

Transportation of dangerous goods

Module 4

Transport of dangerous goods

- UN Model Regulation: UN Recommendations on the Transport of Dangerous Goods.
 - List of UN numbers:
https://en.wikipedia.org/wiki/Category:Lists_of_UN_numbers
- The Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR).
- In Finland, the Act on Transport of Dangerous Goods (719/1994 and amendments).
- For transporting substances, a UN number and ADR class number are required.
 - From the viewpoint of the hazardous waste treatment plant, the ADR agreement is a better starting point than the CLP regulation.

Transport of dangerous goods: labelling of packages (1/4)

- In the ADR agreement, the 9 hazard classes (divided into divisions or categories) of dangerous goods are:
- Class 1 – Explosive substances or articles.
- Class 2 – Gases.
 - Category 2.1 – Flammable gases.
 - Category 2.2 - Non-flammable, non-toxic gases.
 - Category 2.3 - Toxic gases.
- Class 3 - Flammable liquids.

Transport of dangerous goods: labelling of packages (2/4)

- Class 4.1 - Flammable solids, self-reactive substances, polymerizing substances and solid desensitized explosives.
- Class 4.2 - Substances liable to spontaneous combustion.
- Class 4.3 - Substances which, in contact with water emit flammable gases.

- Class 5.1 - Oxidizing substances.
- Class 5.2 - Organic peroxides.

- Class 6.1 - Toxic substances.
- Class 6.2 - Infectious substances

Transport of dangerous goods: labelling of packages (3/4)

- Class 7 - Radioactive material.
 - Category I (in the package label: 7, RADIOACTIVE I).
 - Category II (in the package label: 7, RADIOACTIVE II).
 - Category III (in the package label: 7, RADIOACTIVE III).
 - Category "Fissile material" (in the package label: 7, FISSILE).
- Class 8 - Corrosive substances.
- Class 9 (9A) - Miscellaneous dangerous substances and articles, including environmentally hazardous substances.

Transport of dangerous goods: labelling of packages (4/4)

- The numbers in the dangerous goods labels are the same as the dangerous goods classes (the label colors vary).



Transport of dangerous goods: packaging groups

- Dangerous goods are assigned to three packing groups (also known as UN packing groups), excluding gases (class 1), radioactive substances (class 7) and explosives (class 1).
 - Packing group I: high danger. (PG I)
 - Packing group II: medium danger. (PG II)
 - Packing group III: low danger. (PG III)
- All the goods to be transported are marked with the UN number, and hazard class. ADR class number and packing group when applicable.
- For example, concentrated nitric acid: UN 2031, ADR 8 (5.1), II.
 - This is also in the SDS.
 - The number in the parentheses is subsidiary i.e. the hazard class 8 takes precedence in this case.

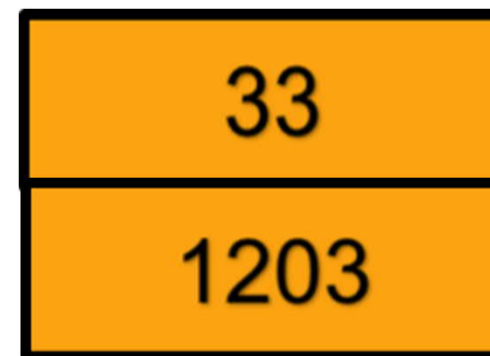
Transport of dangerous goods: packages

- In the ADR agreement, there are rules to packaging and testing packages.
- The packaging must be encoded, and the code consists of, among other things, information about the kind of packaging (e.g. drum), the nature of the material (e.g. steel), the year during which the packaging was manufactured etc.
 - An example of possible code for a steel drum to contain liquids: 1A1/Y1.4/150/98NL/VL824
- Example of a chemical package
 - UN3129: Water-reactive liquid, corrosive, n.o.s. PG I



Transport of dangerous goods: placarding of vehicles

- Transport units (vehicles) carrying dangerous goods must display two rectangular orange-colored plates.
- The upper plate contains the hazard identification number and the lower plate the UN number.
 - The hazard identification numbers in the vehicle plates differ from the numbers in the package labels.
 - In the plates for example, number 33 means highly flammable liquid.



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