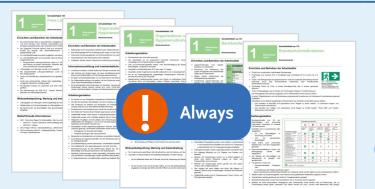


EMKG – Workplace & Chemicals

The EMKG supports companies in risk assessment of activities with hazardous substances. Accessible parameters are used to estimate hazards and match them with control strategies that are implemented using control guidance sheets (CGS). The red marks depict how the measures for the example of "Cleaning with Acetone" are determined.



Minimum Standards

Begin with the minimum standards and check if they are already implemented. These are basic protective measures for the entire workspace. The control guidance sheets of our series 100 give extensive support and can be used as checklists. They also contain advice for instruction and evaluation of effectiveness.

- CGS 100 General ventilation
- CGS 110 Organisational and hygiene measures "Inhalation"
- CGS 120 Skin protection basic safety precautions

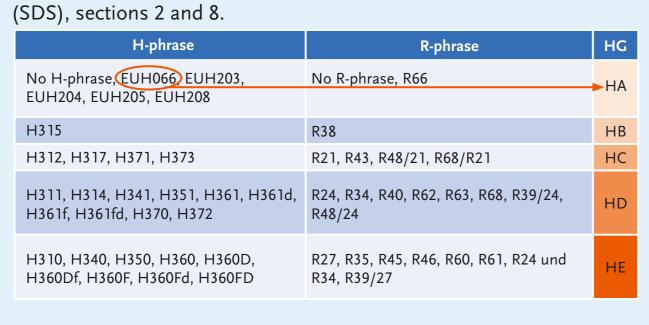
- CGS La-101 Storage of hazardous substances
- CGS pc-170 General fire prevention measures basic requirements

Skin

Inhalation

Hazard Group (HG) If a substance has an occupational exposure limit (OEL) it is used to determine the HG Inhalation. For substances without OEL and mixtures, the H-/R-phrases are used. Information on this can be found in the safety data sheet

liquids



Wet work requires the CGS 250. Wet work means here: working under humid conditions or with liquid-proof gloves for more than 2 hours, as well as frequently and intensively cleaning or disinfecting hands.

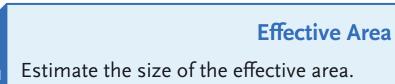
OEL according to TRGS 900		ccording to TRGS 900 H-phrase,		
solids (mg/m³)	liquids (ppm)	if no OEL applies	R-phrase, if no OEL applies	HG
10 to 1	500 to 50	No H-phrase, H304, H319, H335, H336, EUH201A, EUH207, EUH211, EUH212	No R-phrase, R36, R37, R65, R67	Α
1 to 0,1	50 to 5	H302, H318, H332, H371	R20, R22, R41, R68/20, R68/22	В
0,1 to 0,01	5 to 0,5	H301, H314, H331, H334, H341, H351, H361, H361d, H361f, H361fd, H370, H373, EUH029, EUH031, EUH070, EUH071	R23, R25, R29, R31, R34, R35, R40, R42, R62, R63, R68, R15/29, R39/23, R39/25, R48/20, R48/22	С
0,01 to 0,001	0,5 to 0,05	H300, H330, H360D, H360Df, H372, EUH032	R26, R28, R32, R61, R39/26, R39/28, R48/23, R48/25	D
Less than 0,001	Less than 0,05	H340, H350, H350i, H360, H360F, H360Fd, H360FD	R45, R46, R49, R60	Е

H-phrase	R-phrase	HG
No H-phrase*	No R-phrase*	рс-А
H226, H252, H280, H281, H290, EUH206, EUH209A	R10	рс-В
H222, H223, H224, H225 H228, H229, H251, EUH018, EUH209	R11, R12, R18, R30	рс-С
H242, H261, H270, H271, H272, EUH006, EUH014, EUH044	R5, R6, R7, R8, R9, R14, R15, R16, R44	pc-D
H200, H201, H202, H203, H204, H205, H206, H207, H208, H220, H221, H230, H231, H232, H240, H241, H250, H260, EUH001, EUH019	R1, R2, R3, R4, R17, R19	рс-Е
Non-classified dust producing solids are assigned to pcare assigned based on their combustion factor (CF, acco		

Fire and Explosion

(CF 1 to 3) or pc-B (CF 4 to 6).

ml



Do not take protective equipment into account. small Effective Area:

Effective Area:

splashes e.g. hands, forearms large

Quantity Group		small	m
Estimate the quantities used during the activity.		300 ml — 300 — 210 — 200 — 150 — 150 — 150	
	solids	g	

Duration of Skin Contact Estimate the duration of the skin contact. Short term contact Long term contact more than 15 min/day long short Skin contact ends only when the hazardous substance is washed off

Release Group

Determine the release group for solids and liquids. Information for the determination can be found in the SDS, section 9.

