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REPORT TITLE: ANALYSIS THE RISK OF TRANSPORTATION
OF HAZARDOUS SUBSTANCES

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I. **INTRODUCTION**

Production and use of chemicals is fundamental to all economies. International trade in chemicals exceeds 1.7 trillion dollars a year for the company.

Chemicals directly or indirectly affect our lives and are an essential part of our food, our health and our way of life. The wide use of chemicals resulted in the development of specific regulations by sectors - transport, production, employment, agriculture, trade and products for consumption, which contain information on hazardous properties and control measures of chemical substances during their read cycle, which will allow the safe management during their manufacture, transport, use and deal with them. Thus will protect human health and the environment.

Harmonization of chemicals management includes systems to inform all those potentially exposed to the risks of chemicals - these groups include workers, consumers, responsible for accidents and the public. It is important to know what chemicals are present or used what hidden hazards to human health and the environment, the method of storage and transportation and how they can be controlled.

Safe storage of dangerous substances and preparations is one of the main tasks of the operators of the businesses on whose territory they are located chemicals and aims to ensure the protection of human life and health and protection of the components of the environment.






Storage of hazardous substance is any method of storage of dangerous substances or preparations before use, handling, processing or shipping them.






1. Hazardous substances, categories, definitions, methods of storage, general storage, risk of storage, protection, purposes, types of storage, labeling, packaging, applications, transportation, safety measures, regulations and others.







1.1. Types of chemicals

Chemicals are classified into one or more categories of danger on the basis of physico-chemical, toxicological and ecotoxicological properties. According to the Law on protection from the harmful effects of chemical substances, preparations and products (Article 2), categories of risk are:

TABLE N 1

Classified	DESIGNATION	
Categories	Danger symbol	R-Phrases
DANGER	DANGER MARK	
1. Explosives	<p>E</p>  <p>Explosive</p>	<p>R2 Risk of explosion with shock, friction, fire or other sources of ignition</p> <p>R3 Increased risk of explosion in shock, friction, fire or other sources of ignition</p>
2. Oxidizing	<p>O</p>  <p>Oxidize</p>	<p>R7 May cause fire</p> <p>R8 Inflammable in contact with combustible materials</p> <p>R9 Explosive when mixed with combustible materials</p>
3. Extremely flammable	<p>F+</p>  <p>Extremely flammable</p>	<p>R12 Extremely flammable</p>
4. Easy flammable	<p>F</p>  <p>Easy flammable</p>	<p>R11 Inflammable</p> <p>R15 In contact with water emit flammable gases very</p> <p>R17 Selfheating in the presence of air</p>
5. Flammable		<p>R10 Flammable</p>
6. Very toxic	<p>T+</p>  <p>Very toxic</p>	<p>R26 Very toxic by inhalation</p> <p>R27 Very toxic by skin contact</p> <p>R28 Very toxic if swallowed</p> <p>R39 Danger of very serious irreversible effects (always associated with R26, 27 and / or 28)</p>
Toxic	<p>T</p>	<p>R23 Toxic by inhalation</p> <p>R24 Toxic in contact with skin</p> <p>R25 Toxic if swallowed</p>

	 <p>Toxic</p>	<p>R39 Danger of very serious irreversible effects (always associated with the R23, 24 and / or 25)</p> <p>R48 Danger of serious damage to health in the long exposure (always associated with the R23, 24 and / or 25)</p>
8. INJURY	<p>Xn</p>  <p>INJURY</p>	<p>R20 Harmful by inhalation</p> <p>R21 Harmful in contact with skin</p> <p>R22 Harmful if swallowed</p> <p>R68 Possible risk of irreversible effects (always associated with the R20, 21 and / or 22)</p> <p>R48 Risk of serious injury to health long exposure (always associated with the R20, 21 and / or 22)</p> <p>R65 Harmful: may cause lung damage if takeover</p>
9. Corrosive	<p>C</p>  <p>Corrosive</p>	<p>R34 It is burning</p> <p>R35 It is serious burns</p>
10. Provocative	<p>Xi</p>  <p>Provocative</p>	<p>R36 Irritating to eyes</p> <p>R37 Irritating to respiratory system</p> <p>R38 Irritating to skin</p> <p>R41 Risk of serious damage to eyes</p>
11. Sensitization (by inhalation)	<p>Xn</p>  <p>INJURY</p>	<p>R42 A sensitization in inhalation</p>
Sensitization (by skin contact)	<p>Xi</p>	<p>R43 A sensitization in skin contact</p>

	 <p>Provocative</p>	
<p>12. Carcinogenic</p> <p>Carcinogenic</p> <p>CATEGORY 1 AND 2</p> <p>Carcinogenic</p> <p>Category 3</p>	<p>T</p>  <p>Toxic</p> <p>Xn</p>  <p>INJURY</p>	<p>R45 May cause cancer</p> <p>R49 May cause cancer by inhalation</p> <p>R40 Existing but insufficient evidence of carcinogenic effect</p>
<p>13. Toxic for reproduction</p> <p>Toxic to reproductive</p> <p>FUNCTION CATEGORY</p> <p>1 AND 2</p> <p>Toxic to the developing</p> <p>organism</p> <p>CATEGORY 1 AND 2</p> <p>Toxic to reproductive</p> <p>FUNCTION CATEGORY</p> <p>3</p> <p>Toxic to the developing</p> <p>organism Category 3</p>	<p>T</p>  <p>Toxic</p> <p>Xn</p>  <p>INJURY</p>	<p>R60 May cause harm reproductive function</p> <p>R61 May cause harm to the fetus in pregnancy</p> <p>R62 Possible risk of impaired reproductive function</p> <p>R63 Possible risk of impaired fetus during pregnancy</p>
<p>14. Mutagenic</p> <p>Mutagenic CATEGORY</p> <p>1 AND 2</p>	<p>T</p>  <p>Toxic</p> <p>Xn</p>	<p>R46 may cause heritable genetic damage</p>

Mutagenic Category 3	INJURY	R68 Possible risk of irreversible effects
15.HAZARDOUS ENVIRONMENT	Ni Dangerous for ENVIRONMENT	R50 Very toxic to aquatic organisms R51 toxic to aquatic organisms R54 Toxic to flora R55 Toxic to fauna R56 Toxic to soil organisms R57 Toxic to bees R58 May cause long-term adverse effects on the environment R59 Dangerous for the ozone layer
		R52 Harmful to aquatic organisms R53 May cause long-term adverse effects in the aquatic environment

1.2 Definitions:

1. **Explosive** - solid, liquid, pasty or gelatinous substances and preparations which may react exothermically without atmospheric oxygen thereby quickly evolving gases, and under certain conditions to shoot, burn heavily or upon heating explode when partially closed;

2. **Oxidizing** - chemicals that give rise to highly exothermic reaction in contact with other substances, particularly flammable substances;

3. **Extremely flammable** - liquid chemicals with extremely low flash point and low boiling temperature and gaseous substances and preparations which are flammable in air at ambient temperature and pressure;

4. **Highly flammable:**

- Substances and preparations which may become hot and to fire in contact with air at normal temperature without any application of energy;
- Substances and preparations which on contact with water or damp air, evolve in dangerous quantities of easily flammable gases;

- Solid substances and preparations which can be easily fire in brief contact with a source of ignition and which continue to burn or smoulder after removal of the source of fire;
- Liquid substances and preparations which have very low flash;

5. **Flammable** - liquid substances and preparations having a low flash point;

6. **Highly toxic** - substances and preparations which in very small amounts when inhaled, swallowed or absorbed through the skin can cause death or acute or chronic damage to health;

7. **Toxic** - substances and preparations which in low quantities when inhaled, swallowed or absorbed through the skin can cause death or acute or chronic damage to health;

8. **Hazardous** - chemicals that when inhaled, swallowed or absorbed through the skin can cause death or acute or chronic damage to health;

9. **Corrosive** - chemicals which, in contact with living tissues, can destroy them;

10. **Irritant** - non-corrosive substances and preparations which, through immediate, prolonged or repeated contact with skin or mucous membranes can cause inflammation;

11. **Sensitizing** - chemicals that when inhaled or when absorbed through the skin, may cause hypersensitivity reactions, so that on further exposure to the substance or preparation characteristic adverse effects;

12. **Carcinogens** - chemicals that when inhaled, swallowed or absorbed through the skin may cause cancer or increase the incidence of cancer;

13. **Toxic to reproduction** - chemicals that when inhaled, swallowed or absorbed through the skin may cause or increase the incidence of non-heritable damage to the progeny and / or damage to male and female reproductive functions or capacity;

14. **Mutagens** - chemicals that when inhaled, swallowed or absorbed through the skin may cause heritable genetic defects or increase their incidence;

15. **Dangerous for the environment** - chemicals which like fall in the environment are or may present immediate or delayed danger for one or more components of the environment.

