

Risk Assessment – Dangerous Goods

Aspects of the risk assessment

Facts, analysis and prevention measures

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ADR / DGR-Regulations: From chaos to order?

- Purpose of ADR / DGR-Regulations:
Ensure transport safety, avoiding accidents!
- Unfortunately, these clear objectives seriously contrast with a baulky readability and a tough understanding!

To make things worse, there are changes in ADR-regulations every two years! And, even more, there is little **knowledge and acceptance** of **highly sensitive intersections** with other regulations, e.g. safety and health of employees, toxicological and ecotoxicological standards as well as packaging and storage regulations!

What is (dangerous goods) RISK?

$$\mathbf{R} \text{ (RISK)} = \mathbf{D} \times \mathbf{P} \times \mathbf{S}$$

D objectifiable measure of possible damage: What can happen?

- Consciousness is missing!
- RESPECT is missing!
- Evident basic rule: no risk = no danger!

P probability: What is the chance for it to happen?

- Factors: time pressure and economic / monetary interests
- Subjective assessment

S Severity of the event:

Depends on all factors of an event, is the component most difficult to estimate, in most of the cases this factor is underestimated!!

Principles of prevention: (as e.g. seen in § 7 of Austrian Workers Protection Act (ASchG)!

RISK: Avoidance!

D, P, S: Minimization of each factor!

Regulations in dangerous goods law are a mixture of:

- technical regulations and
- organizational (partly very complex) regulations!

Chapter 1.3: the disremembered chapter of ADR!

- Assessment of unavoidable risks!
- Starting at the source of risk
- Taken into mind the human factor
- Consideration of the work processes and the work organization
- State of the art: is being widely ignored! Reason: **Expensive! Intentionally not implemented!?**

Electrostatic problems regarding plastic containers:

- The ADR: Regulations with sufficient technical regulations?
- An example of necessary technical innovations in dangerous goods law: **demand for conductive plastic packaging!**
- For the transport process: irrelevant per se, for the filler / consumer = recipient, a (mostly unrecognized) problem!
- Technical result: very intense charging phenomena! (up to 15 KV) in plastic containers! In-house, when filling plastic containers up from 3 litres volume and more, electrostatics / conductivity can occur!
- Demanded by the Austrian regulation (VbF), § 20: containers of 60 litres or more have to be conductive!
- The **TOTAL QUALITY of the container has to fulfill the highest demanded standard – including electrostatic conductivity.**
ADR regulations for conductive plastic containers starting from 1000 liters (= IBC)!

Danger of mistake within hazardous goods class 8: acids / bases!

- Same GHS label and danger label 8!
- For storage: Provisions for separation in the Austrian safety and health regulations at work – (AAV § 65(8)) - where is the transport correspondence?
- Example “railway”: Identification through the most outstanding factor, the pH value, did not happen at the point of delivery!
Track level at wagon marking: similarity in colour and shape
- At dome cover connections on the wagon: These labels are no longer visible on the top of the dome! Optical perspective! At the top of the connecting bridge, the license plates can't be seen!
- Good practice solution in Germany: **markings on the dome cover**, related to the substance

Practical solution?!

Colour coding of the "danger label" by "mixing" ADR and DIN 2403!



and/or



additional colour / or better: apply additional marking:

RAL4008



BASE

RAL 2010



ACID

Cleaning process in confined spaces: Can be a deadly trap!

- Closely connected to safety and health at work regulations!
- Very often: Working in confined spaces (§ § 59/60 AAV, Allg. Arbeitnehmerschutzverordnung)
- Clearance measurement! Oxygen measurement! – Explosion protection! Lack of oxygen and presence of explosive atmospheres due to combustible residues!
- Fumigation of containers not only with inert gas! – Proper opening of the doors!
- Lacking toxic fumigants labelling of overseas containers!

Protection of Employees – How to achieve this most intended goal?

- Be precise in reading the ADR-regulations!
- Translate complicated issues in general terms of everyday life, use comprehensible pictures
- Permanent teaching and training – Are you kidding? But there´s no other way!

Clear consequences in case of negative behaviour!

