Federal Institute for Occupational Safety and Health

EMKG - Workplace & Chemicals

Systematic risk assessment

OSH Conference 2021

Mombasa, 26th November 2021 (virtual event)

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What are hazardous substances?

https://pixabay.com/de/

CLP Pictograms									
Hazard pictograms									
Description	Explosive bombe	Flame	Flame over circle	Skulls and Crossbones	Health hazard	Corrosion	Exclamation Mark	Gas cylinder	Environment

The risk assessment cycle

Basic requirements

Financial, human, material and time resources are available

Good Organisation

Images: https://pixabay.com/de/

Procedure

Hazardous substances information

- Classification and labelling
- Assessment criteria
- safety parameters

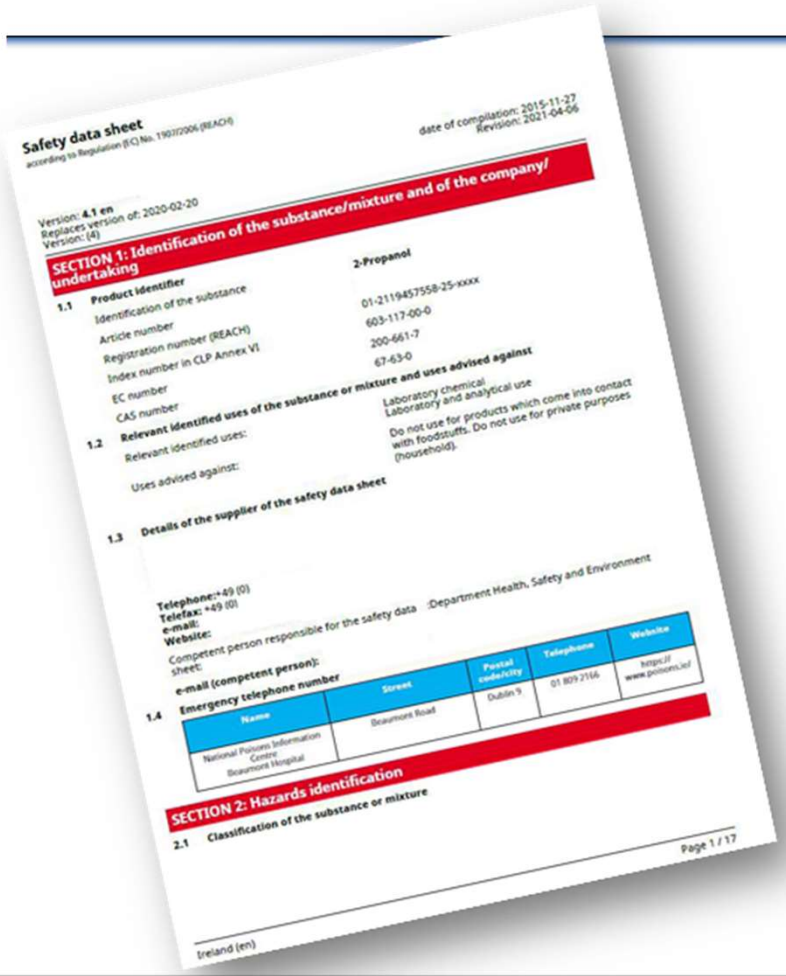
Risk

Measures

Activity and company-specific information

- Quantities, duration, frequency
- Operating procedure
- Protective measures on site
- adjacent workplaces

Information sources



Safety data sheet
according to Regulation (EC) No. 1907/2006 (REACH)

date of compilation: 2015-11-27
Revision: 2021-04-06

Version: 4.1 en
Replaces version of: 2020-02-20
Version: (4)

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier — 2-Propanol
Identification of the substance
Article number — 01-2119457558-25-xxxx
Registration number (REACH) — 603-117-00-0
Index number in CLP Annex VI — 200-661-7
EC number — 67-63-0
CAS number

1.2 Relevant identified uses of the substance or mixture and uses advised against
Relevant identified uses: — Laboratory chemical
Laboratory and analytical use
Uses advised against: — Do not use for products which come into contact with foodstuffs. Do not use for private purposes (household).

1.3 Details of the supplier of the safety data sheet

Telephone: +49 (0)
Telefax: +49 (0)
e-mail:
Website:
Competent person responsible for the safety data sheet: Department Health, Safety and Environment
e-mail (competent person):

1.4 Emergency telephone number

Name	Street	Postal code/city	Telephone	Website
National Poisons Information Centre Beaumont Hospital	Beaumont Road	Dublin 9	01 809 2166	https:// www.poisons.ie/

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

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Ireland (en)

- **Safety data sheet**
- Information on packaging, instructions for use
- Technical Rules for Hazardous Substances (TRGS)*
- Sector- or activity-specific assistance from the accident insurance institutions, federal states, associations*
- **Workplace**

*in Germany

Plausibility check SDS


Image: www.pixabay.com

Example questions:

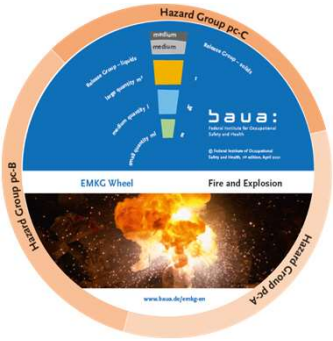
1. Are there sections missing?
2. Label elements on the label = in the SDS?
3. Is the information in sections 7 and 8 complete?
4. Do the H-phrases match the information in section 14?
5. Are the specifications of different suppliers the same for a specific substance or mixture (e.g. C&L, OEL) ?

EMKG - Easy-to-use workplace control scheme for hazardous substances

Hazard group

Effective Area	Release Group
Duration of Skincontact	Quantity Group

- Control Strategy Level 1
- Control Strategy Level 2
- Control Strategy Level 3
- Expert advice

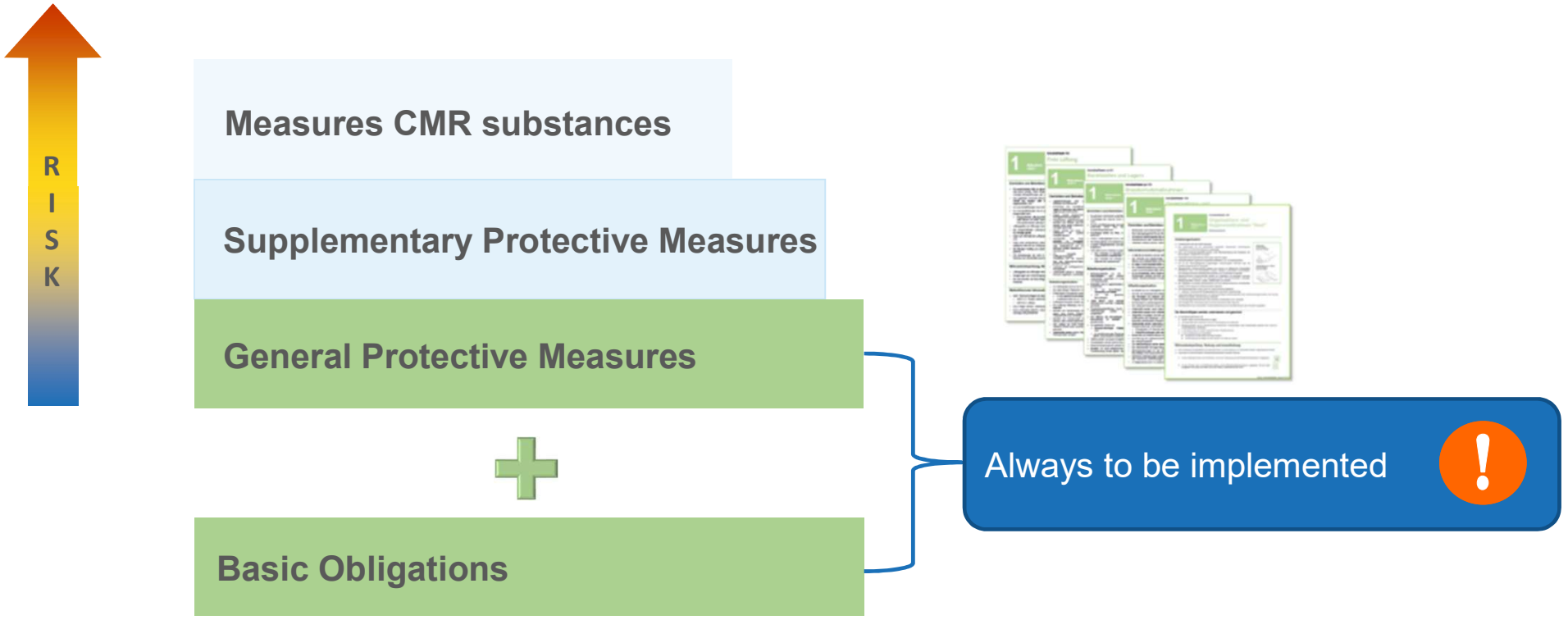


Control Guidance Sheets (CGS) concretize the measure level


EMKG –
Control Guidance Sheets:
A modular system of measures,
based on each other
!
https://pixabay.com/de/

