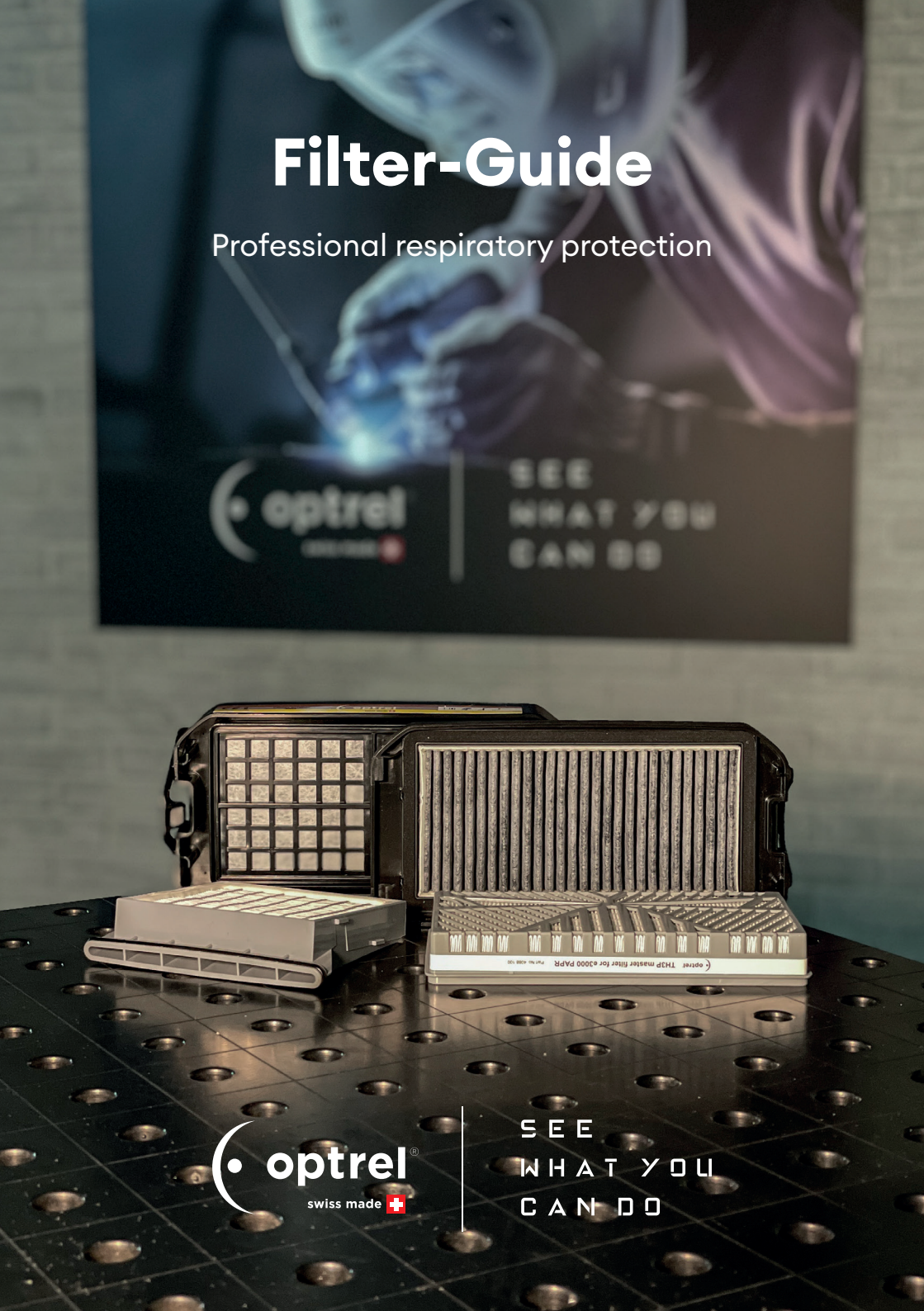
Filter-Guide

Professional respiratory protection



Guide to optrel filters

(All statements without guarantee)

This information is intended to provide an overview of the relevant factors that will help in the selection of a suitable filter. If you lack the necessary information and/or are not sure about your choice, consult a professional first.
Only with the right choice you can protect yourself from the health risks caused by pollutants in the ambient air.

1. information you need for a correct choose:

- Pollutants in the ambient air
- Concentration(s) of the pollutant(s)
- Aggregate state(s) of the pollutant(s) (gaseous, solid, as a mixture)
- Can the pollutants be detected without aids? (e.g. odor or taste)
- The valid limit values e.g. AGW, OEL, ...
- Oxygen content of the ambient air. There are locally different minimum concentrations apply (Germany at least 17 vol. %)
- Should respiratory protection be combined with other be combined? (head, eye or hearing protection)

3. selection of the suitable filter device
With the information from chapter 2, the necessary protection factor can be determined.