Where a substance is classified in more than one category of risk in planning security measures should be taken of each of the categories of risk that has a priority category, which represents the main danger in the relevant conditions of the environment.

Chemicals that are not classified as hazardous, including the relevant category according to store inflammable properties (flammable / unflammable).

Taking precautions and tools is a complex task involving a general assessment of the negative impacts of chemicals on not only human health but also on the environment and mineral wealth.

In terms of safety of storage is appropriate dangerous substances and preparations are classified according to their specific properties of the so-called dangerous - storage categories.

In addressing these priority hazardous properties, which require the application of specific measures for protection from fires and explosions: those properties are explosive, highly flammable, highly flammable, combustible or highly inflammable. In addition, storage of hazardous chemicals into account other properties such as: very toxic, toxic and corrosive.

Properties of chemicals, under which are classified as irritant, harmful and dangerous for the environment are not separate categories for joint storage. Chemicals with such properties as well as non-dangerous substances are classified to a category according to store inflammable properties (combustible / non).

1.3 Storage of hazardous substances-principles

Generally storage classes can be used as working tools in storage. This is related both to the storage plan (number and size of storage facilities, sound equipment) and management of the warehouse (storage process).

The classification of a product to a storage class is depending on the available information. Main sources of information are regulations on management of chemicals, the requirements for the transport of dangerous goods, ADR, RID-convention, as well as data from the safety data sheet.

For products labeled as non-hazardous could be used by information product or information based on practical experience.

If the supply of a product does not indicate the information needed to store category, the classification can be made independently in accordance with the following rules or the classification items.

Storage category includes products with similar hazardous properties, which require similar safeguards.

In the classification of products in stock categories are the following rules: each product is classified in one category warehouse in which the classification is done according to the scheme.

This scheme has the following principles:

For explosive, radioactive and infectious substances, it is imperative separate storage. In the scheme, they are ranked by priority.

Substances hazardous physico-chemical properties stand to substances classified as toxic.

Substances, no hazardous properties, ranks last.

You should know that the system of classification does not cover all products.

Produced following sequence:

- o Dangerous infectious substances;
- o Radioactive substances;
- o Explosive substances;
- o Compressed, liquefied and dissolved gases and aerosol dispensers;
- o Self substances;
- o Substances which in contact with water emit flammable gases;
- o Organic peroxide;
- o Oxidizing substances;
- o Flammable solids;
- o Flammable liquid substances;
- o Combustible liquids;
- o Combustible toxic substances;
- o Non-toxic substances;
- o Combustible corrosive substances act;
- o Non-corrosive substances act;
- o Combustible liquids, if they are not flammable substances;
- o Combustible solids;
- o Non-liquids;
- o Non-solids.

1. 4. Risks of storage

Knowing the risks that may arise in the improper storage of hazardous chemicals is an important prerequisite for their reliable storage.

Table № 2 Risks and consequences of improper storage

Event (risk)	Consequences
Fire	<ul style="list-style-type: none"> • -Formation of toxic gases and vapors and subsequent pollution; • - Secondary explosions; • - Contamination of soil, groundwater and surface water from the discharge of contaminated water from fire extinguishing.
Explosion	<ul style="list-style-type: none"> • - Formation of toxic gases and vapors and subsequent pollution of the air; • - Secondary fire; • - Contamination of soil, groundwater and surface water by: <ul style="list-style-type: none"> A) leakage of chemical substances and preparations as a result of the destruction of the entire volume; B) release of contaminated water from fire extinguishing.
Floods	Contamination of soil, groundwater and surface water contaminated by rain water.
Spill (leaks), dispersion of solid and powder chemicals and improper handling and storage of their packaging	Contamination of the components of the environment as a result of the release, spill and dispersion of hazardous chemicals and unregulated disposal of hazardous waste (including packaging torn, dirty dishes, etc.)..

1.5 Objectives of protection

Safe storage of hazardous chemicals and / or products is the responsibility of operators and enterprises associated with the implementation of the preventive principle"- i.e. in the design, construction and operation of warehouses for chemicals should have priority for preventive measures (organizational technical and other measures), which is generally expressed in:

- o Clear distribution of tasks and responsibilities of personnel responsible for the storage of dangerous substances and preparations;
- o Providing periodic training of such personnel;

- o Implementation of procedures for the systematic identification of hazards occurrence of emergency situations and procedures for evaluating the likelihood of their occurrence and evaluation of their consequences;
- o Implementation of monitoring compliance with the procedures and instructions for safe storage of chemicals and maintenance of storage facilities;
- o Take measures to prevent incidents and accidents, including fires, explosions, leakage, spill and dispersion of hazardous substances, etc.;
- o Regular inspection and review of emergency plans;
- o Periodic evaluation of the effectiveness and adequacy of the measures for safe storage;

In the process of design, construction and operation of warehouses for chemicals should be reported and protection purposes.

The main objectives of protection are related to:

- Limiting the smooth distribution of fire and / or explosion;
- Take action under the emergency plan of the company, including activation of early warning systems, warn and inform the workers and potentially affected population and the measures in the localization and limitation of consequences;
- Information services of the Regional Fire and Emergency Safety, including the Municipal Standing Committee for the Protection of the population in disasters, accidents and catastrophes, and power units for the conduct of rescue and urgent emergency-restoration works;
- Ways to ensure access for fire and rescue teams;
- Limiting and / or prohibiting the access of outsiders to the enterprise;
- Prevent contamination of components of the environment.

General principles:

- If possible, hazardous chemicals must be replaced by those which are less dangerous;
- Hazardous chemicals according to their categories of storage should be stored in separate rooms or separate, as should be respected safe distance between them (space separated stock). Other criteria may be separation aggregate states (gaseous, liquid, solid), high corrosives and others;
- Combustible packaging materials must be separated from other materials in storage;
- Under separate storage means storing at least partial storage areas;
- In all cases, hazardous chemicals must be stored separately from food for humans and animals, medicines for human medicine veterinary products, cosmetics;

- Chemicals in the same category of risk may be stored together as far as protective measures in respect of one substance are identical with the protective measures for other substances;
- Substances with different categories of risk may be held together only when protective measures for hazardous substances are appropriate or consistent with those for other substances;
- Each warehouse for hazardous substances should be divided into sections. These sections are formed either by inter-store distances or through walls;
- Storage itself should be separated from other production processes (e.g.: production, packaging, etc.);
- To prevent the risks of incidents and accidents and limiting their consequences, large storage area is organized so that when necessary to provide simultaneous access from both sides.