Determination of Protective Measures

Taking into account the graduated concept of risk control measures of the Hazardous Substances Ordinance



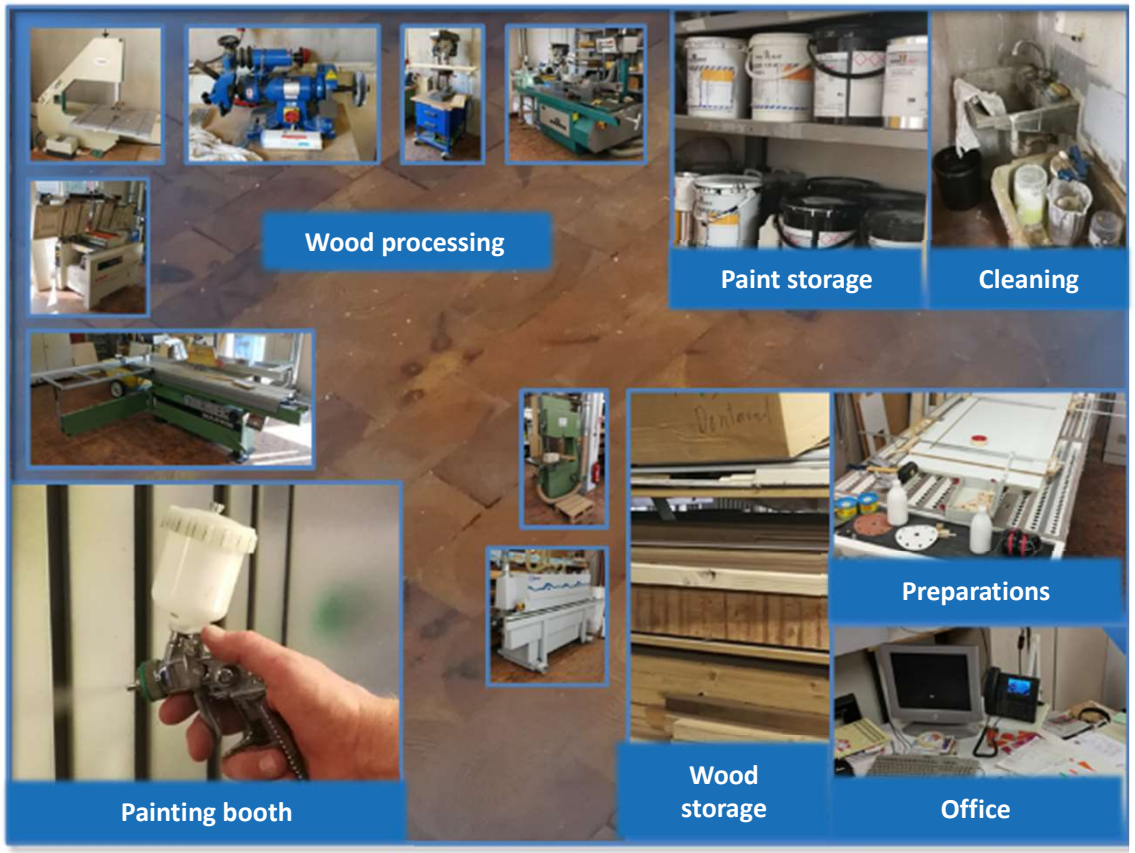
Example: Wood-Workshop

Step 1:
Divide into
Working Areas

Step 2:
Implement the
Minimum Standards

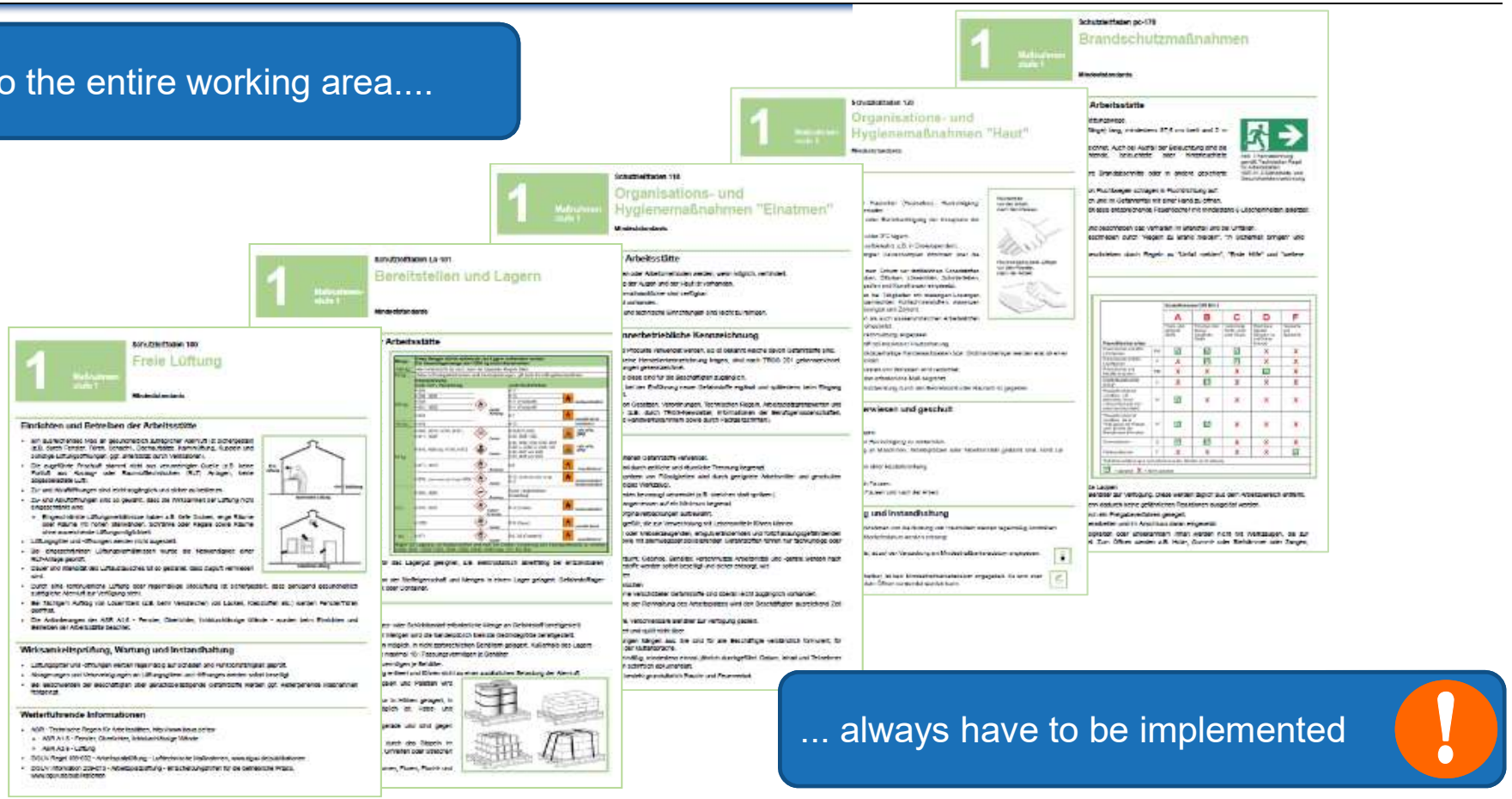
Step 3:
Define the
Activities

Step 4:
Identify the
Risks



Minimum Standards

Apply to the entire working area....