The following chart shows the protection factor of the optrel respiratory protection equipment is listed:

Device	Marking	Nominal protection factor
Particle filtering devices		
e3000X in combination with PAPR helmet panoramaxx series, sphere series, clearmaxx series	TH3P TH3 Gas filter class 1	500
swiss air	TH3P	500
e3000X in combination with PAPR clearmaxx und industrial hard hat	TH2P TH2 Gas filter class 1	50
e3000X in combination with PAPR panoramaxx series and industrial hard hat	TH1P TH1 Gas filter class 1	10

Chart 1 with protection factors of optrel equipment (Germany)

The NPF is derived from the maximum permissible leakage of the respective equipment.
This results in the mathematically determined maximum protective performance of the respiratory protective equipment.
According to the recommendation of BGR190 (Germany), the factor for maximum operational concentration is derived from the NPF with a safety margin.

The minimum necessary protection factor
This is calculated with the concentration and the limit value of the pollutant.
The occupational exposure limit (OEL) is the time-weighted average concentration of a substance in the air at the workplace at which acute or chronic damage to the health of employees is not to be expected.

Gas filtering devices

Device	Nominal protection factor
Full face mask with filter	2000

Please note that the performance of the nominal protection factor can only be achieved if the respirator is used and maintained correctly in accordance with the instructions for use. Any national or local guidelines to the contrary must be observed.

Example: Determination of the required protection factor

Contaminant: Aluminiumoxid
Concentration at the work place: 300mg/m^3
Occupational Exposure Limit: 4mg/m^3

$$\text{Minimum protection factor} = \frac{\text{concentration of hazardous substance}}{\text{Occupational Exposure Limit:}}$$

$$= \frac{300}{4}$$

$$= 75$$

If a contaminant is present in the air both as particles and as a gas, the calculation must be made separately for each form. The respirator with the higher protection factor is selected.

Indication of the concentrations
Gases: ppm (parts per million in 1m^3 air)
or mg/m^3 (= Weight of a substance in m^3 air)
Particle: mg/m^3 (= Weight of a substance in 1m^3 air)

Calculation of the maximum pollutant concentration for a respirator:

Max. contaminant concentration = factor max. input concentration x limit value

Example: Determination of the maximum pollutant concentration

Contaminant:	Hydrogenchlorid
Occupational Exposure Limit)	3 mg/m^3 ppm
Respiratory protection:	e3000X with clearmaxx PAPR and A1B1E1 Gas- and Partikelfilter

factor x limit value = maximum pollutant concentration

Factor for max. input concentration for e3000X with clearmaxx PAPR : 500

500 x 3 mg = 1500 mg/m^3 Hydrogenchlorid

Filter selection

For protection against particles and aerosols such as dust, smoke, fibers, microorganisms (e.g. spores/fungi, viruses, bacteria), a particle filter must be selected. For protection against gases, a gas filter must be selected according to the chart shows you EN 14387

Chart 2 : Filter color code

Color code	Filter type	Main protection application area
	AX[3)]	Gases and vapors of organic compounds, boiling point ≤ 65° C
	A[)]	Gases and vapors of organic compounds, boiling point > 65° C
	B	Anorganic gases and vapors, e.g. chlorine, hydrogen sulfide, hydrogen cyanide (hydrocyanic acid)
	E	Sulfur dioxide, hydrogen chloride
	K	Ammonia and organic ammonia
	CO[4)]	Carbon monoxide
	Hg[5)]	Mercury vapor
	NO[6)]	Nitrous gases including Nitric Oxide
	Reak-tor[7)]	Radioactive iodine including radioactive iodine methane
	P	Particle

[3)] AX filters may only be used in the condition in which they were delivered (fresh from the factory). Reuse and use against gas mixtures is absolutely prohibited.
[4)] CO filters may only be used once and must be disposed of after use. Instructions according to local guidelines must be followed.
[5)] Hg filters may only be used for a maximum of 50 hours according to EN 14387.
[6)] NO filters may only be used once and must be disposed of after use.
[7)] Reactor filters: Instructions according to local guidelines must be observed.

The filters differ by:

Capacity (gas filters) Efficiency (particle filters).

Chart 3 : Differentiation filter types

Filter type	Filter-class	Protection against	Maximum permissible Pollutant concentration
Gas-filter		Gases and Vapors	
		Capacity:	30 x limit value with half masks 400 x limit value with full masks, but maximum:
	1	small	0,1 vol. % (1000 ppm) [8)]
	2	medium	0,5 vol. % (5000 ppm) [8)]
	3	big	1,0 vol. % (10000 ppm) [8)]
Partic-lelfilter		Particle	
		Efficiency:	
	1	small	4 x Limit value [10)]
	2	medium	10 x Limit value with half masks 15 x Limit value with full face masks [10)]
	3	big	30 x Limit value with half masks/ 400 x limit value with full masks [10)]
Combi-nation filter		Gases, vapors, particles	
	1-P2 2-P2 3-P2 4-P2	Correspon-ding combi-nation of gas and particle filter	Corresponding combination values

[8)] Values taken from European Standard EN 14387
[9)] Values taken from EN 529:2005

Other national and local guidelines must be observed

Sample filtertype:

A1B1E1  (see chart 2)

Notes:

Never use a filter device...

