

Filters for Respiratory Protection

[Alphabetical List of Industrial Gases and Toxic Substances]

This overview of industrial gases and toxic substances guides you in selecting the appropriated performance type and the adequate filter. Before using respiratory protection, please read the pertinent instructions for use.

Respiratory filters have been designed to protect against numerous known contaminants, which, if inhaled, can be dangerous to health: toxic gases, vapours and particles as well as many combinations with immediate or delayed harmful effects.

Limitation of use: filters for respiratory protection may be used everywhere, except for some inherent limitation e.g. containers or confined spaces. Principally, the following conditions must be known:

- Type, property and composition of contaminant
- Oxygen content of the inhalation air must be sufficient [> 17 vol.-%]
- Local or national restrictions or conditions should be observed

For all gases and vapors which may be present in combination with particles [dust, smokes, mist, spray] a combined filter [protection from gases and particles] must be used.

The filter recommendations are based on pure substances. With mixtures, by-products, or decomposition products, the impurities must be taken into account. For compounds with a boiling point below 65°C , AX Filters must be used.

If the above list mentions a particle filter [e.g. A-P2] for a specific substance, particles are commonly found with the gas or vapor.

For information on other substances, please contact one of our MSA subsidiaries.

Substances	Formula	Filter Performance Type	Code color	Remarks
A Acetaldehyde	CH_3CHO	AX	brown	87 AX
Acetic acid	CH_3COOH	E	yellow	also B or A
Acetone	CH_3COCH_3	AX	brown	87 AX
Acetonecyanhydrin	$\text{CH}_3\text{C}[\text{OH}][\text{CN}]\text{CH}_3$	A-[P3]	brown-[white]	¹⁾
Acetonitrile	CH_3CN	A	brown	in presence of hydrogen cyanide: B
Acidic gases	-	E	yellow	also B
Acids [fuming concentrated]	-	E-[P2]	yellow-[white]	¹⁾
Acrolein [2-Propenal]	CH_2CHCHO	AX	brown	87 AX
Acrylic acid-esters	CH_2CHCOOR	A	brown	¹⁾
Acrylonitrile	CH_2CHCN	A-[P3]	brown-[white]	in presence of hydrogen cyanide: B-P3
Alcohols	$\text{R} \cdot \text{OH}$	A	brown	methyl alcohol: AX
Aldehydes	$\text{R} \cdot \text{CHO}$	A or AX	brown	formaldehyde: filter B
Allylchloride				
[3-chloride-1-propen]	$\text{CH}_2\text{CHCH}_2\text{Cl}$	AX	brown	87 AX
2-Amino ethanol	$\text{CH}_2\text{OHCH}_2\text{NH}_2$	A	brown	¹⁾
Ammonia	NH_3	K	green	¹⁾
Aniline	$\text{C}_6\text{H}_5\text{NH}_2$	A-[P3]	brown-[white]	¹⁾
Aqueous ammonia	$\text{NH}_3\text{H}_2\text{O}$	K	green	¹⁾
Arsenic trioxide	As_2O_3	P3	white	in presence of arsine: 89 B/St [B2-P3]
Arsine	AsH_3	B	grey	in presence of arsenides: 89 B/St [B2-P3]

¹⁾ All filters of the indicated performance type could be used, see leaflet "MSA Respiratory filters", ID 05-100.2.