... always have to be implemented

CGS 100 General ventilation

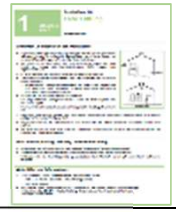
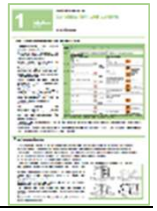


Image: www.pixabay.de

- Draught is avoided
- Sufficient clean, fresh air is ensured
- In case of restricted ventilation, check the use of a ventilation and air-conditioning system

CGS La-101 Storage of hazardous substances



- Everything stands safely and is secured against falling out and over
- Furnishings and equipment enable clear storage
- Do not store hazardous substances in break- , stand-by- and sanitary rooms

CGS 110 Organisational and hygiene measures „Inhalation“

- Containers may only be opened during use
- Hazardous substances are not filled into containers that could lead to confusion with food
- All containers and packaging are correctly labelled (TRGS 201 or manufacturer's labelling)

CGS 110 Organisational and hygiene measures „Inhalation“

- Food and beverages are not stored or consumed at the workplace
- General ban on smoking and fires
- Workplaces are regularly tidied and cleaned

CGS 120 Skin protection – basic safety precautions

- Contaminated skin is cleaned immediately
- The washing area is equipped with sufficient skin products and disposable towels
- Solvents or thinners are not used to clean the skin

CGS pc-170 General fire prevention measures – basic requirements

Image: www.pixabay.de

- Escape routes are sufficiently short
- Ignition sources are avoided
- Fire extinguishers are present, maintained and according to the fire class

Next step: Information from the safety data sheet

SDS Section 2 and 8

H-phrases and
occupational exposure limit

Hazard Group

SDS Section 9

Boiling point
or vapour pressure

Release Group


Hazard Group HA
Hazard Group HB
Hazard Group HC
Hazard Group HD
Hazard Group HE
Effective Area
small
Duration of skin contact
short
Control strategy level
baua:
Federal Institute for Occupational Safety and Health
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EMKG Wheel
Skin
www.baua.de/emkg-en

Module skin

Skin contact excluded?

Personal protective equipment (PPE) does not prevent skin contact

Example: Cleaning a workpiece

Hazard statements:

H225: Highly flammable liquid and vapour
H319: Causes serious eye irritation
H336: May cause drowsiness or dizziness

Signal word: Danger
Pictograms: GHS02, GHS07

OEL: 500 mg/m³; **200 ppm**

Boiling point: **82°C**

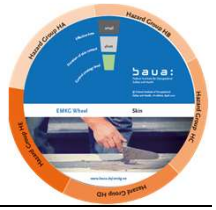
Job Description:

Cleaning a workpiece with Isopropanol and a cloth

Duration: **10 minutes**
Amount: **50 ml**

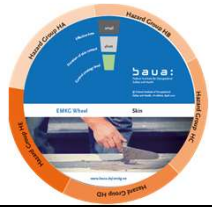
Images: www.pixabay.com

Step 1: Hazard Group



H-phrase	R-phrase	HG
No H-phrase, EUH066, EUH203, EUH204, EUH205, EUH208	No R-phrase, R66	**HA**
H315	R38	**HB**
H312, H317, H371, H373	R21, R43, R48/21, R68/R21	**HC**
H311, H314, H341, H351, H361, H361d, H361f, H361fd, H370, H372	R24, R34, R40, R62, R63, R68, R39/24, R48/24	**HD**
H310, H340, H350, H360, H360D, H360Df, H360F, H360Fd, H360FD	R27, R35, R45, R46, R60, R61, R24 and R34, R39/27	**HE**

Step 2: Effective Area



SMALL:
wetting of small areas (splashes)

LARGE:
wetting of large areas (e.g. hands, forearms)

Wearing of PPE, e.g. protective gloves, does not change the size of the effective area

Step 3: Duration of Skin Contact

SHORT

chriso/iStock.com

LONG

Skin contact ends only when the hazardous substance is washed off

HG	Effective Area	Duration of skin contact	Control strategy level
HA	small	short	
		long	
	large	short	
		long	
HB	small	short	
		long	
	large	short	
		long	
HC	small	short	
		long	
	large	short	
		long	
HD	small	short	
		long	
	large	short	
		long	*
HE	small	short	*
		long	
	large	short	
		long	

* If H361, R35, R62 or R63, then control guidance sheet 250 is sufficient

Level 1
- Low need for measures
- Control guidance sheet 120 „Organisational and Hygienic measures Skin“

Level 2
- Extended need for measures
- Technical and organisational measures
- Control guidance sheet 250

Level 3
- High need for measures
- Substitution
- Closed System

Result: Cleaning a workpiece

Step 1: Hazard Group (HG)

Assign the HG according to the H- or R-Phrases.

H-Phrase	R-Phrase	HG
No H-Phrase, EUH066, EUH203, EUH204, EUH205, EUH208	No R-Phrase, R66	HA
H315	R38	HB
H312, H317, H371, H373	R21, R43, R48/21, R68/R21	HC
H311, H314 (skin corr. 1B, 1C), H341, H351, H361, H361d, H361f, H361fd, H370, H372	R24, R34, R40, R62, R63, R68, R39/24, R48/24	HD
H310, H314 (skin corr. 1A), H340, H350, H360, H360D, H360Df, H360F, H360Fd, H360FD	R27, R35, R45, R46, R60, R61, R24 und R34, R39/27	HE

Hazard Group
HA
(no H-phrase)

Step 2: Effective Area

Estimate the size of the effective area. Do not take protective equipment into account.

Skin Contact	Effective Area
small wetting area (only a few splashes)	small
large wetting area (e. g. hands or forearms)	large

Effective Area
large
(cloth, hand)

Step 3: Duration of Skin Contact

Estimate the duration of the skin contact. Repeated contact times are added over a day. The duration of skin contact ends with effective removal of the hazardous substance.

Skin Contact	Duration of Skin Contact
less than 15 Min/Day	short
more than 15 Min/Day	long

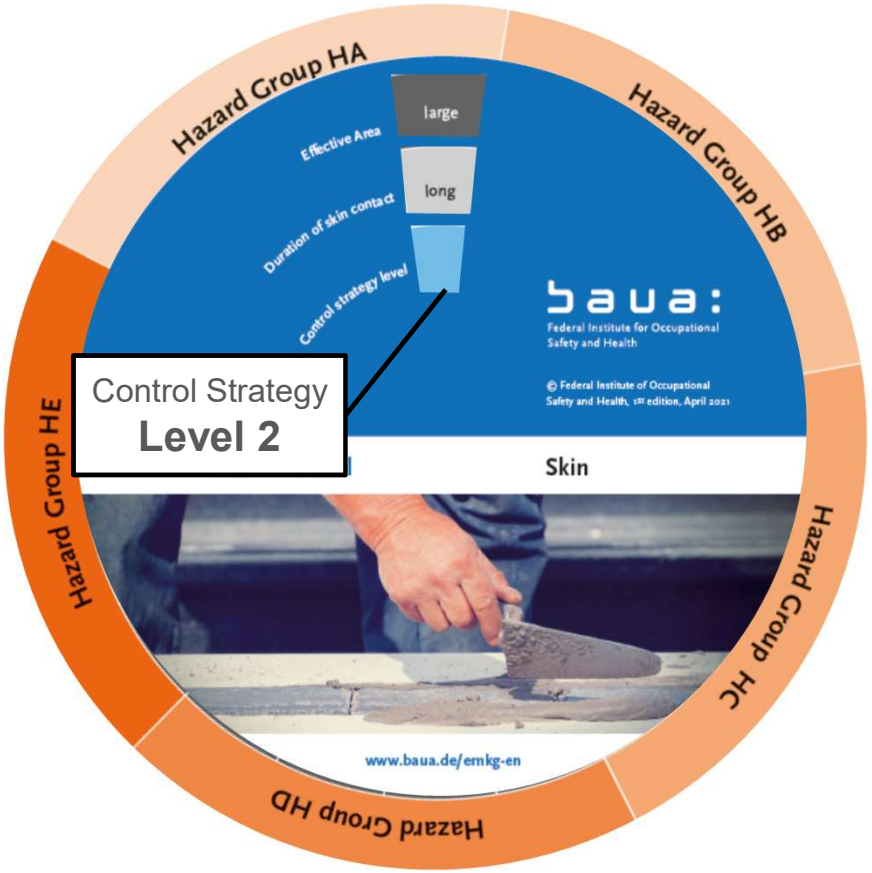
Duration
of skin contact
long
(substance is
usually not
removed
immediately)