1.6 Types of stocks

Table № 3 Types of warehouses

Type of storage	Special hazard	Special measures
Warehouse with shelves	<ul style="list-style-type: none"> • - Influence of packaging (wooden pallets, cardboard, foil); • - Separate storage position is not readily available; • - This type of store has chimney action should rapidly expand the fire. 	<ul style="list-style-type: none"> • - Fire installation - very imperative; • - Internal storage transport should be used as adjuvants for extinguishing of fire; • - For storage height over 12 meters (with high storage racks) are the most stringent requirements.
Block storage	<ul style="list-style-type: none"> • - Outbreak of fire in most cases not available; • - Danger of collapse in higher blocks. 	<ul style="list-style-type: none"> • - Formation of partial storage areas in size max. 100 sq.m; • - Minimum distance between blokove 2.5 m; • - Maximum height of the blocks 5-6 meters
Storage tanks (for liquids)	<ul style="list-style-type: none"> • - Possible storage of very large quantities; • - Possible contamination 	<ul style="list-style-type: none"> • - Collection tanks, ; concrete firewall • - Of irrigation tanks (presence of sprinkler systems);

	<p>of water;</p> <ul style="list-style-type: none"> • - Multiple storage tanks in a collection tank; • - Possible fire in the tank; • - Loading stations, distribution stations (pipes, flexible connections, cranes). 	<ul style="list-style-type: none"> • - Cover with foam on the tank; • - Cover assembly baths (concrete firewall) with foam; • - Fire extinguishing system in the area of loading and unloading work; • - Risk assessment, if the quantities to be stored are greater than or equal Annex № 3 of the Law on Environmental Protection.
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Under storage means storing for later use, and transfer to another user. It includes a temporary storage and / or readiness for dispatch, i.e. when the substance stays in the enterprise more than 24 hours or more than one working day.

Storage is not a short-term storage is where:

- Short hazardous substances are stored safely in the amount (needed daily) or substances are part of the work or production process;

- When hazardous substances are stored because of a transport need.

There is a joint storage substance when:

- o Be stored in a room of the building;
- In the open storage are persistent and refractory walls or between the required safety distance (8-10 m);
- Are stored in a common concrete firewall, respectively, which internally can be further divided into sections by the walls of the inner areas are lower than inside the concrete firewall.

In co-storage must comply with safety measures in respect of the most dangerous substances.

Co-storage of toxic substances with other substances is unacceptable when different substances require different means of extinguishing.

1.7 Labeling substance

Labeling - any words, phrases, images and symbols that are placed on the packaging of substances and preparation reflect the presence of potential danger according to classification.

The label of a hazardous substance draws the attention of consumers or those who use the substance to the dangers they may be exposed.

The label also serves to direct attention to other sources of more detailed information regarding the safe use of chemicals.

The label identifies all potential hazards that may occur under normal conditions of transport, storage and use of hazardous chemicals in the form in which they are marketed. Marked hazards can not relate to the final form in which chemical substances and preparations used in practice, e.g. in dilution. The most serious hazards are indicated by symbols. These hazards and risks arising from other dangerous properties of substances and preparations shall be marked with standard risk phrases (R-phrases). Standard safety tips contain instructions for safe handling and storage (S-phrases).

The label must be firmly fixed to one or more surfaces of the package, which is in contact with the substance and was placed so that the text can be read horizontally when it is placed in the normal position before being transported to the substance.

Placing the label of danger signs and other codes on the packages is the responsibility of the shipper or the manufacturer. Transporter may not accept for carriage cargo without marks and names.

Below are presented several standard text warning about the risk associated with the use of hazardous chemical substance or preparation (R-phrases):

Table № 4

R1	Explosive in the dry state.
R6	Explosive or without the presence of air.
R7	May cause fire.
R10	Flammable.
R14	Reacts with heavy water.
R23	Toxic by inhalation.
R28	Highly toxic if swallowed.
R29	In contact with water releases toxic gas.
R35	Cause severe burns.
R36	Irritating to eyes.
R45	May cause cancer.
R52	Harmful to aquatic organisms.
R55	Toxic to fauna.
R56	Toxic to soil organisms.
R68	Possible risk of irreversible effects.
Combined R-phrases	
R14/15	Reacts with heavy water and emit extremely flammable gases.
R21/22	Harmful in contact with skin and if swallowed.
R23/24	Toxic by inhalation and by skin contact.
R26/27/28	Very toxic by inhalation, in contact with skin and if swallowed.
R36/37/38	Irritating to eyes, respiratory system and skin.
R48/23/24/25	Toxic: danger of serious damage to health in long-exposure by inhalation, in

	contact with skin and if swallowed.
R68/20/21/22	Harmful: possible risk of irreversible effects by inhalation, in contact with skin and if swallowed.

Here are some standard texts giving advice on safe storage and use of hazardous chemical substance or preparation (S-phrases)

Table № 5

S1	Be kept under lock and key.
S2	Be kept away from access by children.
S13	Keep away from food and beverages for humans and animals.
S16	Keep away from sources of ignition. Do not smoke.
S24	Avoid contact with skin.
S27	Immediately be off all contaminated clothing.
S29	Do not be released into sewers.
S37	To wear appropriate gloves.
S39	To wear protective equipment for eyes / face.
S46	When ingested to seek immediate medical attention and show packaging or label.
S56	This material and its packaging to be disposed of only in places for the collection of hazardous or special waste.
S61	Do not allow discharge into the environment. See special instructions / safety data sheet.
Combined S-phrases	
S3/9/14/49	Keep only in original container in a cool and well ventilated place away from ... (incompatible materials shall be indicated by the manufacturer).
S20/21	At work should not eat, drink and smoke.
S36/37/39	To wear appropriate protective clothing, gloves and protective equipment for eyes / face.
S47/49	Keep only in original container at temperature not exceeding ... ° C (indicating a manufacturer).

1.8 Packaging

Any manufacturer who marketed a new kind of substances or preparations must be packaged in accordance with the requirements of relevant legislation.

Packaging of hazardous chemicals must meet the following requirements:

- To be constructed in a way that does not allow spillage or dispersal of its contents, except where required special safety devices;
- Fittings for Its closure is made of materials that do not interact with the contents of the package;
- Fittings for its closure must withstand normal loads during transport and work with them;

- Containers with replaceable closure devices to be constructed in a way that allows multiple closure, without scattering or spilling of the content.

Packaging of hazardous chemicals that are marketed for mass use, must meet the following requirements:

1. Each package, regardless of its capacity, which contains hazardous chemicals and is labeled as "very toxic, toxic or corrosive, must be equipped with closure devices that make it inaccessible to children and to have clear marked tactile sign of danger;

2. Each package, regardless of its capacity, which contains hazardous chemicals and is labeled as "harmful, extremely flammable or highly flammable, must be clearly marked tactile sign of danger.

Packages must have:

- o Stamped or printed on the plate permanently affixed by the code numbers or letters giving information about the type of container (drums, safe, bag), materials (metal, wood, plastic), its (type of substance that can be placed in the), the year of manufacture, the manufacturer's initials, initials of established him competent institution or country and others;

- o Inscriptions number of substances in the container and eventually their names, if required for the substance;

Labels of danger, informed of the nature of risk

1.9 Transportation of Dangerous Goods (substances), scope and application, training of persons engaged in the carriage of dangerous goods, safety obligations of the participants (international carriage of dangerous goods by road-ADR)

Transportation - substances banned from international carriage or transportation that is permitted under certain conditions. Each party reserves the right to regulate or prohibit entry into its territory of dangerous goods and for other reasons than those concerning safety during transport.

Unit load transport of dangerous substances in no case may involve more than one trailer (or semi-trailer). Any substance is transported by the relevant documents.

Documents required for transportation of hazardous substances:

- o Transport documents covering all transported hazardous substances and, where appropriate, and the container packing certificate;

- o Written instructions relating to all goods transported;

- o A copy of the basic text of a special agreement if the shipment is based on it.