- if the oxygen content in the ambient air is too low (be sure to observe local regulations, in Germany the limit is 17 vol.% O2)
- in containers, tanks, cellars without ventilation and other poorly ventilated rooms or containers
- in unknown environments (no known contaminants and concentrations) and in environments that are immediately dangerous to life or health (IDLH)
- In case of higher pollutant concentrations than the maximum permissible concentration and/or filter performance
- If the contaminant has no or low warning properties such as taste and odor. Examples: Ozone, aniline, benzene and carbon monoxide.

If you experience any physical change (pain, dizziness, discomfort, etc.) or sensory changes (taste, smell, etc.), leave the area immediately.
If the respirator is damaged during operation or you notice any damage (e.g., defective face seal) then leave the area immediately.
Damaged equipment may only be used again after it has been repaired, inspected and approved by trained personnel.

Filter lifetime

The lifetime depends on many factors and cannot be answered in a general way. The following have a major influence:

- The set air volume (air consumption)
- The concentration of pollutants
- The composition of the pollutants
- The humidity
- The temperature

In addition, observe national and local regulations as well as company-internal regulations.

You can recognize the end of use of a gas filter when a noticeable taste/odor occurs.
With the optrel „swiss air“ and „e3000X“ systems, an alarm warns you when the particle filter is at the end of its lifetime, but not for the end of lifetime of the gas filter.
When using particle filters in combination with gas filters, pay attention to both alarms.

On the following pages you will get an overview of pollutants.

Chart 4 : Examples of contaminants

Substanz	Substance
1,1,1-Trichlorethan	1,1,1-Trichloroethane Methyl chloroform
1,1,2,2-Tetrachlorethan	1,1,2,2-Tetrachloroethane
1,1,2-Trichlorethan	1,1,2-Trichloroethane
1,2 Dichlorbenzol	1,2-Dichlorobenzene ortho-dichlorobenzene; o-Dichlorobenzene; o-Dichloro-Benzol
1,2-Dibromethan	1,2-Dibromoethane Ethylene dibromide
1,2-Propandiol E 1520, Monopropylenglycol	2-Hydroxypropyl acrylate 2-Hydroxypropyl prop-2-enoate
1,4-Dioxan	1,4-Dioxane Dioxane; Diethylene dioxide; p-Dioxane; Diethylene ether
1-Butanol Haemostypiticum Revici	Butan-1-ol 1-Butanol; Propylcarbinol; n-Butanol; n-Butyl alcohol
1-Methoxy-2-propanol 1-Methoxypropan-2-ol (IUPAC), Propylenglycol-1-methylether, Methoxyisopropanol, Methoxypropylalkohol	1-Methoxypropan-2-ol 1-Methoxy-2-propanol; Propylene glycol monomethyl ether
1-Methoxypropylacetat-1	1-Methoxypropyl acetate 1-Methoxy-2-propanol acetate; PGMEA
1-Propanol, Propylalkohol, Propanol, Optal, Terosol, 1-Hydroxypropan	Ethylcarbinol, 1-Hydroxypropane, Propionic alcohol, Propionyl alcohol, Propionylol, Propyl alcohol, Propylic alcohol, Propylol
2-(2-Butoxyethoxy)-ethanol	2-(2-Butoxyethoxy)ethanol Diethylene Glycol Monobutyl Ether
2,3-Epoxy-1-propanol	Glycidol
2,4-Xylidin	2,4-Dimethylaniline
2-Butanol	Butan-2-ol 2-Butanol; sec-Butyl alcohol; Methyl ethyl carbinol

CAS-No.	Filtertype	P	A1B1E1
71-55-6	A		(X)
79-34-5	A		(X)
79-00-5	A		(X)
95-50-1	A		(X)
106-93-4	A		(X)
999-61-1	A		(X)
123-91-1	A		(X)
71-36-3	A		(X)
107-98-2	A		(X)
108-65-6	A		C
71-23-8	A		V
112-34-5	A		(X)
556-52-5	A		(X)
95-68-1	A		(X)
78-92-2	A		(X)