Step 4: Control Strategy

Select the appropriate Hazard Group on the front of the wheel. Make sure that the identified effective area and duration of skin contact are visible in the two upper wedge segments. Now you can read the colour code. The colours represent the control strategy level:

- Organisation and Hygiene measures = Control guidance sheet 120
- Advanced measures = Control guidance sheet 250
- Closed system = Control guidance sheets series 300

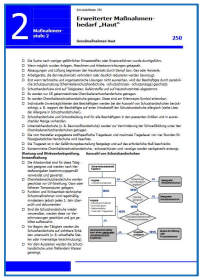
* If H314, H361, R35, R62 or R63, control guidance sheet 250 is sufficient.

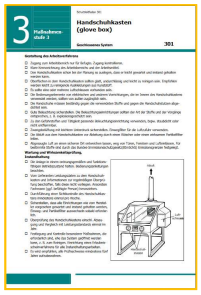


Control Strategy
Level 2

baua:

Need for measures: Skin





Control Strategy Level 1:

Low need for measures

- Minimum standards
- Control Guidance Sheet 120: Skin protection - basic safety precautions

Control Strategy Level 2:

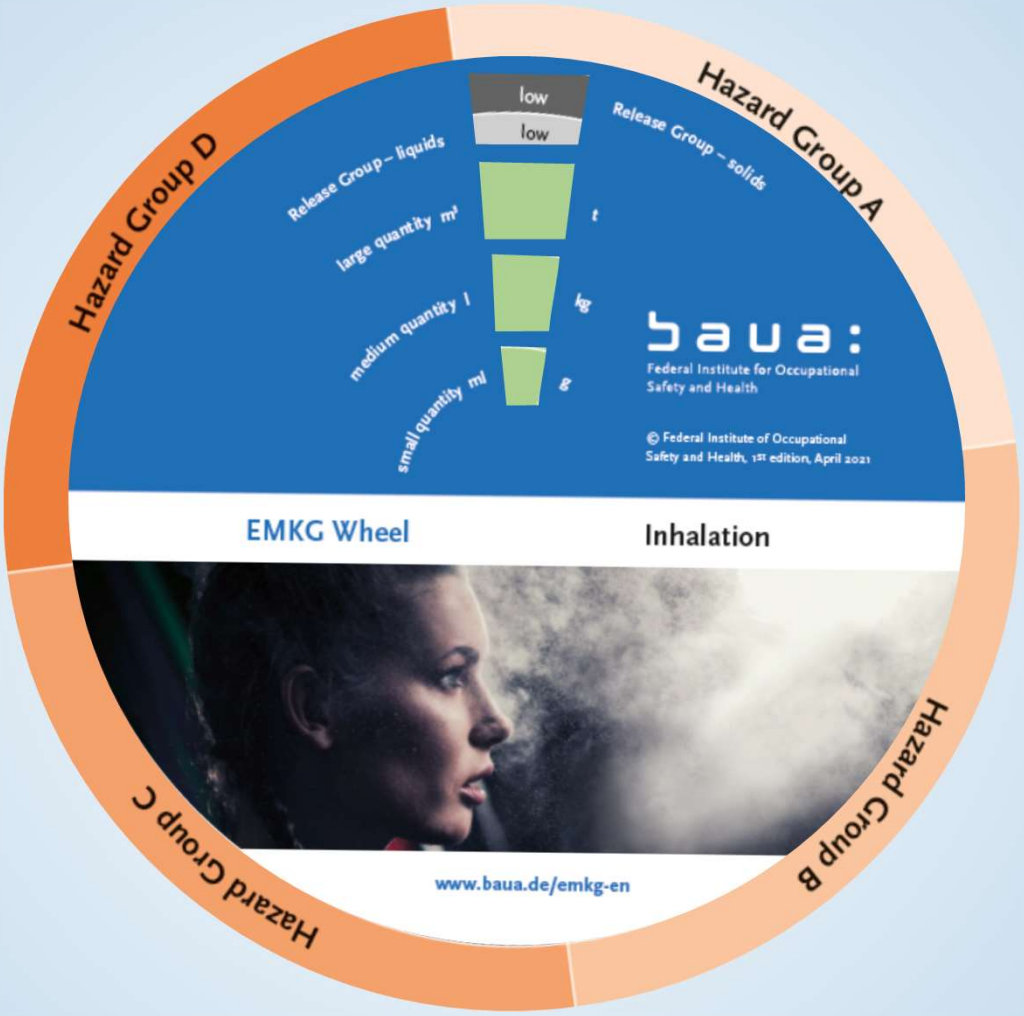
Extended need for measures

- Minimise skin contact with technical and organisational measures
- otherwise use PPE with instruction of employees
- Occupational medical advice
- Control Guidance Sheet 250: Skin protection – Extended Safety Precautions
  - Measures for skin sensitizing substances
  - Measures for wet workplaces

Control Strategy Level 3:

High need for measures

- Substitution
- Closed system e.g. glove box



Module Inhalation

Step 1: Hazard Group Inhalation – Special case

SUBSTANCES WITH OEL → HAZARD GROUP VIA OEL

SUBSTANCES WITHOUT OEL OR MIXTURES → HAZARD GROUP VIA CLASSIFICATION/ LABELLING

OEL = Occupational exposure limit value (national) according to TRGS 900

📖 Section 8 in the safety data sheet

Example: Cleaning a workpiece

Hazard statements:

H225: Highly flammable liquid and vapour
H319: Causes serious eye irritation
H336: May cause drowsiness or dizziness

Signal word: Danger

Pictograms: GHS02, GHS07

OEL: 500 mg/m³; **200 ppm**

Boiling point: **82°C**

Job Description:

Cleaning a workpiece with Isopropanol and a cloth

Duration: **10 minutes**
Amount: **50 ml**

Images: www.pixabay.com

Step 1: Hazard group

OEL according to TRGS 900		H-phrase, if no OEL applies	R-phrase, if no OEL applies	HG
solids (mg/m³)	liquids (ppm)			
10 to 1	500 to 50	No H-phrase, H304, H319, H335, H336, EUH201A, EUH207, EUH211, EUH212	No R-phrase, R36, R37, R65, R67	A
1 to 0.1	50 to 5	H302, H318, H332, H371	R20, R22, R41, R68/20, R68/22	B
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	C
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	E

Step 2: Quantity Group

50 ml

small	medium	large
		
ml/g	l/kg	m³/t
Image: studiocasper/iStock.com	Image: adventtr/iStock.com	Image: Nerthuz/iStock.com

Quantity per activity

Step 3: Release group

Liquids

82 °C

	low	medium	high
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

Image: www.pixabay.com

📖 Boiling point and vapour pressure: Section 9 in the safety data sheet

Step 3: Release Group

Solids

	bigger than 1 mm	1 to 0.5 mm	smaller than 0.5 mm
			
	low	**medium**	**high**
Dusting behaviour	**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)

HG	Quantity	Release Group		
		low	medium	high
A	small			
	medium		Liquid	
			Solid	
	large		Liquid	
			Solid	
B	small			
	medium			
	large		Liquid	
			Solid	
C	small		Solid	
			Liquid	
	medium			
	large			
D	small		Solid	
			Liquid	
	medium		Expert advice	
	large			
E	Expert advice			

Level 1
- Minimum standards
- Control 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

Result: Cleaning a workpiece

Step 1: Hazard Group (HG)
Assign the HG according to the occupational exposure limit (OEL) or the H-/R-Phrases

OEL according to TRGS 900		H-Phrase if no OEL applies	R-Phrase if no OEL applies	HG
solids (mg/m³)	liquids (ppm)			
10 to 1	500 to 50	No H-Phrase, H304, H319, H335, H336, EUH201A, EUH209, EUH211, EUH212	No R-Phrase, R36, R37, R65, R67	A
1 to 0,1	50 to 5	H302, H318, H332, H371	R20, R22, R41, R68/20, R68/22	B
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	C
0,01 to 0,001	0,5 to 0,05	H300, H330, H360D, H360D(, 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	E

Activities involving substances of Hazard Group E require expert advice.