Where the provisions of ADR require undersigned documents are available, they should also be carried in the transport unit:

- o Certificate of approval of the vehicle;
- o Evidence of training of the driver of the vehicle;
- o Authorization allowing the execution of the transport operation.

Written instructions should be kept in the cab of the driver and are easily recognizable. The carrier must ensure that drivers involved that understand and are able to properly execute these instructions.

All transport vehicles carrying dangerous substances should have placed signs with the signs of danger. Of each transport unit carrying dangerous goods to be signal number 2 neutral orange plates, one front and one back. Moreover orange plates of vehicles are also marked with signs indicating the type of dangerous goods. Hazard signs are placed on both sides and the rear cargo area of vehicle.

Required transport vehicles are equipped with:

- o At least one portable fire extinguisher with a minimum capacity of 2 kilograms of dry powder filler which is suitable for fire suppression in the event of a cabin or the engine, while such as when used for suppression of fire cover load it to deteriorate;
- o In addition to the equipment prescribed above, at least one portable fire extinguisher with a minimum capacity of 6 kilograms of dry powder filler which is suitable for fire fighting occurred in the tires or brakes.

Chemical reagents, which are contained in fire extinguishers, which is equipped vehicle must be such that they are not able to release toxic gases into the driver's cab or under the influence of the heat of fire.

General requirements concerning the training of drivers:

Persons whose duties are related to the transport of dangerous goods must be trained in the requirements for the carriage of such goods appropriate to their responsibilities and obligations. Training must be in a form appropriate for the responsibility of the person. It must be detailed directly to the corresponding duties and responsibilities of the person pursuant to the provisions for the carriage of dangerous goods. When the carriage of dangerous goods includes various modes of transportation, the staff should be aware of the conditions affecting other modes of transportation. In accordance with the degree of risk of injury or exposure to risk arising from an accident in the transport of dangerous goods, including loading and unloading, the staff should receive training covering the risks and dangers that hide dangerous goods. Successfully passed the training courses are issues.

Safety Measures

Participants in the carriage of dangerous goods should take appropriate measures in accordance with the nature and extent of foreseeable dangers to avoid damage or injury and, if necessary, to minimize their consequences. In all cases should be subject to the ADR in the field of action.

Where there is immediate risk of danger to the safety of a wide range of people, the participants shall immediately notify emergency services and must provide the information they requested to take appropriate actions.

Requirements for the shipper of dangerous goods are to submit to only items that meet the requirements of ADR in particular must:

- o Confirmed that dangerous goods are classified and authorized for carriage in accordance with ADR;
- o Provide information and data carrier and, if necessary, the required transport and accompanying documents;
- o Only packages, large packages, packaging medium for transporting bulk tanks and approved and suitable for the transport of these substances and bearing the marks prescribed by ADR;
- o Comply with requirements on how to dispatch and forwarding restrictions;
- o Ensure that even empty uncleaned tanks and undecontaminated or empty vehicles and large and small containers for carriage in bulk are properly marked and labeled, and that empty uncleaned tanks are closed and have the same degree of leak it would have were complete.

Requirements for the carrier - in particular:

- To ensure that dangerous goods to be transported, is authorized for transportation under ADR;
- To ensure that the transport unit is prescribed documentation;
- To verify visually that the vehicles and cargo, no obvious defects, leaks or cracks, missing equipment and etc.;
- To ensure that the next in line for road testing, vehicle battery, removable tanks, portable tanks and tankers, container has not expired;
- To ensure that vehicles are not overloaded;
- To ensure that they are labeled and hazard markings prescribed for the vehicle;
- To ensure that the equipment prescribed in written instructions to the driver in the cab of the vehicle.

Recipient - is obliged not to refuse acceptance of goods without valid reasons and confirmed after the landing, that relating to the ADR requirements are met and in particular:

- To occur in the cases provided by the ADR, it is cleaning vehicles and containers;
- To ensure that once fully unloaded and cleaned, the containers do not carry the danger mark.

Duties of loader:

- It must deliver dangerous goods carrier only if they are authorized for transportation under ADR;
- To verify the integrity of the package upon delivery for the transport of packaged dangerous goods;
- When loading of dangerous goods in a vehicle large or small container to comply with specific requirements for loading and processing;
- Must comply with the load of dangerous goods in the container to meet the requirements for marking of danger
- When loading packages, comply with the prohibitions on mixed loading taking into account the dangerous goods that are already in the vehicle.

Wrapper:

- To comply with the requirements concerning packing conditions, or for mixed packing and
- When preparing packages for shipment requirements, marking and labeling of packages.

Duties of loader:

- To make sure before filling of the tanks that they and their equipment are in satisfactory technical condition;
- To ensure that the period to the next in line for a road test, vehicle battery, replacement tanks, portable tanks, tankers, container has not expired;
- Only to tank with dangerous goods authorized for carriage in those tanks;
- In the filling of tanks to comply with the requirements relating to dangerous goods in the neighboring cells;
- In the filling of tanks to comply with the maximum degree of filling or the maximum weight of contents per liter capacity in terms of substance, which is complete;
- After filling the vat to check the leak sealing devices;
- To ensure that the outside of the vat filled by him, no polepnali hazardous waste substance, which is filled vat;
- In preparation for transporting dangerous goods to ensure that the required orange plates, plates with signs or danger labels are placed in tanks, vehicles and large and small containers for carriage in bulk in accordance with the requirements.

Sample written instructions in the transportation of hazardous CARGO

Dangerous for the environment, liquid

Name of substance (substances): Dodecylphenol

- colored liquid;
- noticeable smell;

Substances:

Cefic Tremcard - Instruction in writing

- unmixed with water in heavy water.

SOURCE OF HAZARD

- Water pollutant;
- threat of bio-cumulative effect;
- may ignite;
- may cause irritation.

FUNDS FOR PERSONAL PROTECTION

- protective safety glasses or face screen;
- protective gloves;
- protective footwear;
- flask to flush eyes with clean water.

Equipment inventory

- shovel;
- broom;
- sand or other substance absorbed;
- or set an appropriate collection spilled substances.

GENERAL driver's actions

- - turn off the engine;
- - no non-isolated lamps. No smoking;
- - be marked with permanent warning road signs and warn other drivers and

passer;

- - keep the public away from danger zone. Stay in the country from which the wind is coming;
- - report immediately to the police and the fire part.

ADDITIONAL AND / OR SPECIAL ACTIONS OF DRIVER

- - any action is permissible only in the absence of risk to life;
- - stop the leakage, if not risky;
- - leaking fluid to reduce or asked to sand, earth or other suitable material;
- - Avoid direct contact with the substance;
- - avoid falling liquid water streams, sewers, basements and excavations;
- - if drainage or sewage pipe is caught is such a substance or overspill of soil or vegetation, inform police.

FIRE (information for the driver in case of fire)

- - Do not attempt off the flame, cover the load.

FIRST AID

- Seek medical treatment if they develop any symptoms appear due to inhalation of or contact with skin or eyes.

MORE INFORMATION ABOUT EMERGENCY SERVICES

- - do not rinse the road with water;
- - insert a pollutant absorber in a safe place.

Only applicable during road Transportation

Besides written instructions for the transportation of hazardous substances, hazardous substance must be accompanied by a safety data sheet of the substance. The supplier gives the substance of the recipient of the substance safety data sheet, drawn up in accordance with relevant legislation.

It is not necessary to provide a safety data sheet where dangerous substances or preparations offered or sold to the public, provided sufficient information allowing consumers to take the necessary measures to protect health, safety and the environment unless it is refined of the downstream user or distributor.

The safety data sheet is provided in the official language of the state (s) State (s) in which the substance is put on the market unless the Member State does not provide otherwise.

