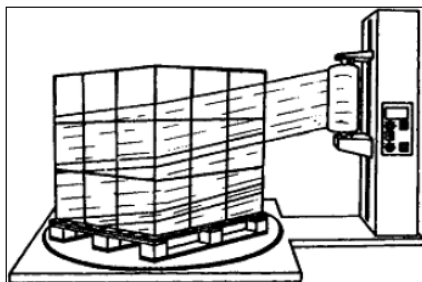


Figure 3: packaging with stretch film

Research responsibilities in the field of cargo and transportation of dangerous goods it is important to resolve non-compliance or litigation arising from incidents such as the present. We are talking of dangerous goods, and therefore the reference text, quite clear and precise, it is the ADR. The new edition, issued in 2013, contains important innovations in the field of stowage and securing of cargo in road transport of dangerous goods in Class I. First let's start with some definitions, and with the identification of the figures involved.

1.4.1 General safety measures

- 1.4.1.1 The participants in the carriage of dangerous goods shall take appropriate measures according to the nature and the extent of foreseeable dangers, so as to avoid damage or injury and, if necessary, to minimize their effects. They shall, in all events, comply with the requirements of ADR in their respective fields.



1.4.2.2 Carrier

- 1.4.2.2.1 In the context of 1.4.1, where appropriate, the carrier shall in particular:
- (a) Ascertain that the dangerous goods to be carried are authorized for carriage in accordance with ADR;
 - (b) Ascertain that all information prescribed in ADR related to the dangerous goods to be carried has been provided by the consignor before carriage, that the prescribed documentation is on board the transport unit or if electronic data processing (EDP) or if electronic data interchange (EDI) techniques are used instead of paper documentation, that data is available during transport in a manner at least equivalent to that of paper documentation;
 - (c) Ascertain visually that the vehicles and loads have no obvious defects, leakages or cracks, missing equipment, etc.;



1.4.3.1 Loader

1.4.3.1.1 In the context of 1.4.1, the loader has the following obligations in particular:

- (a) He shall hand the dangerous goods over to the carrier only if they are authorized for carriage in accordance with ADR;
- (b) He shall, when handing over for carriage packed dangerous goods or uncleaned empty packagings, check whether the packaging is damaged. He shall not hand over a package the packaging of which is damaged, especially if it is not leakproof, and there are leakages or the possibility of leakages of the dangerous substance, until the damage has been repaired; this obligation also applies to empty uncleaned packagings;
- (c) He shall, when loading dangerous goods in a vehicle, or a large or small container, comply with the special requirements concerning loading and handling;



CHAPTER 7.5

PROVISIONS CONCERNING LOADING, UNLOADING AND HANDLING

7.5.7 Handling and stowage

7.5.7.1 Where appropriate the vehicle or container shall be fitted with devices to facilitate securing and handling of the dangerous goods. Packages containing dangerous substances and unpackaged dangerous articles shall be secured by suitable means capable of restraining the goods (such as fastening straps, sliding slatboards, adjustable brackets) in the vehicle or container in a manner that will prevent any movement during carriage which would change the orientation of the packages or cause them to be damaged. When dangerous goods are carried with other goods (e.g. heavy machinery or crates), all goods shall be securely fixed or packed in the vehicles or containers so as to prevent the release of dangerous goods. Movement of packages may also be prevented by filling any voids by the use of dunnage or by blocking and bracing. Where restraints such as banding or straps are used, these shall not be over-tightened to cause damage or deformation of the package¹. The requirements of this paragraph are deemed to be complied with if the cargo is secured in accordance with standard EN 12195-1:2010.

The application of this European Standard is new in the ADR 2013. This technical standard provides guidance on the anchor of goods in vehicles and containers for loads of total mass over 3,5 tonnes, specifying the method of fastening the load, number of belts to be used and their technical characteristics.

In addition to it, we must respect the best practices to improve the safety of cargo in road transport dictated by the European Commission - Directorate General for Energy and Transport.



