

Active storage of flammable liquids in safety storage cabinets

– Explosion protection in practice



Practical tips for
your risk assessment
for active storage



250:2ml
1000C

CONTENTS

1	1. Identifying hazardous materials and handling them correctly	4
2	2. Safe storage of flammable liquids in work areas	5
3	3. Flammable liquids – classification, labelling and safety parameters	6
4	4. Three types of storage for flammable liquids	8
5	5. Safety requirements for safety storage cabinets	8
	5.1 ... according to EN 14470-1	8
	5.2 Joint storage in safety storage cabinets	9
6	6. Assessment of explosion risk, occupational exposure limits and definition	10
	6.1 Systematic approach to evaluating the explosion risk	10
	6.2 Safety storage cabinets with technical ventilation	12
	6.3 Safety storage cabinets without technical ventilation	13
	6.4 Zone classification in or on safety storage cabinets	14
	6.5 Refilling tasks in the safety storage cabinet	15
	6.5.1 General information, measurement method and devices	15
	6.5.2 Results of the measurement series and analysis	17
7	7. Summary	26

1. Identifying hazardous materials and handling them correctly

Hazardous materials must be marked with hazard pictograms. In order to standardise the labelling of hazardous materials, previously different worldwide, the Globally Harmonised System (GHS) was introduced by the CLP regulation of the EU with a transitional period from 1st December 2010 for materials and from 1st June 2015 for mixtures.

During this period, both the valid orange symbols and the new red and white GHS pictograms will be seen. The allocation of some of the hazards change, as different labelling systems from different countries have to be standardised.

Instead of the previously used R codes, H codes are now used for the type and severity of the hazard, and P codes replace the S codes for the provision of safety information. Advantage: The new codes are more specific than their predecessors.



GHS/CLP		GefStoffV	(German Ordinance on Hazardous Substances)
	Explosive		Explosive
	Compressed gases	no symbol	Non-existent
	Flammable Category 1 Flammable Category 2 Flammable Category 3	no symbol	Extremely flammable Highly flammable Flammable
	Oxidising Category 1, 2, 3		Oxidising
	Acute toxicity Category 1 Acute toxicity Category 2 Acute toxicity Category 3		Very toxic Very toxic resp. toxic Toxic resp. harmful
	Corrosive Category 1		Corrosive
	Acute toxicity Category 4 Corrosive Category 2 Skin irritant	no symbol no symbol	Harmful Irritant Non-existent
	CRM* Category 1A, 1B, 2 Respiratory sensitization	no symbol	Non-existent
	Environmental pollutant Hazardous to the aquatic environment		Dangerous to the environment

CMR*: C = carcinogenic, M = mutagenic, R = toxic to reproduction

The safe handling of hazardous materials is one of the most important tasks for the protection of the health of a company's employees. The employer has many obligations. It must determine the potential hazard of the respective materials applied, specify the necessary work procedures and take suitable protective measures to safeguard the employees from health risks and protect the environment from damage caused by the use of these materials, following the **STOP** principle.

Substitution of hazardous materials

The rule of substitution generally applies: substituting hazardous materials with non-hazardous or less hazardous ones is the best way to avoid the risk of damage caused by hazardous materials.

Many hazardous materials cannot be replaced or cannot yet be replaced or turned into less hazardous forms of use. Therefore, in most cases technical measures need to be taken to protect against the influences of hazardous materials.

Technical measures

Technical measures are based on the following principles

- ▶ Avoidance of the escape of hazardous materials
- ▶ Extraction, preferably at their point of origin

Organisational measures are:

- ▶ the determination of tasks and responsibilities,
- ▶ the selection and deployment of suitable employees,
- ▶ the implementation and monitoring of the regulations,
- ▶ the procurement of information regarding hazardous materials,
- ▶ the preparation of operating instructions with the following emphasis:
 - Designation of the hazardous material
 - Danger for persons and environment
 - Protective measures and codes of conduct
 - Response in case of danger
 - First aid
 - Proper disposal
- ▶ Regular staff training
- ▶ Check the concentration of hazardous substances in the work area,
- ▶ Check technical facilities and personal protective equipment.

Personal protective measures

If technical and organisational measures are not sufficient to ensure protection against hazardous materials, personal protective equipment must also be provided by the company, and must be used by the employees in compliance with the operating instructions. The following personal protective equipment is recommended, depending on the parts of the body that are endangered:

- ▶ Protective clothing
- ▶ Protective gloves
- ▶ Protective footwear
- ▶ Eye, face and head protection
- ▶ Respiratory protection

2. Safe storage of flammable liquids in work areas

Safe storage of flammable liquids in bottles, canisters or barrels in work areas plays an important role in the risk assessment – in particular with respect to fire and explosion protection.

The primary safety objective is to minimise the **fire load in the work areas** and prevent the stored substances from causing an additional hazard. State of the art safety storage cabinets with a defined fire resistance have proven an effective solution for many years. In addition, it is necessary to determine whether and, if so, to what extent additional explosion protection measures are needed.



Have you considered the potential impacts of a fire of flammable liquids?

Our video illustrates the fire resistance of 3 different types of safety storage cabinets typically used to store flammable liquids.

VIEW NOW:

www.youtube.com/asecoschannel



www.asecos.global

asecos GmbH

Sicherheit und Umweltschutz
Weierfeldsiedlung 16-18
DE-63584 Gründau

📞 +49 6051 92200
☎ +49 6051 922010
✉ info@asecos.com

Asecos BV

Veiligheid en milieubescherming
Christiaan Huygensweg 4
NL-2408 AJ Alphen a/d Rijn

📞 +31 172 506476
☎ +31 172 506541
✉ info@asecos.nl

asecos SARL

Sécurité et protection de l'environnement
7 rue du Pré Chaudron
FR-57070 Metz

📞 +33 3 87 78 62 80
✉ info@asecos.fr

asecos S.L.

Seguridad y Protección del Medio Ambiente
C/ Calderi, s/n - Ed. CIM Vallés, planta 7, oficinas 75-77
ES-08130 - Santa Perpètua de Mogoda
Barcelona

📞 +34 935 745911
☎ +34 935 745912
✉ info@asecos.es

asecos Ltd.

Safety and Environmental Protection
Profile House
Stores Road
Derby, Derbyshire
DE21 4BD

📞 +44 1332 415933
✉ info@asecos.co.uk

asecos

Safety and Environmental Protection Inc.
c/o Schumann Burghart LLP
1500 Broadway, Suite 1902
NYC 10036, New York, USA

📞 +1 727 251 9491
☎ +49 6051 922010
✉ info@asecos.com

asecos Schweiz AG

Sicherheit und Umweltschutz
Gewerbe Brunnmatt 5
CH-6264 Pfaffnau

📞 +41 62 754 04 57
☎ +41 62 754 04 58
✉ info@asecos.ch

asecos AB

Säkerhet och miljöskydd
Skyttelgatan 23
753 42 Uppsala

📞 +46 18 34 95 55
✉ info@asecos.se

**For all other countries please contact
asecos Headquarters in Germany.**

*No liability will be accepted for any printing errors, product changes due to new
technical developments, or model changes.*

© asecos GmbH 04/2024