Safety data sheet has the date and contain the following obligatory headings:

1. Name of the substance / preparation and company / undertaking;

2. Identification of hazards;
3. Composition / information on ingredients;
4. Arrangements for first aid;
5. Fire measures;
6. Measures in the emergency release;
7. Handling and storage;
8. Exposure Controls / Personal protective equipment;
9. Physical and chemical properties;
10. Stability and reactivity;
11. Toxicological information;
12. Environmental information;
13. Disposal of waste;
14. Information on transport;
15. Information in accordance with current regulations;
16. Other information.

The purpose of the safety data sheet is to provide the user additional information beyond the scope of the labeling information needed to take measures to protect workplace health and safety of people and environmental protection. Below is presented a model with a safety data sheet:

PRISTA OIL	SAFETY DATA SHEET	Issued on: 2008-09-15 Revised edition Supersedes 2005-01-01
	<p>!!! Read SDS before handling and disposing the product</p> <p>MSDS № H 007/5</p> <p>SDS is prepared in accordance with Annex 2 of Regulation (EC) №1907/2006</p> <p>Prista® FD-5</p>	Стр.....
1.PRODUCT AND COMPANY IDENTIFICATION		
<u>Product name</u>	Prista®FD-5	
<u>Product application</u>	Spindle oil	
<u>Company Identification</u>	“Prista Oil ”-EAD – 46 Treti Mart blvd. 7002 Rousse, Phone: + 359 82 82 46 97	
<u>Emergency phone number</u>	+ 359 82 82 46 97, e-mail:information@prista-oil.bg	

2. HAZARDS IDENTIFICATION

Product is classified as dangerous according to the classification rules in Directives 67/548/EEC or 1999/45/EC. Classification: Xn- Harmful with risk phrase R65.

Acute effects of exposure to man

Inhalation

Vapours or mist in unusually high concentrations, as from exposure in poorly ventilated areas, may cause irritation of the nose and throat, headache, nausea and drowsiness.

Skin contact

Brief contact is not irritating. Prolonged and repeated contact with this product may cause allergic skin reaction in sensitive, exposed persons.

Eye contact

May cause minimal irritation, experienced as temporary discomfort.

Ingestion

No adverse effects expected. If more than several mouthfuls are swallowed, abdominal discomfort, nausea and diarrhea may occur. Small amount of liquid aspirated into the respiratory system during ingestion or from vomiting may cause bronchopneumonia or pulmonary edema.

Effect of exposure to the environment

May form an oil film leading to de-oxygenation of water and possible harmful effect on aquatic life.

Product can penetrate soil until reaching the surface of ground water (in the presence of ground water).

3.COMPOSITION/INFORMATION ON INGREDIENTS

<u>Name</u>	<u>% Wt</u>	<u>CAS No. / EINECS</u>	<u>R phrases and</u>
		<u>No.</u>	<u>symbols</u>
Distillates (petroleum) hydrotreated light	< 36.0	64742-47-8/265-149-8	Xn R65, R36/38
Distillates (petroleum), Hydrotreated light naphthenic	<64.0	265-156-6/64742-53-6	None
Long chain alkenyl esters , polysulphide	<0.25	Polymer	R52/53 R52/53
Olefin polysulphide	<0.22	Polymer	C R34, R53
Alkylphosphoric acid ,esters	<0.1	Confidentially	Xi R36/38, N
Obstructed alkylphenol	<0.09	Confidentially	R50/53
Long chain alkenylamine	<0.05	204-015-5	Xn R22,C R35,N
DMSO content (IP 346)	< 3.0		R50

4. FIRST AID MEASURES

Inhalation

If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or symptoms persist.

Skin contact

Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists

Eye contact

Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Ingestion

DO NOT INDUCE VOMITING. Get medical attention. Never give anything by mouth to an unconscious or convulsing person.

Instructions for physicians/doctors

If nausea or irritations do not appear after ingestion, give medical carbon in water slurry (3 tablespoons in one liter water).

5. FIRE-FIGHTING MEASURES

<u>Suitable extinguishing media</u>	Use water fog, dry powder, foam or carbon dioxide. Use water to cool fire-exposed containers. If the leak or spill has not ignited, use water fog to disperse the vapours and to provide protection for personnel attempting to stop the leak.
<u>Extinguishing media which must not be used for safety reasons</u>	Water jet
<u>Special exposure hazards arising from the preparation</u>	None
<u>Special protective equipment for the fire-fighters</u>	The nature of special protective equipment required will depend upon the size of the fire, the degree of confinement of the fire and the natural ventilation available. Fire-resistant clothing and self-contained breathing apparatus is recommended for fires in confined spaces and poorly ventilated areas. Full fireproof clothing is recommended for any large fires involving this product.
<u>Firefighting procedure</u>	In case of fire - Always call the fire brigade. Small fires, such as those capable of being fought with a hand-held extinguisher, can normally be fought by a person who has received instruction on the hazards of flammable liquid fires. Fires that are beyond that stage should only be tackled by people who have received hands-on training. Ensure escape path's available.
6. ACCIDENTAL RELEASE MEASURE	
<u>Personal precautions</u>	Personal Protective Equipment must be worn. Ventilate area if spilled in confined space or other poorly ventilated areas.
<u>Environmental precautions</u>	Prevent entry into sewers and waterways. Pick up free liquid for recycle and/or disposal. Residual liquid can be absorbed on inert material.
<u>Cleaning materials</u>	Sand, sawdust
7. HANDLING AND STORAGE	

<u>Handling</u>	Avoid prolonged or repeated contact with skin. Avoid breathing of vapours
<u>Storage</u>	Keep containers closed when not in use. Store at ambient temperature
<u>Specific use</u>	In accordance with product specification
8. EXPOSURE CONTROL/PERSONAL PROTECTIN	
<u>Exposure Limits</u>	5 mg/m ³ of air for mineral oil mist averaged over an 8 hour daily exposure
<u>Exposure control</u>	
<u>Respiratory protection</u>	Under normal use conditions, respirator is not usually required. If vapor or mist is generated, use approved respirator as appropriate. Certified air respiratory protection should be used for cleaning large spills or upon entry into tanks, vessels, or other confined spaces.
<u>Hand protection</u>	Neoprene gloves; time for wearing out the gloves material >30 minutes.
<u>Eye protection</u>	Safety goggles
<u>Skin protection</u>	Exposed employees should exercise reasonable personal cleanliness. This includes cleansing exposed skin areas several times daily with soap and water and laundering or dry cleaning soiled work clothing. Long sleeve shirt is recommended. Use chemically protective boots when necessary to avoid contaminating shoes. Do not wear rings, watches or similar apparel that could entrap the material and cause a skin reaction.
<u>Environmental exposure controls</u>	May form an oil film leading to de-oxygenation of water and possible harmful effect on aquatic life. Product can penetrate soil until reaching the surface of ground water (in the presence of ground water).
9. PHYSICAL AND CHEMICAL PROPERTIES	
9.1. General information	
Appearance	Clear colourless liquid
Odour	Slight oily odour
9.2. Important health, safety and environmental information	
pH	Not applicable