Hint:

Some activities can lead to dust abrasion like conveying, offloading or pouring of materials. When the dust produced is very fine, choose the release group "high". This applies especially when working with pellets or grained substances.

	low	medium	high				
solids							
	coarse-grained: no dust existing (e.g. granules, pellets, wax)	grainy: dust that settles after some time (e.g. washing powder, sugar)	fine powder: dust that stays in the air for several minutes (e.g. flour, toner powder)				
liquids* boiling point	higher than 150 °C	50 to 150 °C	less than 50 °C				
or vapour pressure	less than 5 hPa	5 to 250 hPa	higher than 250 hPa				
*applies for working conditions at room temperature.							

Control Strategy

By combination of the results of steps 1 to 3, the control strategy level can be derived. Measures described in the control guidance sheets of series 100 are minimum standards and always have to be implemented. Depending on the control strategy level, additional measures might be required.

l	HG	Effective Area	Duration of Skin Contact	Control Strategy Level	Level 1 • Good practice
		- small	short long —		Control guidance sheet 120
	HA		short		
		large	lang		1
			short		Level 2Technical and organisational
	НВ	small	long		measures
		large	short		Control guidance sheet 250
Step 4			long		
	НС	small large	short		
			long		Level 3
			short		High need for measures
		large	long		• Substitution
		small	short		Closed system
	HD		long		
		large	short		* If H361, R35, R62 or R63, control
		8-	long	*	guidance sheet 250 is sufficient.
		small	short	*	
	HE		long		
		large	short		
		8-	long		

HG	Quantity	Release Group			
		low	medium	high	
	➤ small —		→		
A	medium		liquid solid		
, n	large		liquid		
	small		solid		
В	medium				
	large		liquid solid		
	small		solid liquid		-
С	medium				
	large				
	small		solid		
D	medium		liquid		
	large		Expert advice		
E	Expert advice				

Level 1Good practiceControl guidance sheet series 100
Level 2 • Technical measures • Control guidance sheet series 200
Level 3 Closed system Control guidance sheet series 300
Expert advice required

HG	Quantity	R					
	\	low	medium		high		
	small						
рс-А	medium				**		
	large		**		**		
	small						
рс-В	medium		**		**	•	
	large	**	**		**		
	► small -			7	liquid		
	Siliali				solid		
рс-С	medium	**			liquid		
	medium				solid	•	
	large	**					
pc-D	Expert advice						
рс-Е	Expert advice						

	Level 1
	Good practice
	Control guidance sheet series 100
	gamma and a second and
	Level 2
	Technical measures
	Control guidance sheet series 200
	Advanced fire protection measures
	Preventive explosion protection
	 Activity-specific avoidance of ignition sources
	Level 3
	 Closed system
1	 Closed system Control guidance sheet series 300
1	Control guidance sheet series 300
ł	Control guidance sheet series 300High fire protection measures
l	 Control guidance sheet series 300 High fire protection measures System-specific/activity-specific avoidance
1	 Control guidance sheet series 300 High fire protection measures System-specific/activity-specific avoidance of ignition sources
}	 Control guidance sheet series 300 High fire protection measures System-specific/activity-specific avoidance
i i	 Control guidance sheet series 300 High fire protection measures System-specific/activity-specific avoidance of ignition sources
1	 Control guidance sheet series 300 High fire protection measures System-specific/activity-specific avoidance of ignition sources Constructive explosion protection
1	 Control guidance sheet series 300 High fire protection measures System-specific/activity-specific avoidance of ignition sources
i	 Control guidance sheet series 300 High fire protection measures System-specific/activity-specific avoidance of ignition sources Constructive explosion protection
1	 Control guidance sheet series 300 High fire protection measures System-specific/activity-specific avoidance of ignition sources Constructive explosion protection

measures are sufficient.

Exam	ple:	Cl	eani	ng	with	Acetone

	Step	Skin	Inhalation	Fire and Explosion				
	1	$EUH066 \rightarrow HG = HA$	OEL 500 ppm \rightarrow HG = A	$H225 \rightarrow HG = pc-C$				
	2	Splashes → Effective Area = small	100 ml used → Quantity Group = small	100 ml used → Quantity Group = small				
	3	Hazardous substance is not removed fast → Duration of Skin Contact = long	liquid, boiling point 56 °C → Release Group = medium	liquid, boiling point 56 °C → Release Group = medium				
Control Strategy Level 1: Control guidance sheets of series 100 are sufficient to contain the hazard.								

Evaluation of Effectiveness of Protective Measures

- Evaluate if: Good organisational and hygiene measures are employed OELs are complied
- Technical devices are checked and examined
- Work is performed with low dust (e.g. wet cleaning, no blowing away of dust deposits)
- Appropriate protective gloves and skin care are used
- The employees have enough time to implement measures