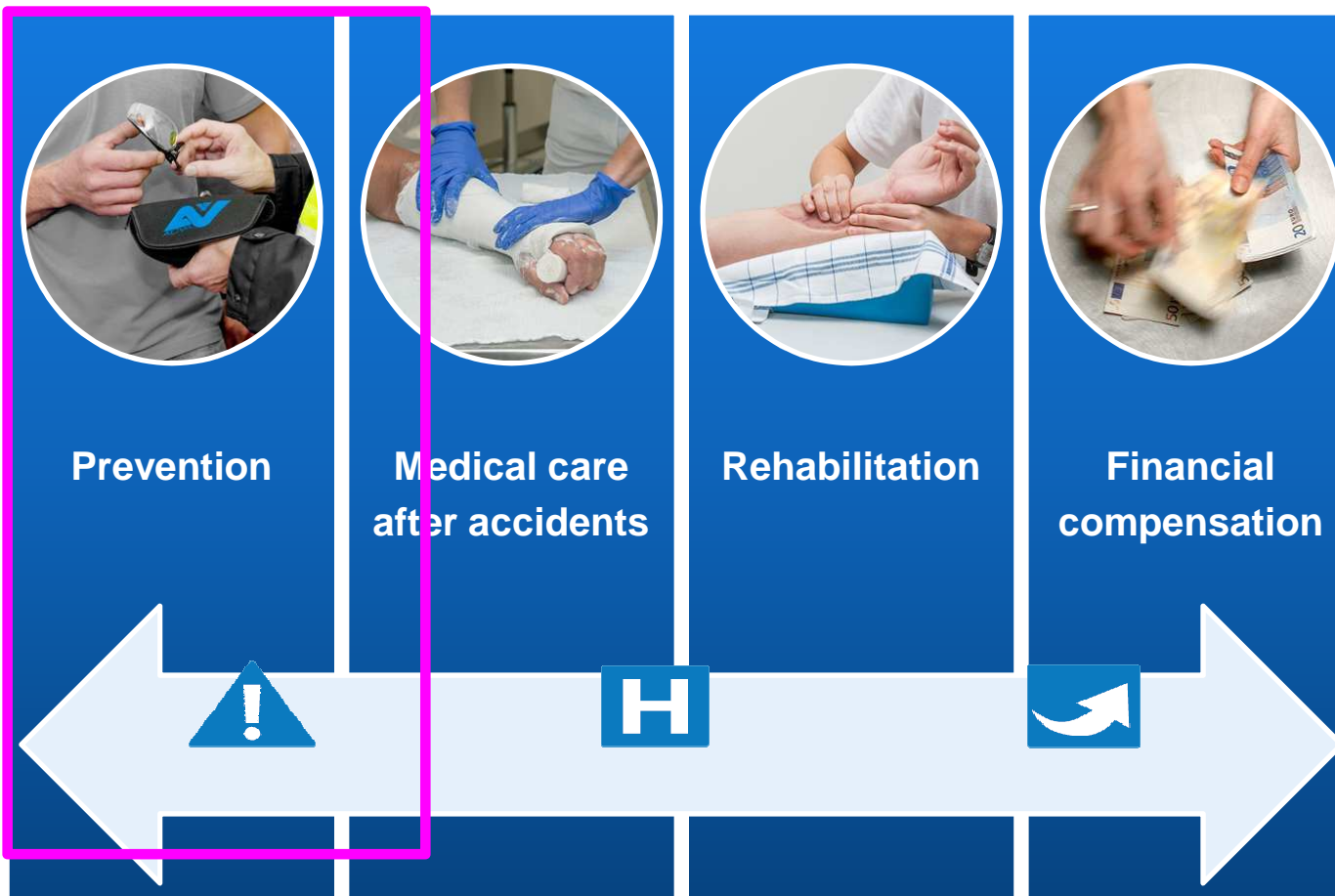
Guideline for the application of regulations regarding the handling of chemicals

- Getting information: The Safety Data Sheet – (M)SDS, especially the H- and P-Instructions and sector 14.
- adhere to the basic rules of truckload.
- do not teach single issues, but the interaction of physical and chemical properties.
- Time: An important factor of success! How can you guarantee maximum safety without having time for it?
- The most important point: Are all the involved well prepared and trained for an efficient long-term communication and coordination?

Core Areas of AUVA

EVERYTHING YOU NEED IN ONE PLACE

- ⚠ Prevention
- 🏥 Treatment after accidents
- 🔄 Rehabilitation
- 💰 Financial compensation



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AUVA-Expert for chemistry according to § 187 ASVG
A sworn and court-certified expert in:
Dangerous Goods - Technical Accident –
Chemical Storage - Protection of employees

- Doctor's degree in Chemical Engineering / Process Engineering, Vienna University of Technology
- AUVA-expert on dangerous goods and evaluation
- visiting lecturer of WIFI NÖ und BFI NÖ
- state-authorized trainer for the training of dangerous goods officers within the framework of the Austrian GGBG
- examiner of the Federal Ministry of Transport, Innovation and Technology - BM VIT.
- quality manager and auditor according to ISO 9001.
- **generally sworn and judicially certified expert for the following subjects:**
 - 09.40 Technical accident and occupational safety
 - 17.65 Traffic: Road transport (dangerous goods transport)
 - 51.10 Trade in chemicals (storage and transport / dangerous goods)