Figure 4: examples of blocking of the goods using some fillers

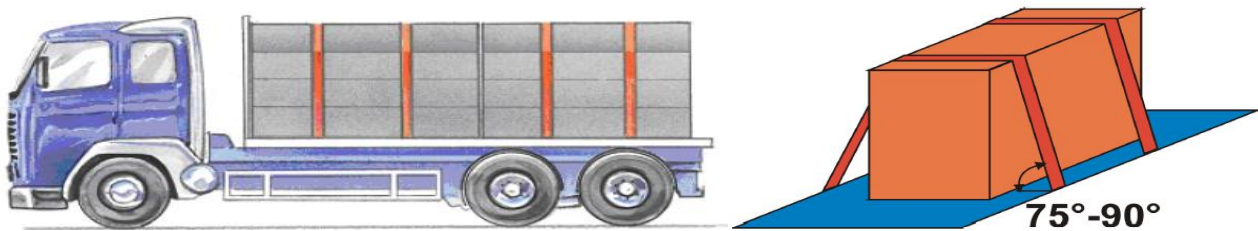


Figure 5: examples of anchorage of goods using straps

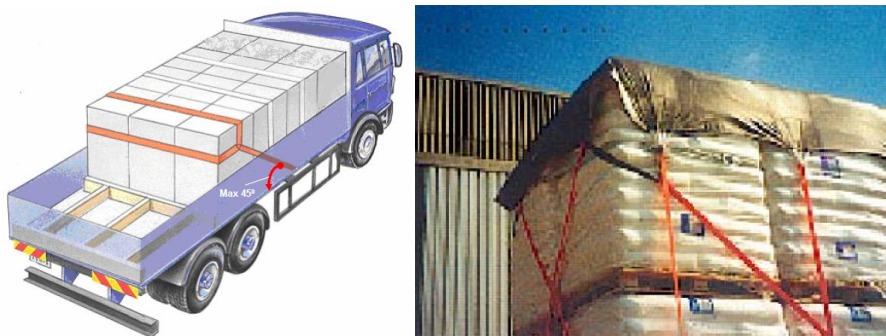


Figure 6: example of anchorage anti-rollover using elastic straps

Back to our case, the third-part transporter is at the same time Carrier and Loader, and as shown by the ADR he has most of the blame in the event of damage to the goods during the carriage.

BUT also a part of the responsibility is attributable to the Loader (staff of the factories and warehouses from which the goods starts), who must ensure that the carrier has arranged and secured the goods so that it can't move during the trip.

WHAT HAVE WE DONE TO PREVENT A RECURRENCE OF EVENTS LIKE THIS?

The staff of our warehouses is the Loader, so we decided to organize a training in all warehouses in Italy regarding the following topics:

- Update on the correct procedures for loading and unloading
- The intrinsic properties of the explosive products marketed by EPC-Italia
- How to act in case of spillage of explosive
- How to behave in the event that a carrier does not comply with the provisions of the ADR relating to the securing of cargo

This training took place during the months of September and October 2013, in 11 different warehouses, and was attended by 61 people (not only EPC-Italia's employees but also staff from third party warehouses or staff of transport companies). To all these people were given a certificate of participation.

The procedures given provide that, in the event that a carrier refuses to insure the goods to the vehicle with all available devices, this should be reported immediately to the Depot's Responsible; he has the right to deny that the vehicle left the warehouse with the load.

Full cooperation it's needed between the companies that are responsible for stocking and those engaged in the transports, where (as in EPC-Italia) they aren't the same company. This is the only way to really pursue a real prevention against accidents of this type.

REFERENCES

European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) – edition 2013

<http://www.unece.org/trans/danger/publi/adr/adr2013/13contentse.html>

European Commission – Mobility and Transport

http://ec.europa.eu/transport/modes/road/doc/broch-road-transport_en.pdf

European Standard EN 12195-1:2010 – Load restraining on road vehicles - Safety - Part 1: Calculation of securing forces