2-Butoxy-ethanol	2-Butoxyethanol Ethyleneglycol monobutylether
2-Butoxyethyl-acetat	2-Butoxyethyl acetate
2-Chlorethanol Ethylenchlorhydrin	2-Chloroethanol Ethylene chlorohydrin; 2-Chloroethyl alcohol
2-Cyanacrylsäuremethylester Methylcyanacrylat, MCA, 2-Cyan-2-propensäuremethylester	Methyl cyanoacrylate Mecrylate; Methyl 2-cyanoacrylate; Methyl 2-cyanoprop-2-enoate
2-Ethoxyethanol (Cellosolve)	2-Ethoxyethanol Ethylene glycol monoethyl ether; Glycol monoethyl ether
2-Ethoxyethylacetat	2-Ethoxyethyl acetate
2-Ethoxyethylacetat	2-Ethoxyethyl acetate Ethylene glycol monoethyl ether acetate
2-Heptanon Amylmethylketon, Methylamylketon, MAK, Heptan-2-on, Methylpentylketon	Heptan-2-one Methyl n-amyl ketone; n-Amyl methyl ketone; 2-Heptanone
2-Hexanon MBK	Hexan-2-one 2-Hexanone; Methyl butyl ketone
2-Methoxyethylacetat Methylglykolacetat, Ethylenglykolmonomethyletheracetat, 2-Methoxyethanolacetat, Glykolmonomethyletheracetat, EGMEA Essigsäure-2-methoxyethylester, 2-Methoxyethanolacetat, Methylcellosolveacetat, 1-Acetoxy-2-methoxy-ethan	2-Methoxyethyl acetate Ethylene glycol methyl ether acetate
2-Pentanon Pentan-2-on, Methylpropylketon	Pentan-2-one Methyl propyl ketone; 2-Pentanone; Ethyl acetone
2-sec-Butylphenol sec Butylphenol, 2-	2-sec-Butylphenol o-sec-Butylphenol; 2-butan-2-ylphenol

111-76-2	A		(X)
112-07-2	A		(X)
107-07-3	A		(X)
137-05-3	A		(X)
110-80-5	A		(X)
111-15-9	A		(X)
111-15-9	A		(X)
110-43-0	A		(X)
591-78-6	A		(X)
110-49-6	A		(X)
107-87-9	A		(X)
89-72-5	A		(X)

3-Heptanon Ethylbutylketon, Heptan-3-on, EBK	Heptan-3-one 3-Heptanone; Ethyl butyl ketone
3-Methoxy-Butylacetat	3-methoxybutyl acetate 3-methoxybutyl ethanoate acetic acid 3-methoxybutyl ester
3-Pentanon Pentan-3-on, Amylketon, Dimethylaceton, Diethylketon, Propionon, Propion, Metaceton, DEK	Pentan-3-one Diethyl ketone; Metacetone; Propione; 3-Pentanone; Ethyl propionyl
4-Methyl-2-pentanol Methylisobutylcarbinol, 4-Methyl-2-amylalkohol, 4-Methyl-2-pentylalkohol, 4-Methylpentan-2-ol	4-methylpentan-2-ol Methyl isobutyl carbinol; Methyl amyl alcohol
5-Methyl-2-hexanon 5-Methylhexan-2-on, MIAK, Isopentylmethylketon, Methylisoamylketon	5-Methylhexan-2-one 5-Methyl-2-hexanone; Methyl isoamyl ketone
5-Methylheptan-3-on Ethylamylketon; Amylethylketon; Ethylpentylketon	5-Methylheptan-3-one Ethyl amyl ketone; 5-Methyl-3-heptanone
Acetonitril	Acetonitrile Methylcyanide; Cyanomethane
Acrylamid	Acrylamide Propenamide; Acrylamide monomer; Prop-2-enamide, 2-propenamide
Acrylnitril	Acrylonitrile Prop-2-enentrile; Propenenitrile; Vinyl cyanide
Acrylsäure	Acrylic acid
Allylalkohol Prop-2-en-1-ol (IUPAC), Acrylalkohol, Acryloxidhydrat, 2-Propen-1-ol, Vinylcarbinol	Allyl alcohol 2-propen-1-ol; Vinyl carbinol
Aluminium	Aluminium metal - inhalable / respirable dust (powder)

106-35-4	A		(X)
4435-53-4	A		(X)
96-22-0	A		(X)
108-11-2	A		(X)
110-12-3	A		(X)
541-85-5	A		(X)
75-05-8	A		(X)
79-06-1	A, P		X
107-13-1	A		(X)
79-10-7	A		(X)
107-18-6	A		(X)
7429-90-5	P	X	

