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## **LEGISLATION AND CONDITIONS FOR DANGEROUS GOODS TRANSPORT BY ROAD**

### ***Abstract***

*An explosion is a chemical reaction of an explosive or explosive mixture. Explosives are capable of an extremely rapid exothermic reaction associated with the formation of a large volume of high temperature gases. This reaction is usually triggered by initiation, which is the result of improper handling or other mechanical, thermal or electrical stimuli. Proper handling, especially of dangerous goods, is essential. Authors in their contribution approach the legal regulation and conditions for dangerous goods transport by road.*

**Keywords:** *explosion, explosive, flammable substances, dangerous goods, legislation*

### **INTRODUCTION**

An explosion is an unexpected oxidation reaction of an explosive or explosive mixture. This reaction is triggered by initiation or other stimulus. Explosive mixtures may contain substances of an explosive nature, auxiliaries or even substances which do not have explosive properties. Part of such a mixture, which consists of non-explosive substances, is generally a suitable fuel and oxidizing agent, which supplies the chemical reaction with the oxygen needed for combustion, because the amount of oxygen supplied from the ambient atmosphere is not sufficient to burn the mixture in a sufficiently short time. According to practical use, we divide explosives into explosives, which are easily ignitable explosives and usually serve to initiate explosives or ammunition, explosives that are normally insensitive to external influences and, conversely, can detonate at high detonation velocity after initiation and finally ammunition. are used as a projectile for ammunition for firearms for military, sports and hunting purposes. Explosives also include, in part, pyrotechnic mixtures, which are mixtures of combustibles, oxidizers and other auxiliaries that produce the relevant pyrotechnic effect. [1]

The risk of explosion and thus the occurrence of an emergency is closely related to the transport of dangerous goods. These substances and their negative properties can endanger human life, health as well as cause

significant property damage. In our contribution, we will therefore further focus on the area of legislation and the conditions for transport of dangerous goods. Due to the level of possible risk caused, we will focus on transport by road.

### **DANGEROUS GOODS TRANSPORT**

The transport of dangerous goods have a special position on the transport market. Economic and industrial development means that explosive, toxic, corrosive, self-igniting or otherwise dangerous substances and articles are increasingly being transported worldwide. The risk associated with this transport is growing. Of course, in the interests of safety, these special transports must be governed not only at national but also at international level by strict regulations. This applies, inter alia, to the design of vehicles, the packaging and loading of dangerous goods, their marking, their correct declaration in transport documents. [2]

### **LEGAL REGULATIONS FOR DANGEROUS GOODS TRANSPORT IN INTERNATIONAL CONTEXT**

The Slovak Republic is bound by a number of international treaties, regulations and agreements in the field of safety based on the Model Regulations of the Recommendations for the Transport of Dangerous Goods issued by the UN. On this basis, the transport of dangerous goods is ensured by international agreements ADR, RID and ADN. These agreements are among the most important conventions governing the conditions for the transport of dangerous goods between States. [4]

***RID** (International Regulation concerning the Transport of Dangerous Goods by Rail)* is an international agreement for the transport of dangerous goods by rail. It describes the classification of dangerous goods, including classification criteria and relevant test methods, requirements for driver training, requirements for the use of packaging, tanks and means of transport.

***ICAO/IATA** (International Civil Aviation Organization)* International Civil Aviation Organization. It is an agreement on the transport of dangerous goods by air in the territory of the Slovak Republic, as well as in other countries of the ICAO/IATA agreement according to the client's requirements. The ICAO Committee approves standards and recommended practices for air navigation, protection against unlawful disturbance of airspace and simplified border crossing procedures for civil aviation. In addition, ICAO defines air accident investigation protocols for traffic safety authorities in countries signed in the Convention on International Civil Aviation, also better known as in the Chicago Agreement.

**ADN** is a European agreement on the international transport of dangerous goods by inland waterways. This Agreement shall not apply to the carriage of dangerous goods by seagoing vessels on inland waterways which form part of inland waterways.

**IMDG - CODE** is an international agreement for the transport of dangerous goods by sea. The transport of dangerous sea cargo is subject to VII. Chapter of the International Convention for the Protection of Human Life at Sea - SOLAS.