Substances	Formula	Filter Performance Type	Code color	Remarks
B Benzene	C ₆ H ₆	A	brown	1]
Benzyl bromide	C ₆ H ₅ CH ₂ Br	A-[P2]	brown-[white]	also B
Beryllium	Be	P3	white	1]
Bromine	Br ₂	B-[P3]	grey-[white]	1]
Bromoform	CHBr ₃	A	brown	1]
Bromomethane	CH ₃ Br	AX	brown	87 AX
Butanone	CH ₃ COC ₂ H ₅	A	brown	1]
Butyl acetate	CH ₃ COOC ₄ H ₉	A	brown	1]
Butyl acrylate	CH ₂ CHCOOC ₄ H ₉	A	brown	1]
Butyl alcohols [butanols]	C ₄ H ₉ OH	A	brown	1]
C Carbon black	C	P2	white	1]
Carbon dioxide	CO ₂	2]	-	self-contained BA
Carbon disulfide	CS ₂	B	grey	1]
Carbon monoxide	CO	CO	black	CO filter canister, CO filter cartridge
Carbon oxysulfide	COS	B	grey	1]
Carbon tetrachloride	CCl ₄	A	brown	1]
Caustic soda	NaOH	P2	white	1]
Chlorobromomethane	CH ₂ ClBr	AX	brown	87 AX
Chlorine	Cl ₂	B-[P3]	grey-[white]	1]
Chlorine dioxide	ClO ₂	B	grey	1]
Chloromethane	CH ₃ Cl	2]	-	self-contained BA
Chloroform	CHCl ₃	AX	brown	87 AX
Chloroprene	CH ₂ C[C]CHCH ₂	AX	brown	87 AX
Chlorosulfonic acid	ClSO ₃ H	B-[P2]	grey-[white]	also E-P2
Chromium oxide	Cr ₂ O ₃ , CrO ₃	P3	white	1]
Cresols	-	A	brown	1]
Cyanogen chloride	ClCN	B	grey	89 B/St
Cyclohexane	C ₆ H ₁₂	A	brown	1]
Cyclohexanol	C ₆ H ₁₁ OH	A	brown	1]
Cyclohexanone	C ₆ H ₁₀ O	A	brown	1]
D DD-products				
[Desmodur-Desmophen]	-	A-[P2]	brown-[white]	1]
DDT dust	-	P3	white	also 89 B/St
Diacetonel alcohol	[CH ₃] ₂ C[OH]CH ₂ COCH ₃	A	brown	1]
1,2-Dibromoethane	CH ₂ BrCH ₂ Br	A	brown	1]
1,2-Dichloroethane	CH ₂ ClCH ₂ Cl	A	brown	1]
1,2-Dichloroethylene	CHClCHCl	AX	brown	87 AX
Dichloromethane	CH ₂ Cl ₂	AX	brown	87 AX
1,2-Dichloropropane	C ₃ H ₆ Cl ₂	A	brown	1]
Diesel fuel	-	A	brown	1]
Dimethylformamide [DMF]	HCON[CH ₃] ₂	A	brown	1]
1,4-Dioxane	C ₄ H ₈ O ₂	A	brown	1]
Dust	-	P2, P3	white	1]
E Epichlorhydrin	C ₃ H ₅ OCl	A-[P3]	brown-[white]	1]
Esters	R-COOR	A or AX	brown	1]
Ethanolamine	CH ₂ OHCH ₂ NH ₂	A	brown	1]
Ethers	ROR	A or AX	brown	1]
Ethyl acetate	CH ₃ COOC ₂ H ₅	A	brown	1]
Ethyl alcohol [ethanol]	C ₂ H ₅ OH	A	brown	1]
Ethyl benzene	C ₆ H ₅ CH ₂ CH ₃	A	brown	1]
Ethylene chloride	CH ₂ ClCH ₂ Cl	A	brown	1]
Ethylene dichloride	CH ₂ ClCH ₂ Cl	A	brown	1]
Ethylene oxide [T-gas]	C ₂ H ₄ O	AX	brown	87 AX
Ethyl formate	HCOOC ₂ H ₅	AX	brown	87 AX
F Formaldehyde [formalin]	HCHO	B-[P3]	grey-[white]	1]
Formic acid	HCOOH	E	yellow	also B
Furfuryl alcohol	C ₅ H ₄ O ₂	A	brown	1]
G Gasoline	-	A	brown	1]

¹⁾All filters of the indicated performance type could be used, see leaflet "MSA Respiratory filters", ID 05-100.2.

²⁾Protection against specified substances should be reached by using self-contained respiratory protection [compressed air breathing apparatus or air line breathing apparatus].