Aluminiumoxid (keine Fasern)	Emery - inhalable / respirable dust Corundum Alumina
Ameisensäure	Formic acid
Anilin	Aniline Aminobenzene; Phenylamine; Aniline oil; Benzenamine
Antimonwasserstoff	Antimony hydride (Stibine)
Arsenwasserstoff	Arsine Hydrogen arsenide; Arsenic trihydride; Arsane
Benzol	Benzene, Benzol; Cyclohexatriene
Benzoesäure, Benzencarbonsäure, BENZOIC ACID, Phenylameisensäure, Phenylmethansäure, Benzolcarbonsäure, Phenylcarbonsäure, Carboxybenzen, Monophenylmethansäure	Benzoic acid, Carboxybenzene, E210, Dracylic acid, Phenylmethanoic acid, BzOH
Beryllium -Verbindungen	Beryllium and beryllium compounds (as Be)
Bitumen, Dämpfe/Aerosole	Asphalt - petroleum fumes
Blausäure Cyanwasserstoff; Ameisensäurenitril, Cyanwasserstoffsäure, Formonitril, Hydrogencyanid, Acidum borussicum	Hydrogen cyanide Formic anammonide, Hydrocyanic acid, Prussic acid,. Methanenitrile, Formonitrile
Brom	Bromine Dibromine, Brom
Bromwasserstoff	Hydrogen bromide Hydrobromic acid; HBr; Bromane
Butanol, tert.-	2-Methylpropan-2-ol tert-Butyl alcohol; 2-Methyl-2-propanol; Trimethyl-carbinol
Butanon, Methylethylketon MEK s. Butanon	Butan-2-one Methyl ethyl ketone; 2-Butanone

1302-74-5	P	X	
64-18-6	E,B		X
62-53-3	A		(X)
7803-52-3	B		X
7784-42-1	B, P		X
71-43-2	A		(X)
65-85-0	P	X	
7440-41-7	P	X	
8052-42-4	A, P		X
74-90-8	B		X
7726-95-6	B		X
10035-10-6	E		X
75-65-0	A		(X)
78-93-3	A		(X)

Butylamin (n, sek, iso)	n-Butyl acrylate 2-Propenoic acid butyl ester; Butyl-2-propenoate; Butyl prop-2-enoate
Calciumhydroxid	Calcium hydroxide Hydrated lime; Caustic lime; Calcium dihydroxide; Slaked lime
Calciumoxid	Calcium oxide Quicklime; Pebble lime; Burnt lime
Chlor	Chlorine Molecular chlorine
Chlorameisensäureethylester Ethylchlormethanat, Ethylchlorformiat, Ethoxycarbonylchlorid	Ethyl chloroformate Ethyl carbonochloridate
Chlorameisensäure-n-butylester	n-Butyl chloroformate Butyl carbonochloridate
Chlorbenzol	Chlorobenzene Monochlorobenzene; Chlorobenzol; Phenyl chloride
Chloressigsäure	Monochloroacetic acid Chloroethanoic acid; 2-chloroacetic acid
Chrom (Schleifanwendung)	Chromium (grinding)
Chrom und Legierungen mit Chrom (Schweissen o.ä.) Empfehlung	Chromium and alloys (welding) recommendation
Chrom(III)-Verbindungen	Chromium (III) compounds
Chrom(VI)-Verbindungen, Chromate (fest)	Chromium (VI) compounds, chromates (solid)
Chrom(VI) Chromhexacarbonyl (gasförmig)	Chromium (VI) Chromium hexacarbonyl (gas)
Cumol (Propan-2-yl)benzen (IUPAC), Isopropylbenzol, 2-Phenylpropan, Cumenylwasserstoff, Cumen, Retinyl, (1-Methylethyl)benzol	Cumene Isopropyl benzene; 2-Phenyl propane; Cumol
Cyclohexan	Cyclohexane

141-32-2	A		(X)
1305-62-0	P	X	
1305-78-8	P	X	
7782-50-5	B		X
541-41-3	A		(X)
592-34-7	A		(X)
108-90-7	A		(X)
79-11-8	E		X
7440-47-3	P	X	
	A, P		X
1308-38-9	P	X	
1333-82-0	P	X	
13007-92-6	A		X
98-82-8	A		(X)
110-82-7	A		(X)

Cyclohexan Hexahydrobenzol, Hexamethylen, Naphthen	Cyclohexane Hexahydrobenzene; Hexamethylene
Cyclohexanol	Cyclohexanol Hexalin; Hydralin; Hexahydrophenol; Hydroxycyclohexane; Anol; Cyclohexyl alcohol
Cyclohexanon	Cyclohexanone Pimelic ketone; Cyclohexyl ketone
Diacetonalkohol	4-Hydroxy-4-methylpentan-2-one Diacetone; Diacetone alcohol; 2-Methyl-2-pentanol-4-one
Diethylenglycol	2,2‘-Oxydiethanol Diethylene glycol; DEG; Diglycol; 2,2‘-Dihydroxydiethyl ether
Diethylenglycolmonomethylether	2-(2-Methoxyethoxy) ethanol
Diisobutylketon 2,6-Dimethylheptan-4-on	2,6-Dimethylheptan-4-one Diisobutyl ketone; 2,6-Dimenthyl-4-heptanone; sym-Diisopropylacetone; Isovalerone; Valerone
Di-isopropylether	Diisopropyl ether Isopropyl ether
Dimethylformamid (DMF)	N,N-Dimethylformamide Dimethylformamide; DMF
Dimethylnitrosamin	N,N-dimethylnitrous amide
Dimethylsulfat	Dimethyl sulphateulfuric acid dimethyl ester
Dipropylenglykolmonomethylether	(2-methyoxyethylethoxy) propanol Dipropylene glycol methyl ether; Dipropylene glycol monomethyl ether; DowanolTM50B
Dischwefeldichlorid	Disulphur dichloride Sulphur monochloride; Sulphur chloride; Sulphur subchloride
Essigsäure	Acetic acid Glacial acetic acid