Boiling point/Boiling range	-
Flammability/ Flashpoint, °C, COC	-
Explosive properties	-
Oxidising properties	-
Vapour pressure	-
Density at 20°C, g/ml	0.849
Solubility	Soluble in organic solvents
Water solubility	Insoluble
Partition coefficient: n-octanol/water	-
Kinematic viscosity ,cSt	5.0 cSt at 40°C
Vapour density	-
Evaporation rate	-
9.3. Other information	
Auto-ignition temperature,°C	220
Flashpoint ,°C, PMCC	130
Surface tension mN/m at 25°C	<33
10. STABILITY AND REACTIVITY	
<u>Conditions to avoid</u>	Material is normally stable at moderately elevated temperatures and pressures
<u>Materials to avoid</u>	Oxidizing agent
<u>Hazardous decomposition products</u>	Smoke, carbon monoxide and other products of incomplete combustion
11. TOXICOLOGICAL INFORMATION	
<u>Eye contact</u>	Not expected to cause eye irritation. Base oil tested in accordance with Method OECD 405. May cause minimal irritation or redness if accidental eye contact occurs.
<u>Skin contact</u>	LD ₅₀ (rabbits) for base oil is > 2000mg/kg - Not expected to be skin irritant Base oil tested in accordance with OECD 404. Prolonged or repeated skin contact as from clothing wetted with material may cause dermatitis.
<u>Inhalation</u>	If material is misted or if vapours are generated from heating, exposure may cause irritation of mucous

	membranes and the upper respiratory tract.
<u>Ingestion</u>	LD ₅₀ (rats) for base oil is > 5000mg/kg- consider very low toxicity. Small amount of liquid aspirated into the respiratory system during ingestion or from vomiting may cause bronchopneumonia or pulmonary edema.
<u>Chronic</u>	Repeated skin contact may cause a persistent irritation or dermatitis.
12. ECOLOGICAL INFORMATION	
<u>Ecotoxicity</u>	LC ₅₀ for base oil (96 hours for fish) is > 1000mg/l EC ₅₀ for base oils (48 hours for Daphnia is > 1000mg/l Very low toxicity
<u>Mobility</u>	Low, due to low water solubility. Spillage may penetrate the soil causing ground water contamination
<u>Persistence and degradability</u>	This product is readily biodegradable, according OECD. This product can degrade rapidly in air.
<u>Bioaccumulative potential</u>	Log K _{ow} for base oils is in range 3.9-6.0. Partition coefficient n-octanol/water. A value Log K _{ow} > 3.0 indicates possible bioaccumulation.
<u>Other adverse effects</u>	May form an oil film leading to deoxygenation of water and possible harmful effect on aquatic life.
13. DISPOSAL CONSIDERATIONS	
<u>Disposal of preparation and contaminated packaging</u>	Always change used oils only at authorized places. Dispose empty lubricant containers at approved for such wastes places. Follow all state or local regulations and requirements for disposal, recycle or reclaiming of waste oils and petroleum products.
<u>Waste code</u>	13 01 10* (In accordance with European Waste Catalogue)
14. TRANSPORT INFORMATION	
	ADR - Not regulated IMDG - Not regulated RID - Not regulated IATA - Not regulated

15. REGULATORY INFORMATION

Classification/ Labeling

Under the criteria of Directives 67/548/EEC or 1999/45/EC special labeling is required. This product is classified as:

Xn – Harmful with the following risk and safety phrases:

R65- Harmful: may cause lung damage if swallowed

S23- Do not breathe vapour

S62- If swallowed, do not induce vomiting. Seek medical advice immediately and show this container or label.

Contains Distillates (petroleum) hydrotreated light.

16. OTHER INFORMATION

Revised edition

Revised edition

Changes indication

ITEM

DATE

12.Ecological information 01-01-2005

13.Disposal consideration 01-01-2005

3. Hazard identification 15-12-2005

4. First aid measure 15-12-2005

5. Fire-fighting measure 15-12-2005

Revised edition according 15-09-2008

Regulation (EC) 1907/2006

Full text of R phrases

R22- Harmful if swallowed

R34- Causes burns

R35- Causes severe burns

R50- Very toxic to aquatic organisms

R53- May cause long-term adverse effects to the aquatic environment

R65- Harmful: may cause lung damage if swallowed

R36/38- Irritating to eyes and skin

R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects to the aquatic environment

R52/53- Harmful to aquatic organisms, may cause long-term adverse effects to the aquatic environment

Literary reference

This Safety Data Sheet is prepared in accordance with Annex II of Regulation 1907/2006 (EC)

67/548/ EEC (dangerous substances)

1999/45/EEC (dangerous preparation):

2001/58/EEC

EUCLID Data Sheet for base oil – European commission-European Chemical Bureau

This information is the best of our current knowledge, and is believed to be correct as of the date hereof, and is intended to describe the product only in terms of health and safety and environmental requirements. Since the conditions of use are outside our control, any recommendations and suggestions are made without guarantee

1.10. Precautions and regulations

Precautions to prevent the occurrence of accidents and dangers in loading, unloading and transport of dangerous goods depend on the nature of the substance and nature of hazard.

Provisions for the transport of all substances are:

- o compliance to the packaging and on the packaging specified for each substance;
- o compliance with the requirements for construction, technical equipment and the serviceability of the brakes, tires, lights, etc.;
- o marking of packages and alert the vehicle transported according to substance;
- o availability of written instructions required by the personal protective equipment for the driver;
- o compliance with the prohibition of mixed or co-packing loading, unloading and transport of certain substances;
- o continuous surveillance of the vehicle with hazardous substances;
- o compliance with the prohibition of smoking, open fire, the carriage of passengers;
- o observance of the maximum levels of certain goods that can be transported by a vehicle;
- o compliance with the provisions for the transport of substances of different classes (such as a carriage requirement for "full load" (direct only one substance in a quantity of ADR, which has only one sender and one receiver and can be unloaded or goods only station with no loading or unloading other goods and congestion in another vehicle), vehicle type or package, a requirement to control the temperature in the cargo area during transport, etc.).

II. Classification of Risk

Classification is an initial point of connection with risk. It includes risk identification (risk) of the substance or mixture by determining the category of risk, using certain criteria.

Term "hazard classification" is used to denote only recorded material and hazardous properties of substances and mixtures, and this process involves three steps:

- Identification of relevant data relating to the risks of the substance or mixture;
- Subsequent review of those data to identify the risks associated with the risks of the substance or mixture;
- Decision on whether the substance or mixture will be classified as hazardous substances or mixtures and the degree of danger and, if necessary by comparing the data in accordance with accepted criteria for the classification of risk.

Thus, the information represents a harmonized definition of the classification of risk that can be applied to all categories of risks in the system.

2.1 Types of risks

The risks are:

- o Physical;
- o Health;
- o Environmental risk.

Physical risk - provides specific guidance (recommendations) to approve the methods of investigation and criteria for classification. Criteria for physical risk applicable to mixtures. Roger was mixtures to be tested for physical risk.

Generally, the criteria for physical hazards are quantitative or semi with multiple levels of risk and with different performance.

Types of physical risks - description

Physical risks are:

- o Explosives;
- o Flammable gases;
- o Flammable aerosols;
- o Corrosive gases;
- o Gases under pressure;
- o Flammable liquids;
- o Flammable solids;
- o Autoreactive substances;
- o Piroforni liquids;
- o Piroforni solids;
- o Selfheating substances;
- o Substances which in contact with water emit flammable gases;
- o Corrosive liquids;
- o Oxidizing solids;
- o Organic peroxides;
- o Corrosive to metals.

Explosives

An explosive substance (or mixture) is solid or liquid, which in itself is capable by chemical reaction to form a gas with temperature and pressure and such speed as to cause injury surround environment. Included are pyrotechnic substances even when they do not emit gases. Pyrotechnic substance (or mixture) is constructed in such a way as to cause an effect by heat, light, sound, gas or smoke or a combination of all these effects as a result of chemical reactions is self.

There are 6 categories in explosives characteristics:

- o Risk of mass explosion;
- o Risk of disposal;
- o Risk of fire or a small risk of disposal;

- o There is no significant risk;
- o Many non-sensitive substances with the risk of mass explosion;
- o Final non-sensitive particles are not at risk of mass explosion.

Substances, mixtures and particles are assigned to one of six categories depending on the type of risks they present. Usually only in the transport sector, six categories are used for explosives.

Flammable gases

Flammable gas is gas that is ignites in contact with air at 20 ° C and standard pressure 101.3 kPa. Substances and mixtures of this class of risk is considered to one of two categories of risk based on results obtained from research or computational methods.