Step 2: Quantity Group Do you use large (m³ or t), medium (l or kg) or small (ml or g) quantities?

Step 3: Release Group Determine the Release Group for solids and liquids.

	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[1] boiling point or vapor pressure	higher than 150°C	50 to 150°C	[illegible]
	less than 5 hPa	5 to 250 hPa	higher than 250 hPa

[1] applicable for activities at room temperature

Step 4: Control Strategy

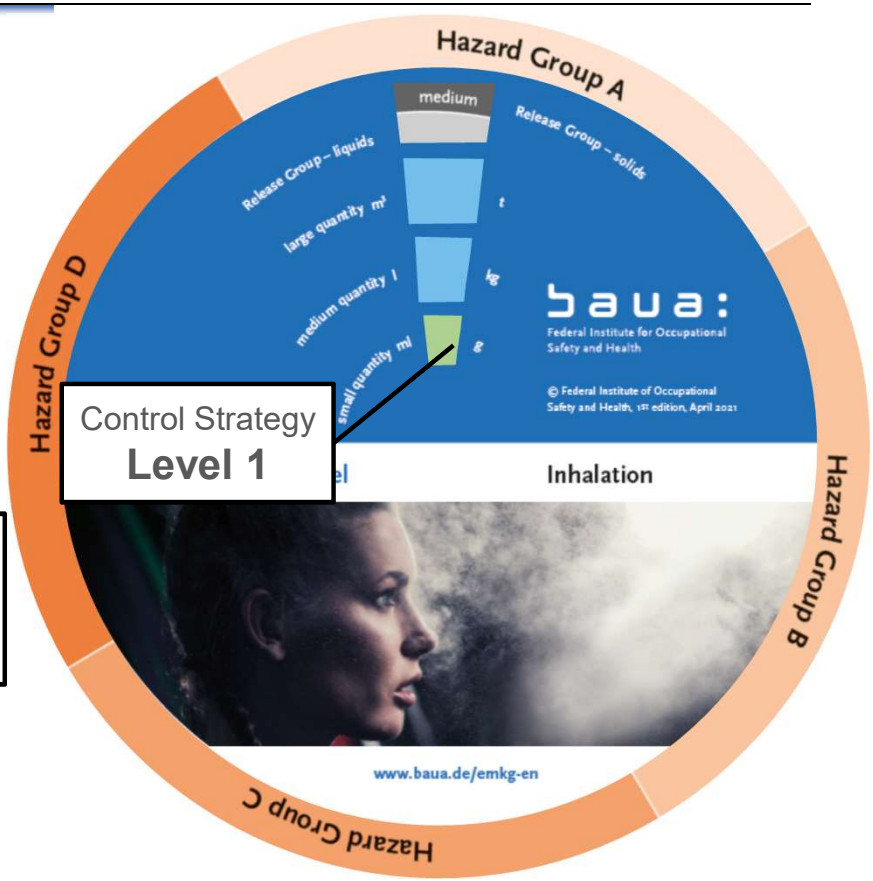
Select the appropriate Hazard Group on the front of the wheel. Make sure that the identified Release Group is visible in the upper wedge segment. Now you can read the colour code, according to your quantity group. The colours represent the control strategy level:

- Minimum standards = Control guidance sheets series 100
- Technical measures = Control guidance sheets series 200
- Closed system = Control guidance sheets series 300
- Expert advice required

Hazard Group
A
(OEL 200 ppm)

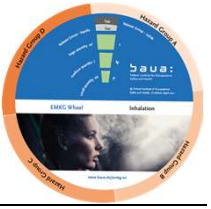
Quantity Group
small
(50 mL)

Release Group
medium
(boiling point 82°C)

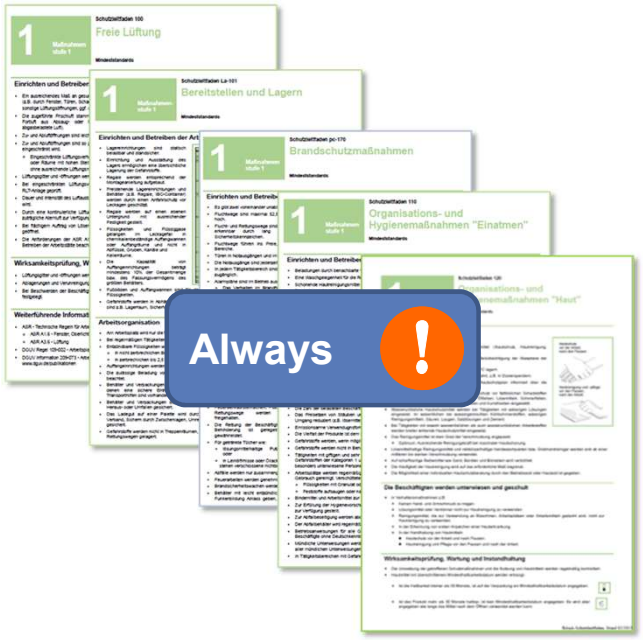


Control Strategy
Level 1

Need for measures: Inhalation



Control Strategy Level 1

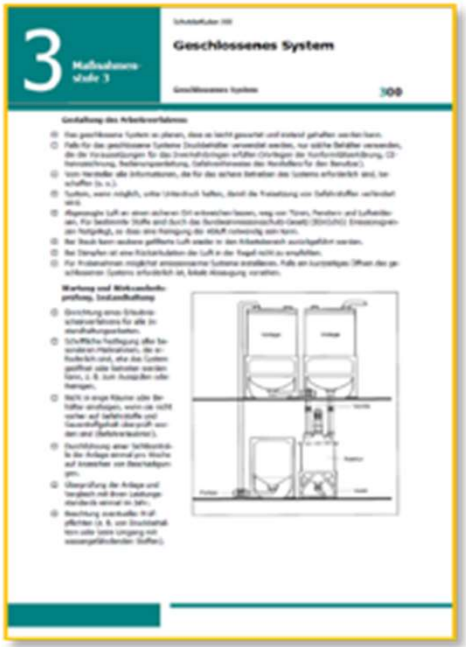


Minimum standards = Control Guidance Sheets 1xx

Control Strategy Level 2

Technical measures = Control Guidance Sheets 2xx

Control Strategy Level 3



Closed system = Control Guidance Sheets 3xx

Occupational exposure limit values; compliance check

- Workplace measurements
- Results from comparable workplaces in your own company
- Results of comparable workplaces from other sources e.g.:
  - Substance- or activity-specific TRGS
  - Process and substance-specific criteria (VSK)
  - Sector- or activity-specific assistance from the accident insurance institutions, federal states, associations
- Calculate OEL compliance (as a worst-case scenario)
- **EMKG as a non-measuring identification method**

EMKG as a non-measuring identification method

Example: Isopropanol, liquid

OEL according to TRGS 900:
200 ppm

Hazard Group (HG)
A
- Inhalation -

HG	Air concentration range	
A	500 – 50	ppm
B	50 – 5	ppm
C	5 – 0,5	ppm
D	0,5 – 0,05	ppm
E	Less than 0.05	ppm

HG B
instead of
HG A

Same Control Strategy Level? !