110-82-7	A		(X)
108-93-0	A		(X)
108-94-1	A		(X)
123-42-2	A		(X)
111-46-6	A		(X)
111-77-3	A		(X)
108-83-8	A		(X)
108-20-3	A		(X)
68-12-2	A		(X)
62-75-9	A(B)(P3)		X
77-78-1	A, P		X
34590-94-8	A		(X)
10025-67-9	B		X
64-19-7	E(A,B)		X

Essigsäureanhydrid Acetanhydrid, Ac2O, Ethansäureanhydrid	Acetic anhydride Ethanoic anhydride; Acetic acid anhydride; Acetyl oxide; Acetyl acetate
Essigsäureisopropylester Isopropylacetat, i-Propylacetat	Isopropyl acetate Isopropyl ester of acetic acid; sec-Propyl acetate; Propan-2-yl acetate
Essigsäure-n-butylester Butylacetat, Butylethanoat, n-Butylacetat	Butyl acetate n-Butyl acetate; Butyl ethanoate; Acetic acid butyl ester
Essigsäure-n-propylester n-Propylacetat, n-Propylethanoat	n-Propyl acetate Propylacetate; Acetic acid n-propyl ester
Essigsäure-tert-butylester 1,1-Dimethylethylethanoat, tert-Butylacetat	Tert-Butyl acetate Acetic acid tert-butyl ester
Ethylethoxypropionat	Ethyl 3-ethoxypropionate
Ethanol	Ethanol Ethyl alcohol
Ethylacetat	Ethyl acetate Acetic acid ethyl ester; Ethyl ethanoate
Ethylacrylat	Ethyl acrylate Acrylic acide ethyl ester; Ethyl prop-2-enoate
Ethylbenzol	Ethylbenzene Phenylethane; Ethylbenzol
Ethylenglycolmonobutylether, 2-Butoxyethan-1-ol, Butylglycol, 1-Butoxy-2-hydroxyethan, Ethylenglycolbutylether, EGBE, BG	2-Butoxyethanol, Butyl cellosolve, Butyl glycol, Butyl monoether glycol, EGBE (ethylene glycol monobutyl ether), EGMBE, Butyl oxitol, Ektasolve, Jeffersol EB
Ethylenglycol Ethan-1,2-diol (IUPAC), Ethylenglykol (EG), Äthylenglycol/-glykol, Monoethylenglycol/-glykol, Ethandiol, 1,2-Dihydroxyethan, 1,2-Ethandiol, Ethylenalkohol, Ethylenoxidhydrat, Glycol/Glykol, Genantin, Glysantin	Ethane-1-2-diol - particulate or vapour Ethylene glycol; Ethylene alcohol; Glycol; 1,2-Ethanediol

108-24-7	A		(X)
108-21-4	A		(X)
123-86-4	A		(X)
109-60-4	A		(X)
540-88-5	A		(X)
763-69-9	A		(X)
64-17-5	A		(X)
141-78-6	A		(X)
140-88-5	A		(X)
100-41-4	A		(X)
111-76-2	A		
107-21-1	A, P		X