**ADR** (*European Agreement on the International Carriage of Goods by Road*) is a basic international legislative standard in road transport, which regulates the relations and conditions under which it is possible to carry out the transport of dangerous goods. The basic wording of the ADR Agreement is relatively brief and contains two annexes: Annex A, general provisions on dangerous substances and articles, incl. dangerous substances and objects excluded from transport; Annex B provisions on road vehicles intended for the transport of dangerous goods, operational requirements and transport technologies, incl. cargo handling. The agreement divides the transported goods into classes according to the type of danger and determines their degree of danger by letters a, b, c. According to this designation, a packaging group is assigned which defines a suitable packaging material. Some dangerous goods must be transported on the prescribed means of transport or the prescribed mode of transport. [7]

Vehicles carrying these loads must be properly marked on the front and rear of the vehicle with the prescribed warning orange plates and on the rear and sides with the prescribed safety signs in the shape of a diamond with the danger symbol. The UN code is the identification number of the substance. It is a four-digit numerical code according to which the dangerous substance is clearly identifiable, which is important especially in the liquidation of accidents. This code is part of the written instructions of the driver, consignment note and is also located at the bottom of the orange warning sign located on the vehicle. At the top of the table is the hazard identification number, the so-called Kemler code. It is a two- to three-digit combination of numbers indicating the type of hazard, sometimes supplemented by an X. [4]

The obligations of the carrier in the transport of dangerous goods by road includes to:

- ensure that the transport of dangerous goods does not endanger the life and health of persons, animals, plants or other components of the environment,
- ensure that vehicles comply with the design requirements and, if required, ensure that the vehicle is fitted with a vehicle approval certificate,

- ensure that written instructions in accordance with ADR are in the vehicle,
- ensure that the vehicle or vehicles transporting dangerous goods are accompanied by other professionally qualified persons in addition to the crew, if so provided by an international agreement,
- provide the vehicle with special equipment according to written instructions,
- ensure the retraining of persons involved in the transport of dangerous goods,
- appoint a safety adviser for the transport of dangerous goods. [11]

The duty of the crew when transporting dangerous goods is to:

- find out about the nature of transported dangerous goods,
- check, before the start of the transport of dangerous goods, the correctness and completeness of the prescribed accompanying documents, which the consignor is obliged to process and deliver,
- mark the vehicle transporting dangerous goods with orange plates and safety stickers and ensure their removal after the end of such transport,
- familiarize yourself with the content of the written instructions before the start of the cost,
- take the measures set out in the written instructions in the event of an accident or emergency,
- do not accept for transport a piece whose packaging is damaged,
- submit to control bodies accompanying documents, fire extinguishers and special equipment,
- if the cargo is performed by the crew, comply with the provisions concerning the cargo, unloading, handling of dangerous goods, mode of transport and supervision of the vehicle,
- the driver must not transport persons who do not belong to the vehicle crew,
- be properly acquainted with the operation of fire extinguishers,
- a ban on opening piece consignments,
- a ban on the use of luminaires with open flames and metal surfaces,
- no smoking during loading, unloading and handling of dangerous goods,
- The engine must be switched off when handling dangerous goods, unless it is required for the operation of some equipment and apply the parking brake while the transport unit is stationary. [11]

Unless otherwise specified in the ADR, dangerous goods may be carried in in closed vehicles or closed containers, in tarpaulin vehicles or in

tarpaulin containers. This mode of transport is necessary for packaging which is made of moisture-sensitive materials, e.g. cardboard boxes or paper bags. The third option is the transport of goods in uncovered vehicles or containers. Special technical requirements are specified for selecting the appropriate vehicle type. Liability for technical inability of the vehicle is regulated in the CMR Convention Art. 17 par. 3. The carrier may not rely to disclaim his liability or the defects of the vehicle used for transport nor because of the fault or neglect of the person from whom he hired the vehicle or his representatives or staff. [8]

### **CONCLUSION**

The transport of dangerous goods has a special position in transport. Economic and industrial development means that such substances are increasingly transported worldwide. Due to the degree of risk associated with the transport of dangerous goods, this transport is governed by strict legislation. These regulations regulate not only the design of vehicles used for their transport, but also the method of packaging, marking, transport itself and transport documents. The identification of liability for the release of hazardous substances is regulated not only in international conventions but also in national legislation.

The industry is using more and more substances and production processes, which are more aggressive than ever before due to improper handling and non-compliance with the required safety criteria. This increases the risk and extent of the accident. Improper handling of dangerous goods, non-compliance with technological procedures or failure of the human factor are the most common causes of industrial accidents. Therefore, information for the safe production, handling and transport of chemicals and other preparations is important to reduce the consequences of any disaster.

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