Flammable aerosols

Aerosols are compressed gas, liquefied or dissolved under pressure in the tank disposable, made of metal, glass or plastic, with or without liquid, paste or powder.

Oxidizing gases

Oxidizing gas means any gas that may normally in the presence of oxygen, can cause or contribute to ignition of other materials more than air. Substances or mixtures of this hazard are placed in a separate category hazard on the basis that in the presence of oxygen they cause or contribute to ignition of other materials more than air. Certain information systems risk include oxidizing substances (liquids, solids and gases) as a separate class of chemicals.

Gas pressure

Gases under pressure are gases which are contained in the reservoir at a pressure not less than 280 Pa at 20 ° C or cooling fluid. It covered four types of gases or gas mixtures to address the effects of sudden release of pressure or freezing which may cause serious danger to people, properties or other hazards that may cause risks to the environment. Gases are classified according to their physical condition when placed in one of four groups:

Group	Criteria
Compressed gases	Completely gaseous at a temperature of - 50 ° C
Liquefied gas	Partially liquefied at a temperature > - 50 ° C
Cooling liquefied gases	Partly because of its liquefied low temperature
Dissolved gases	Dissolved in the solvent in liquid phase

Flammable liquids

Flammable liquid means a liquid having a combustion temperature no higher than 93 ° C. Substances or mixtures of this risk group refer to one of four risk groups based on the point of combustion and melting point.

Category	Criteria
1.	Flash point <23 ° C (73 ° F) and initial temperature of boiling

	<35 ° C (95 ° F)
2.	Flash point <23 ° C (73 ° F) and initial temperature of boiling > 35 ° C (95 ° F)
3.	Flash point> 23 ° C (73 ° F) and initial temperature of boiling <60 ° C (140 ° F)
4.	Flash point> 60 ° C (140 ° F) and initial temperature of boiling <93 ° C (200 ° F)

Flammable solids

Flammable solids are solids that are easily combustible and can cause or contribute to fire through friction. Easily combustible solids are powder, granulated or pasty substances which are hazardous if they are flammable in contact with a source of combustion as is the burning match and if the flame spreads rapidly.

Substances and mixtures of this class of risk is considered to one of the following risk categories:

Category	Criteria
1.	Metal powder: Burning time <5 minutes Other: wet area does not stop the fire Burning time <45 seconds or burning rate> 2.2 millimeters / sec
2.	Metal powder: Burning time> 5 and <10 min Other: wet zone stops the fire for at least 4 min Burning time <45 seconds or burning rate> 2.2 millimeters / sec

Reactive substances

Reactive substances are thermally unstable liquids or solids that contribute to the running of the highly exothermic decomposition even without participation of oxygen (air). Substances or mixtures of this class of risk is considered to one of 7 types A to G. Nowadays only the transport sector uses seven categories reactive substances presented in the following table:

Table № 6

Type	Criteria
A	Capable of igniting and burning rapidly, in package
B	Possess explosive properties as a package which is not flammable and does not burn quickly, but they are due to the flow of thermal explosion in this package
C	Possess explosive properties when the substance or mixture as a package can not fire or burn quickly and cause thermal explosion

D	<ul style="list-style-type: none"> • Fire is in part not burn quickly and do not show strong effects when heat or limited • Does not fire, burn slowly and do not show strong effects in organic or heating • Does not fire and not burn and show intermediate effects in organic heat.
E	Does not fire or burn and show weak or no effects in organic heat
F	Not flammable in cellular concrete state or incinerated and only low or no show effects when heat limited as much as at low or no explosive power
G	Not flammable in cellular concrete condition and does not burn and do not show effects in organic explosive or heat energy, means it is relatively stable (increasingly rapid decomposition temperature is 60 to 75 ° C for 50 kilograms package) and liquid mixtures to reduce Sensitivity is used diluent at a temperature below 150 ° C.

Pirophoric substances - liquids and solids

Pirophoric fluid is a liquid, which even in small quantities due ignition within 5 minutes after contact with air. Substances and mixtures of this hazard class are placed in a separate category.

Pirophoric solid is solid, which is responsible, even in small quantities for ignition within 5 minutes after contact with air. Substances and mixtures of this hazard class are placed in a separate category.

Selfheating substances

Selfheating matter is solid or liquid other than pirofor substance which by reaction with air and without energy is responsible for selfheating. Differs from pirofor substance in that it will fire only if in large quantities (kilograms) and after a long period of time (days and hours).

Substances which in contact with water emit flammable gases

Substances which in contact with water emit flammable gases are solids or liquids, which in interaction with water are responsible for the occurrence of spontaneous ignition or release of flammable gases in dangerous quantities.

Oxidizing liquids

Oxidizing fluid is a liquid, which in itself is not necessary to be flammable, may generally by giving oxygen to cause or contribute to combustion of other substances.

Oxidizing solids

Strongly oxidizing substance is a substance which in itself is not necessary to be flammable, but usually by giving oxygen cause, or contribute to combustion of other substances.

Organic peroxides

Organic peroxide is a liquid or solid organic substance which contains the bivalent -O-O- structure and may be considered cat derivative of hydrogen peroxide where one or two hydrogen atoms are replaced by organic radicals.

Substances and mixtures of this hazard class are placed in one of 7 types A to G. Usually, only the transport sector uses seven categories of organic peroxides.

Table № 7

Type	Criteria
A	Capable of igniting and burning rapidly, in package
B	Possess explosive properties as a package which is not flammable and does not burn quickly, but they are due to the flow of thermal explosion in this package
C	Possess explosive properties when the substance or mixture as a package can not fire or burn quickly and cause thermal explosion
D	<ul style="list-style-type: none"> • Fire is in part not burn quickly and do not indicate strong heating effects in organic • Does not fire, burn slowly and do not exhibit strong heating effects in organic • Does not fire or burn and show effects in organic medium heat.
E	Does not fire or burn and show weak or no effects in organic heat
F	Not flammable or incinerated and only weak or no effects in organic heat
G	Not flammable in cellular concrete state or burn and do not show effects in organic heat nor any explosive power, meaning it is relatively stable (only increasingly rapid decomposition temperature is 60 to 75 ° C for 50 kilograms package) and liquid mixtures with diluent boiling point not lower than 150 ° C was used to reduce sensitivity.

Substances corrosive to metals

Substance or mixture by the chemical reaction that can damage or even destroy the metal is called "corrosive to metals.

2.2 Health risks

Types:

- o Acute toxicity;
- o Irritated skin;
- o Serious impairment of vision;
- o Respiratory or skin sensitivity;
- o Mutagenicity of germ cells;
- o Carcinogenicity;
- o Systematic toxicity of the organs and systems - single exposure;
- o Systematic toxicity of the organs and systems - multiple exposure.

Acute toxicity

Five categories are included in the scheme for acute toxicity, which can select appropriate elements for transportation, consumer, worker and environmental protection. Substances have been one of the five categories of toxicity: oral, dermal, gas money, and dust and fog.

Acute toxicity	Category № 1	Category № 2	Category № 3	Category № 4	Category № 5
Oral	<5	5 <50	> 50 <300	> 300 <2000	Criteria: - Estimated oral concentration
Dermal	<50	> 50 <200	> 200 <1000	> 1000 <2000	- Indication of significant effect in humans
Gases	<100	> 100 <500	> 500 <2500	> 2500 <5000	- No mortality in class 4
Money	<0.5	> 0.5 <2.0	> 2.0 <10	> 10 <20	- Data from other studies
Powder and Fog	<0.05	> 0.05 <0.5	> 0.5 <1.0	> 1.0 <5	

Category № 1 is the most toxic category, has cut rates, usually used mainly in the transport sector for the classification of packing groups. Some competent authorities at the discretion may decide to combine categories 1 and 2 acute toxicity. Category 5 is for chemicals which have relatively low acute toxicity but which under certain circumstances may cause a risk of vulnerable populations.