Fluor	Fluorine Molecular fluorine
Fluorwasserstoff, Flußsäure	Hydrogen fluoride Fluorane; Fluoric acid; HF
Furfural Furan-2-aldehyd, Fural, Furan-2-carbaldehyd, Furancarbonal, 2-Formylfuran, Furfurol	2-Furaldehyde Furfuraldehyde; Fural; 2-Furancarboxaldehyde; Furfural; Furan-2-carbaldehyde
Heptan	n-Heptane Normal heptane; Heptane
Hexylenglycol 2-Methyl-2,4-pentandiol, 2-Methylpentan-2,4-diol	2-Methylpentane-2,4 diol 4-Methyl-2,4-pentanediol; Hexylene glycol
Inden Indonaphthen Benzocyclopentadien	Indene Indonaphthene; 1H-indene
Iso-Amylalkohol	3-Methylbutan-1-ol Isoamyl alcohol; Isobutyl carbinol; Isopentyl alcohol; Fusel oil; 3-Methyl-1-butanol
Isobutanol	2-Methylpropan-1-ol Isobutyl alcohol; Isobutanol; 2-Methyl-1-propanol; Isopropylcarbinol
Isophoron	3,5,5-Trimethylcyclohex-2-enone 3,5,5-Trimethyl-cyclohexenone; Isophorone
Isopropanol, 2-Propanol	Propan-2-ol Isopropyl alcohol; Isopropanol; 2-Propanol; sec-Propyl alcohol
Kohlendisulfid	Carbon disulphide Carbon bisulphide
Kresol	Cresol (mixture of isomers)
Kupfer	Copper fume (as Cu), Copper and compounds dust and mists (as Cu)
Magnesiumoxid	Magnesium oxide (as Mg) - inhalable dust fume and total respirable dust Magnesia fume; Oxomagnesium

7782-41-4	B		X
7664-39-3	E, B		X
98-01-1	A		(X)
142-82-5	A		(X)
107-41-5	A		(X)
95-13-6	A		(X)
123-51-3	A		(X)
78-83-1	A		(X)
78-59-1	A, P		X
67-63-0	A		(X)
75-15-0	B		X
1319-77-3	A		(X)
7440-50-8	P2	X	
1309-48-4	P1	X	

Maleinsäureanhydrid, (Z)-Butendisäureanhydrid, cis-Butendisäureanhydrid, cis-Ethylendicarbonsäure-anhydrid, 2,5-Furandion, 2,5-Dioxo-dihydrotetrafuran. Dihydro-2,5-dioxofuran, MSA	Maleic anhydride, cis-Butenedioic anhydride, 2,5-Furanedione, Maleic acid anhydride, Toxilic anhydride
Mesitylen, 1,3,5-Trimethylbenzol, sym-Trimethylbenzol	Mesitylene, sym-Trimethylbenzene
Methoxyethanol Me-Glycol	2-Methoxyethanol Ethylene glycol monomethyl ether
Methylacrylat	Methyl acrylate Methyl propenoate; Methyl prop-2-enoate
Methylcyclohexanol	Methylcyclohexanols - mixture of isomers
Methylisobutylketon MIBK	4-Methylpentan-2-one Methyl isobutyl ketone; Hexone
Methyl-methacrylat	Methyl methacrylate ethyl 2-methylprop-2-enoate
Monoethanolamin 2-Aminoethan-1-ol (IUPAC), Ethanolamin (vereinfacht), Aminoethanol, Colamin, Olamin (INN), beta-Hydroxyethylamin	2-Aminoethanol Ethanolamine; Ethylolamine; 2- Hydroxethylamine Monoethanolamine
Morpholin Diethylenoximid, Tetrahydro-1,4-oxazin, Tetrahydro-p-oxazin, 1,4-Oxazinan, Diethylenimidoxid, 1-Oxa-4-azacyclohexan	Morpholine Tetrahydro-1,4-oxazine; Diethylenimide oxide
MTBE Methyl-tert-butylether, 2-Methoxy-2-methylpropan (IUPAC), tert-Butylmethylether, tBME, Methyl-tertiär-butylether	Methyl-tert-butyl-ether 2-Methoxy-2-methyl-propane; tert-Butyl methyl ether; MTBE
m-Xylol	Dimethylbenzenes

108-31-6	A		(X)
108-67-8	A		(X)
109-86-4	A		(X)
96-33-3	A		(X)
25639-42-3	A		(X)
108-10-1	A		(X)
80-62-6	A		(X)
141-43-5	A		(X)
110-91-8	A		(X)
1634-04-4	A		(X)
1330-20-7	A		(X)

N,N-Dimethylanilin Dimethylaminobenzol, Dimethyl-phenyl-amin	N,N-Dimethylaniline Dimethylaniline
Natriumhydroxid, Natronlauge	Sodium hydroxide Caustic soda; Soda lye; Lye (Sodium hydroxide)
n-Hexan	n-Hexane Hexane; Hexyl hydride; Normal hexane
o-Toluidin	o-Toluidine o-Aminotoluene; o-Methylaniline; 2-Methylaniline
Oxalsäure	Oxalic acid Ethanedioic acid
para-Toluolsulfonsäurechlorid Toluol-4-sulfonylchlorid, Toluol-4-sulfonsäurechlorid, 4-Methylbenzol-1-sulfonylchlorid, p-Toluolsulfochlorid, Tosylchlorid, p-Toluolsulfonylchlorid, Toluol-4-sulfochlorid, TosCl, TsCl	p-Toluenesulphonyl chloride 4-Methyl-benzenesulfonyl chloride; Tosyl chloride
Phenol	Phenol Carbolic acid; Monohydroxy benzene
Phosgen, Carbonylchlorid	Phosgene Carbonyl chloride; Carbon oxychloride; Chloroformyl chloride; Carbonyl dichloride
Phosphortrichlorid	Phosphorus trichloride Phosphorus chloride; Trichlorophosphane
Phosphorwasserstoff, (Phosphin)	Phosphine Hydrogen phosphide; Phosphorus hydride; Phosphorated hydrogen; Phosphane
Polyvinylchlorid (PVC)	Polyvinyl chloride - inhalable / respirable dust
Propionsäure	Propionic acid Methylacetic acid; Ethylformic acid; Propanoic acid