Result: OEL compliance via EMKG

Step 1: Hazard Group (HG)
Assign the HG according to the occupational exposure limit (OEL) or the H-/R-Phrases

OEL according to TRGS 900		H-Phrase if no OEL applies	R-Phrase if no OEL applies	HG
solids (mg/m³)	liquids (ppm)			
10 to 1	500 to 50	No H-Phrase, H304, H319, H335, H336, EUH201A, EUH209, EUH211, EUH212	No R-Phrase, R36, R37, R65, R67	A
1 to 0,1	50 to 5	H302, H318, H332, H371	R20, R22, R41, R68/20, R68/22	B
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	C
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	E

Activities involving substances of Hazard Group E require expert advice.

Step 2: Quantity Group Do you use large (m³ or t), medium (l or kg) or small (ml or g) quantities?

Step 3: Release Group Determine the Release Group for solids and liquids.

		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[1]	boiling point or vapor pressure	higher than 150°C	50 to 150°C	less than 50°C
		less than 5 hPa	5 to 250 hPa	higher than 250 hPa

[1] applicable for activities at room temperature

Step 4: Control Strategy

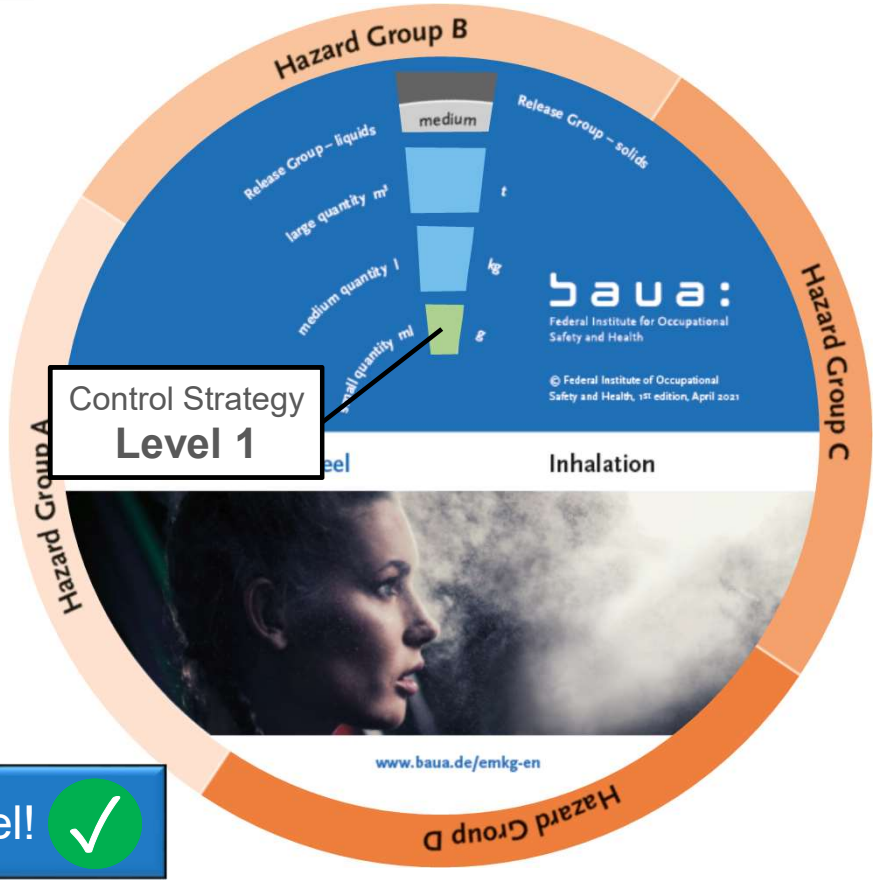
Select the appropriate Hazard Group on the front of the wheel. Make sure that the identified Release Group is visible in the upper wedge segment. Now you can read the colour code, according to your quantity group. The colours represent the control strategy level:

- Minimum standards = Control guidance sheets series 100
- Technical measures = Control guidance sheets series
- Closed system = Control guidance sheets series 300
- Expert advice required

Hazard Group
B
(OEL 200 ppm)
+ 1 HG

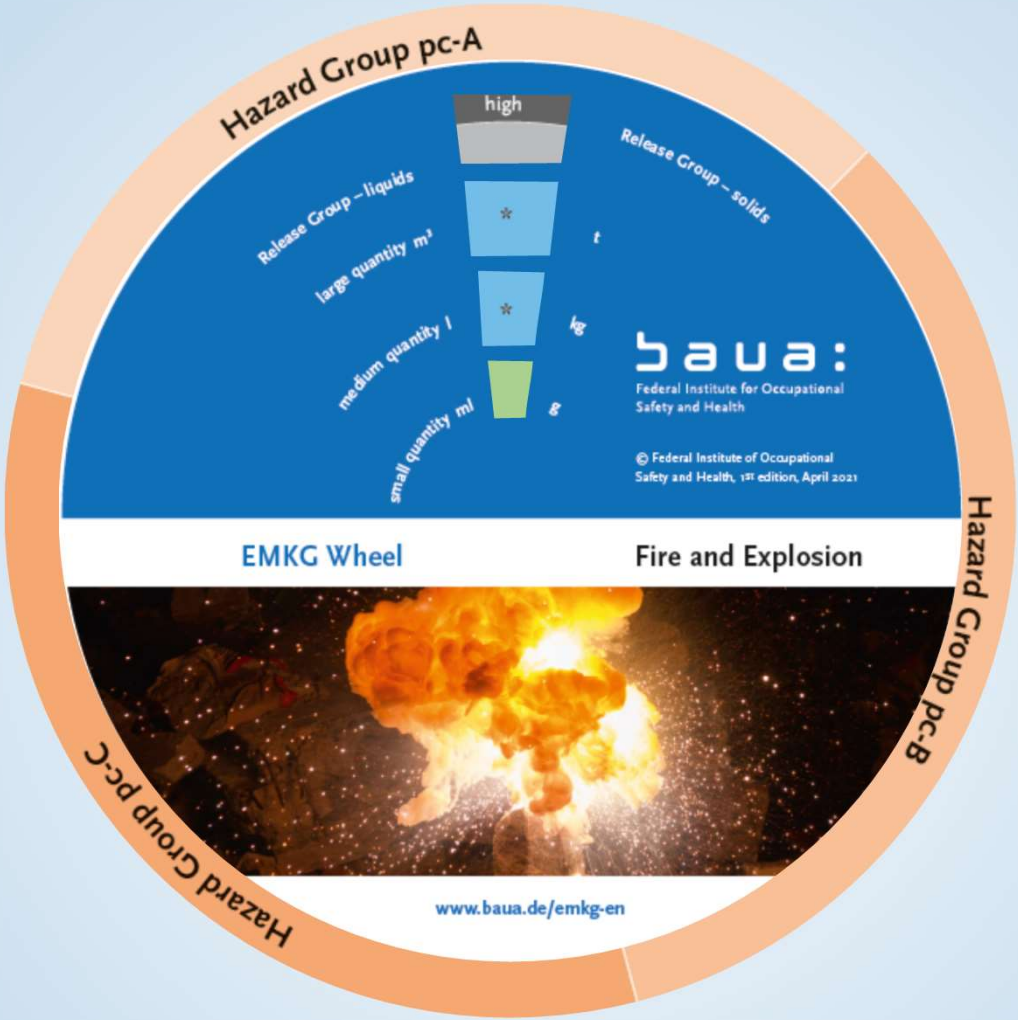
Quantity Group
small
(50 ml)

Release Group
medium
(boiling point 82°C)