Skin irritation

Skin irritation means causing irreversible damage to the skin due to application of the substance studied for more than 4 hours. Substances and mixtures of this hazard class are placed in a single category for harmonized corrosion. The competent authorities as transport packing companies in the corrosive category includes three subcategories.

Skin corrosion category 1 - dermal tissue destruction: visible necrosis in one animal;

Skin corrosion Category 2 - irreversible adverse effects in dermal tissue;

Soft skin corrosion - irreversible adverse effects in dermal tissue.

Skin irritation

Skin irritation means the formation of irreversible damage to the skin due to application of the substance studied for more than 4 hours.

Ocular effects

Severe eye irritation means the production of damaged tissue in the eye or physical degradation of vision after application of the study substance to the front surface of the eye, which is not completely irreversible for 21 days of application.

Sensitization

Respiratory sensibilizator means a substance which induces high sensitivity in air-drip time, because inhalation of the substance. Substances and mixtures of this hazard class are placed in a risk category.

Mutagenicity

Mutagen agent means that an increase in the presence of mutations in populations of cells and / or organisms.

Tumorigenicity

Means a chemical carcinogen or a mixture of chemicals that cause cancer or increase its effects. Two risk categories:

Category 1-A or suspected carcinogen

- o Subcategory 1 A known carcinogen in humans based on human evidence;
- o Sub-Estimated 1 carcinogen to humans based on the proven carcinogenicity in animals.

Category 2 carcinogen Chance - Limited evidence of carcinogenicity in humans and animals.

Reproductive toxicity

Effects on reproductive ability or capacity and the effects on development issues for a separate reproductive toxicology. Substances that cause concern for the health of natural foods children have a separate category, or through effects on lactation.

2.3. Risks to environment

Types:

- o Hazard to the aquatic environment;
- o Acute aquatic toxicity;
- o Chronic aquatic toxicity;
- o Bio-accumulative potential;
- o Fast degradability.

Risk to the aquatic environment

Discussed are relevant harmonized criteria for packaged goods and supply and use the multi-modal transport schemes. Elements of them may be used for massive land mass and sea according to the International Convention for the Prevention of Pollution from Ships, insofar as it concerns the aquatic toxicity.

- o **Acute aquatic toxicity**

Acute aquatic toxicity means the property of the substance, causing damage to the water body in a short exposure. Some regulatory systems for these categories of acute aquatic toxicity can be subdivided or expanded to certain sectors.

- o **Chronic aquatic toxicity**

Chronic aquatic toxicity means potential or actual properties of the substance causing adverse effects to aquatic organisms during exposures which are determined in relation to the life cycle of the organism.

III. European legislation on environmental protection and transport

Legislative framework of harmonization of the Bulgarian legislation on dangerous substances is given by the Law on Protection from the harmful effects of chemical substances, preparations and products (SG. 10/2002g. With effect from 04.02.2002g.). Resulting from this law regulation legal acts transposing the requirements of following directives and regulations:

EU legislation - directives and regulations	Bulgarian regulations
67/548/ES Directive on classification, packaging and labeling of dangerous substances Directive 99/45/ES Directive 91/155/ES	Ordinance for the order and manner of classification, packaging and labeling of existing and new chemical substances, preparations and products
67/548/ES Directive on classification, packaging and labeling of dangerous substances	Ordinance for the order and manner of notification of new chemicals
93/67/EES directive establishing the principles of risk assessment for humans and the environment for substances notified under Directive 67/548/ES	Ordinance on final risk assessment for humans and the environment from new substances
76/769/ES Directive on restrictions on marketing and use of certain dangerous substances and preparations	Regulation of hazardous chemical substances, preparations and products subject to prohibition or restriction on the trade and use
2455/92/ES regulation on import and export of certain chemicals	Regulation on procedures and how to import and export of hazardous chemical substances, preparations and products in Bulgaria

Acute aquatic toxicity means the property of the substance, causing damage to the water body in a short exposure. In some regulatory systems for these categories of acute aquatic toxicity can be subdivided or expanded to certain sectors.

IV. Equipment applied for protection (personal protective equipment)

Information on personal protective equipment is required for transport of hazardous substances have been down in a safety data sheet and instructions for carrying cargo. For each type transported, stored and stowed hazardous substance apply various means of individual protection on the basis of physico-chemical and toxicological properties. Must be used:

- o Work clothing;
- Protective gloves;

Snug protective glasses;

In some cases, and respiratory masks.

V. Conclusion

Any undertaking engaged in the carriage of dangerous goods and / or loading and unloading of dangerous substances should have safety advisers for the transport of dangerous goods / substances. Consultant must be licensed person with appropriate qualifications to carry out the activity. It can be external or subcontractor employee in the company.

Safety advisers help to prevent and avoid the risks and dangers involved in transporting, loading and unloading of dangerous goods. Ensure compliance with the requirements specified in the safety data sheets for each type of hazardous substance and the information specified in the instructions for carrying cargo.

The role of safety consultant is to:

- o monitoring compliance with the requirements for the carriage of the dangerous goods;
- o advise employees of the company in activities related to transport of dangerous goods;
- o prepare an annual report to the Head of the enterprise on the activities of the undertaking in respect of the carriage of dangerous goods.

In pursuance of their duties the consultant also:

- monitor the implementation of procedures for the ADR, regulating the identification of dangerous goods transported;
- the acquisition of vehicles for the transport of dangerous goods control whether they meet the requirements of ADR for the carriage of dangerous goods;
- check equipment according to the requirements of ADR, used in connection with the shipment, loading and unloading of dangerous goods;
- organize training of personnel involved in the transport of dangerous goods in the establishment and maintenance of accounts for such training;
- proposes the implementation of emergency plans in case of accident or incident that may affect safety during transport, loading or unloading of dangerous goods;
- investigate any accidents, incidents or serious breaches relating to the carriage of dangerous goods, and prepare reports on them;
- proposes measures to avoid recurrence of an accident, incident or serious misconduct;

- ensure compliance with the requirements relating to the carriage of dangerous goods to the selection and use of subcontractors;
- ensure the availability of detailed work instructions or instructions of the officials dealing with transport, loading or unloading of dangerous goods;
- proposes measures to increase awareness of the risks inherent in the transportation, loading or unloading of dangerous goods;
- check for the presence in the vehicle documents and safety equipment which must accompany the freight, as well as compliance with the relevant provisions in respect of those documents and equipment;
- ensure compliance with the requirements of ADR for the loading or unloading of dangerous goods;
- depending on the degree of danger, in his discretion, inform the regional office of fire safety and emergency type of dangerous goods, movement time and places for recreation;
- if necessary, provides convoy of fire insurance or car during loading, transport or unloading of dangerous goods.

VI. References:

1. Law on Protection from the harmful effects of chemical substances and preparations (SG. 10/2000g. Amend. And supplemented. Pc. 110/2008g.)
2. Guide for global harmonized system for classification and labeling of chemicals, MEW;
3. Guide for storage of chemicals, MEW;
4. Technical guidance on the application of the law of hazardous chemicals, MoEW Sofia
5. Regulation on the procedures and manner of classification, packaging and labeling of chemicals (SG. 5/2003g. Amend. Pc. 51/2008g.)
6. European Agreement concerning the International Carriage of Dangerous Goods by Road (State Gazette. 73/2005g.).
7. Carriage of dangerous goods, Bulgarian Transport Publishing House - Sofia, January 2006.
8. Dangerous substances and preparations, Sofia 2007, Ministry of Health.
9. www.moew.government.bg/
10. www.chemicals.moew.government.bg/chemical/site