121-69-7	A		(X)
1310-73-2	P	X	
110-54-3	A		(X)
95-53-4	A		(X)
144-62-7	P	X	
98-59-9	B		X
108-95-2	A, P		X
75-44-5	B		X
7719-12-2	B, E, P		X
7803-51-2	B		X
9002-86-2	P	X	
79-09-4	A		(X)

Pseudocumol, 1,2,4-Trimethylbenzol, asym.-Trimethylbenzo	1,2,4-Trimethylbenzene, Pseudocumene, Asymmetrical trimethylbenzene, psi-cumene
Pyridin	Pyridine Azabenzene; Azine
Salzsäure Chlorwasserstoffsäure, Acidum hydrochloricum	Hydrogen chloride (gas and aerosol mists) Hydrochloric acid; HCl; Muriatic Acid; Chlorane
Schwefeldioxid	Sulfur dioxide
Schwefelwasserstoff	Hydrogen sulphide Sulfane; H2S; Hydrosulphuric Acid
Siliciumcarbid	Silicon carbide (not whiskers) - total inhalable / respirable dust Carbon silicide; Carborundum
Solvent Naphtha, Lösungsbenzol, Schwerbenzol, Leichtöl-Redestillat	Solvent Naphtha
Styrol	Styrene Phenylethylene; Vinyl benzene; Cinnamene; Styrene monomer
Terpentinöl	Turpentine Gum spirits; Turps; Wood turpentine; Gum turpentine
Tetrachlor-difluorethan (R 112)	
Tetrachlorethylen	Tetrachloroethylene Perchloroethylene; Perk
Tetrachlormethan	Carbon tetrachloride Tetrachloromethane; Perchlormethane
Tetrahydrofuran (THF)	Tetrahydrofuran THF; 1,2-Epoxybutane; 1,2-Butylene oxide Epoxy-butane; Oxolane
Titan(IV)-oxid Titandioxid, Titansäureanhydrid	Titanium dioxide - total inhalable / respirable dust Rutile; Anatase; Brookite
Toluol	Toluene Toluol; Phenyl methane; Methyl benzene

95-63-6	A		(X)
110-86-1	A		(X)
7647-01-0	E		X
7446-09-5	E		X
7783-06-4	B		X
409-21-2	P	X	
64742-95-6	A		(X)
100-42-5	A		(X)
8006-64-2	A		(X)
76-12-0	A		(X)
127-18-4	A		(X)
56-23-5	A		(X)
109-99-9	A		(X)
13463-67-7	A		(X)
108-88-3	A		(X)

Trichlorethylen (Tri)	Trichloroethylene Ethylene trichloride; Triclene™
Vanadiumpentoxid	Vanadium pentoxide Divanadium pentoxide; Vanadic anhydride; Vanadium oxide; Vanadium(V) oxide
Vinylacetat	Vinyl acetate 1-Acetoxyethylene; Ethenyl acetate
Xylol (alle Isomere)	Xylene (all isomers)

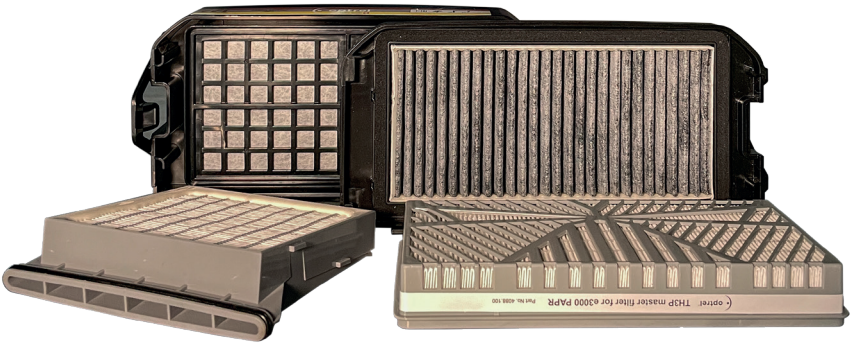
Notizen:

79-01-6	A		(X)
1314-62-1	P	X	
108-05-4	A		(X)
1330-20-7	A		(X)

Notizen:

Notizen:

Notizen:



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