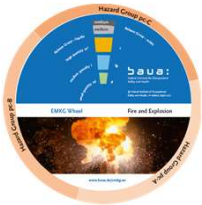
Control Strategy
Level 1

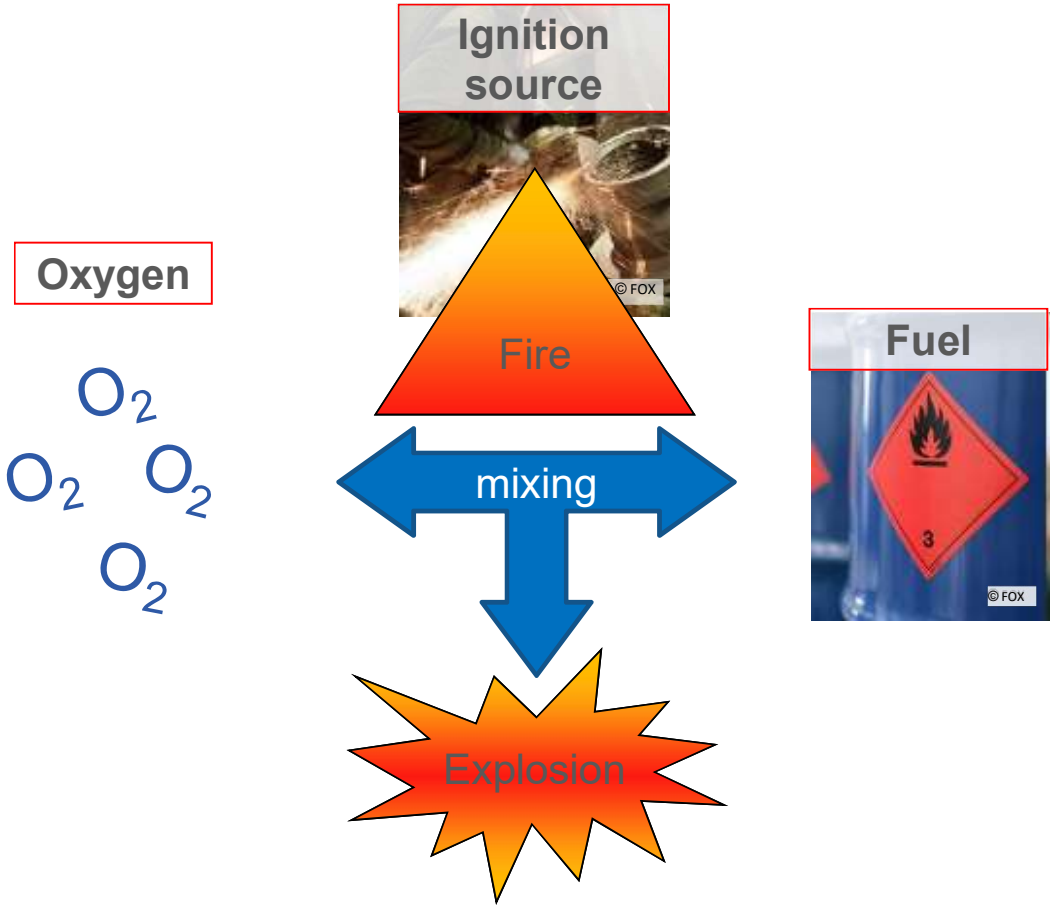
Same Control Strategy Level! ✓



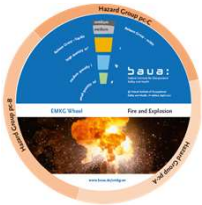
Module Fire and Explosion

Physico-chemical requirements





Example: Cleaning a workpiece



Hazard statements:

H225: Highly flammable liquid and vapour
H319: Causes serious eye irritation
H336: May cause drowsiness or dizziness

Signal word: Danger
Pictograms: GHS02, GHS07 

OEL: 500 mg/m³; **200 ppm**

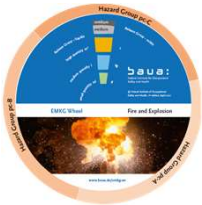
Boiling point: **82°C**

Job Description:
Cleaning a workpiece with Isopropanol and a cloth

Duration: **10 minutes**
Amount: **50 ml**

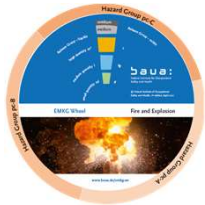
Images: www.pixabay.com

Step 1: Hazard Group



H-phrase	R-phrase	HG
No H-phrase	No R-phrase	**pc-A**
H226, H252, H280, H281, H290, EUH206, EUH209A	R10	**pc-B**
H222, H223, H224, H225, H228, H229, H251, EUH018, EUH209	R11, R12, R18, R30	**pc-C**
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	**pc-E**

Step 2: Quantity Group

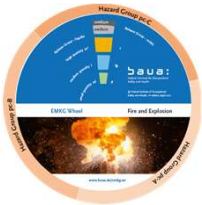


50 ml

small	medium	large
		
ml/g	l/kg	m³/t
Image: studiocasper/iStock.com	Image: adventtr/iStock.com	Image: Nerthuz/iStock.com

Quantity per activity

Step 3: Release Group



Liquids

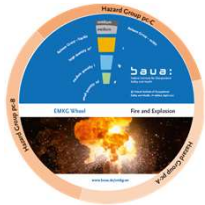
82 °C

	low	medium	high
Boiling point	more than 150°C	50 to 150°C	less than 50°C
or vapour pressure	less than 5 hPa	5 to 250 hPa	more than 250 hPa

Image: www.pixabay.com

📖 Boiling point and vapour pressure: Section 9 in the safety data sheet

Step 3: Release Group

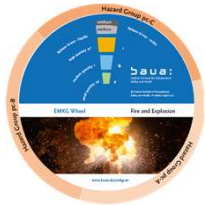


Solids

	bigger than 1 mm	1 to 0.5 mm	smaller than 0.5 mm
			
Dusting behaviour	**low**	**medium**	**high**
	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)

HG	Quantity	Release Group		
		low	medium	high
pc-A	small			
	medium			*
	large		*	
pc-B	small			
	medium		*	*
	large	*	*	*
pc-C	small			liquid
				solid
	medium	*		liquid
				solid
	large	*		
pc-D	Expert advice			
pc-E	Expert advice			

* When dealing with solids, fire prevention measures are sufficient



Level 1
- Minimum standards = CGS 1xx
- General fire protection measures

Level 2
- Technical measures = CGS 2xx
- Advanced fire protection measures
- Preventive explosion protection
- Activity-specific avoidance of ignition sources

Level 3
- Closed system = CGS 3xx
- High fire protection measures
- System-/ activity-specific avoidance of ignition sources
- Constructive explosion protection

Expert advice required

Result: Cleaning a workpiece

Step 1: Hazard Group (HG)

Assign the HG according to the H- or R-Phrases.

H-Phrase	R-Phrase	GG
No H-Phrase[1]	No R-Phrase[1]	pc-A
H226, H252, H280, H281, H290, EUH206, EUH209A	R10	pc-B
H222, H223, H224, H225, H228, H229, H251, EUH018, EUH209	R11, R12, R18, R30	pc-C
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	pc-E

[1] Non-classified dust producing solids are classified as pc-C in general. Non-explosive solids are classified according to their combustion factor (CF) in HG pc-A (CF 1 to 3) or pc-B (CF 4 to 6).

Activities involving substances of hazard group pc-D and pc-E require expert advice.

Step 2: Quantity Group Do you use large (m³ oder t), medium (l or kg) or small (ml or g) quantities?

Step 3: Release Group Determine the Release Group for solids and liquids.

	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[2] boiling point or vapor pressure	higher than 150°C	50 to 150°C	less than 50°C
	less than 5 hPa	5 to 250 hPa	higher than 250 hPa

[2] applicable for activities at room temperature

Step 4: Control Strategy

Select the appropriate Hazard Group on the front of the wheel. Make sure that the identified Release Group is visible in the upper wedge segment. Now you can read the colour code, according to your quantity group. The colours represent the control strategy level:

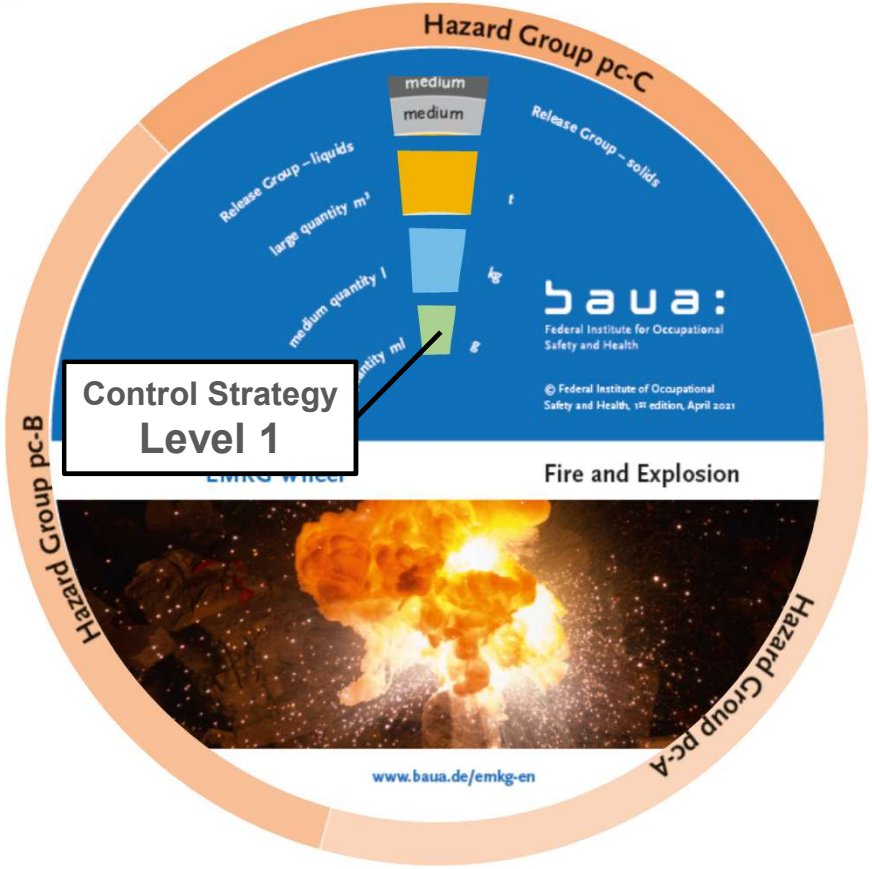
- Minimum standards = Control guidance sheets series 100
- Technical measures = Control guidance sheets series 200
- Closed system = Control guidance sheets series 300

* When dealing with solids, fire prevention measures are sufficient.

Hazard Group
pc-C
(H225)

Quantity Group
small
(50 ml)

Release Group
medium
(boiling point 82°C)



Need for measures: Fire and explosion

Control Strategy Level 1

Minimum standards

- General fire protection measures
- Control Guidance Sheet pc-170 General fire prevention measures - basic requirements

Control Strategy Level 2

Technical measures

- Advanced fire protection measures
- Preventive explosion protection
- Activity-specific avoidance of ignition sources
- Control Guidance Sheet series 200

Control Strategy Level 3

Closed system

- High fire protection measures
- System-/ activity-specific avoidance of ignition sources
- Constructive explosion protection
- Control Guidance Sheet series 300

Evaluation of Effectiveness of Protective Measures

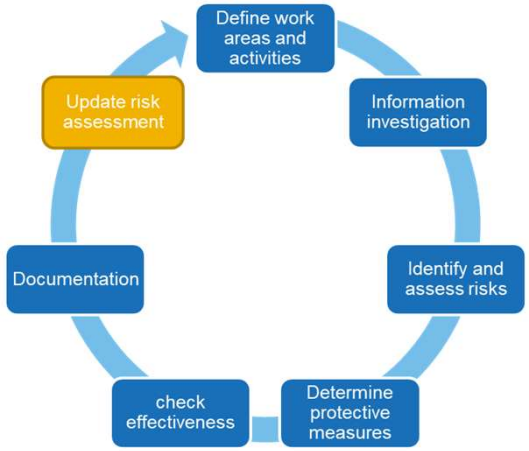
Finding: Protective measures are sufficient

- Deadlines are set for reviewing the effectiveness of protective measures
- **Minimum standards complied**
- Dust protection measures established
- Regular visual and functional check
- Metrological inspection of ventilation or technological parameters
  (at least every 3 years, dusts annually)
- **Sufficient time for the implementation of protective measures**
- PPE and skin products are used according to instruction
- Concentration measurement possibly required for unavoidable ignition sources
- Device testing by a qualified person

Images: www.pixabay.com

Updating the risk assessment

- **Introduction of new hazardous substances**
- **Change in activities or working conditions**
- **Results and findings from:**
  - checking the effectiveness of protective measures
  - Occupational health care
  - Accidents, illnesses, ...



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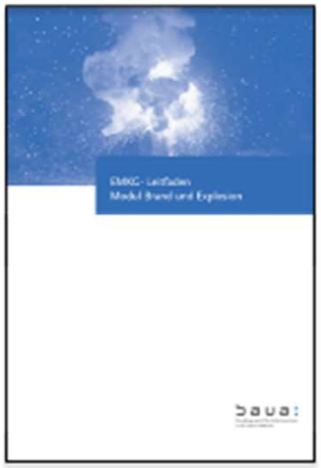
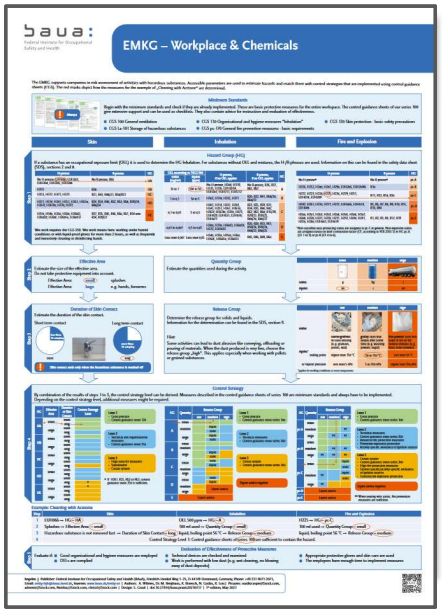
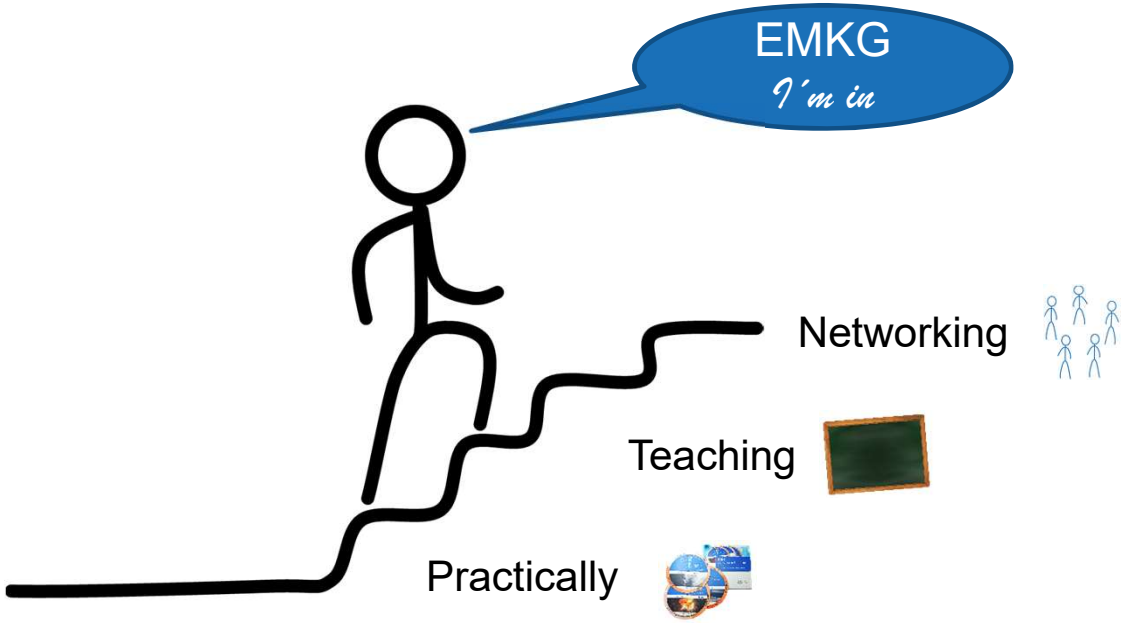




Get tips for your risk assessment with the EMKG on our homepage and keep up to date with news and dates with our EMKG-Newsletter!

www.baua.de/emkg-en

Thank you for your attention!



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