Substances	Formula	Filter Performance Type	Code color	Remarks
H Halogenated hydrocarbons	R-Hal	A or AX B-[P2] or B-[P3]	brown grey-[white] grey-[white]	no filter for chloromethane if they produce HCl/H ₂ O
Halogens	Hal ₂	B	grey	¹⁾
Hexachlorocyclohexane	C ₆ H ₆ Cl ₆	A-[P3]	brown-[white]	also 89 B/St
Hydrazine	N ₂ H ₄	K-[P3]	green-[white]	¹⁾
Hydrocarbons	R-H	A	brown	¹⁾
Hydrochlorid acid	HCl/H ₂ O	E-[P2]	yellow-[white]	also B-P2
Hydrofluoric acid [hydrogen fluoride]	HF/H ₂ O	E	yellow	also B
Hydrogen bromide	HBr	E-[P2]	yellow-[white]	also B
Hydrogen chloride	HCl	E-[P2]	yellow-[white]	also B
Hydrogen cyanide	HCN	B	grey	¹⁾
Hydrogen halogenides	HF, HCl, HBr, HI	E-[P2]	yellow-[white]	also B-P2
Hydrogen selenide	H ₂ Se	B-[P2]	grey-[white]	¹⁾
Hydrogen sulfide	H ₂ S	B	grey	¹⁾
I Insecticide [organic]	-	A-[P2]	brown-[white]	¹⁾
Iodine	J ₂	B-[P2]	grey-[white]	also A-P2
Iodine [radioactive]	J ₂	Reactor-[P3]	orange-[white]	¹⁾
Iodomethane	CH ₃ I	AX	brown	87 AX
Iodomethane [radioactive]	CH ₃ I	Reactor-[P3]	orange-[white]	¹⁾
Iron pentacarbonyl	Fe[CO ₅]	CO-[P3]	black-[white]	CO filter canister with particle filter P3
Isocyanates [organic]	R-NCO	B-[P2]	grey-[white]	in case of spray and propellent gas
Isopropyl alcohol	CH ₃ CH[OH]CH ₃	B A	grey brown	if vapors only are present ¹⁾
K Ketenes	R-CH ₂ =CO	²⁾	-	self-contained BA
Ketones	R-CO-R	A	brown	Acetone: AX
L Lead fumes	Pb	P2	white	¹⁾
M Maleic anhydride	C ₄ H ₂ O ₃	A-[P2]	brown-[white]	¹⁾
Mercaptans	R-SH	B	grey	¹⁾
Mercury compounds	-	Hg-[P3]	red-[white]	89 Hg/St
Mercury vapour	Hg	Hg-[P3]	red-[white]	89 Hg/St
Metal fumes	-	P2, P3	white	¹⁾
Methyl alcohol [methanol]	CH ₃ OH	AX	brown	87 AX
Methyl bromide	CH ₂ Br	AX	brown	87 AX
Methyl chloride	CH ₃ Cl	²⁾	-	self-contained BA
Methyl chloroform	CH ₃ CCl ₃	A	brown	¹⁾
Methylene chloride	CH ₂ Cl ₂	AX	brown	87 AX
Methyl ethyl ketone [MEK]	CH ₃ COC ₂ H ₅	A	brown	¹⁾
Methyl isobutyl ketone [MIBK]	CH ₃ COC ₄ H ₉	A	brown	¹⁾
N Nickel tetracarbonyl	Ni[CO] ₄	CO-[P3]	black-[white]	CO filter canister and particle filter P3
Nitric acid	HNO ₃ /H ₂ O	NO	blue	89 NO/St
Nitro compounds [organic]	R-NO ₂	A	brown	¹⁾
Nitrogen oxides	NO, NO ₂ , N ₂ O ₅	NO	blue	89 NO/St
Nitrous fumes	NO, NO ₂ , N ₂ O ₅ , HNO ₂ , HNO ₃	NO	blue	89 NO/St
O Organic nitro compounds	R-NO ₂	A	brown	¹⁾
Organic vapors, solvent	-	A, AX	brown	¹⁾
Ozone	O ₃	CO NO	black blue	CO filter canister 89 NO/St

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Substances	Formula	Filter Performance Type	Code color	Remarks
P Paint sprays, vapors	–	A–[P2]	brown–[white]	1)
Pentachloroethane	CHCl ₂ CCl ₃	A	brown	1)
Perchloroethylene	CCl ₂ CCl ₂	A	brown	1)
Pesticides	–	A–[P2]	brown–[white]	1)
Petrol	–	A	brown	1)
Phenols	–	A	brown	1)
Phenylhydrazine	C ₆ H ₅ NHNH ₂	A	brown	also K
Phosgene	COCl ₂	B	grey	1)
Phosphine	PH ₃	B	grey	1)
Phosphorus trichloride	PCl ₃	B–[P2]	grey–[white]	1)
Polyacrylates	–	A–[P2]	brown–[white]	1)
Potassium cyanide [dust]	KCN	B–[P3]	grey–[white]	1)
Propyl alcohol [propanol]	CH ₃ CH ₂ CH ₂ OH	A	brown	1)
Pyridine	C ₅ H ₅ N	A	brown	also K
Q Quartz	SiO ₂	P2	white	1)
S Sodium hydroxide	NaOH	P2	white	1)
Solvents	–	A	brown	1)
Stibine	SbH ₃	B–[P3]	grey–[white]	1)
Styrene	C ₆ H ₅ CHCH ₂	A	brown	1)
Sulfur compounds [burning]	[SO ₂]	E–[P2]	yellow–[white]	1)
Sulfur dioxide	SO ₂	E	yellow	1)
Sulfuric acid	H ₂ SO ₄	B–[P2]	grey–[white]	1)
Sulfur monochloride	S ₂ Cl ₂	B–[P2]	grey–[white]	1)
Sulfur trioxide	[SO ₃]	P2	white	1)
Sulfuryl chloride	SO ₂ Cl ₂	B	grey	1)
T 1,1,2,2-Tetrachloroethane	CHCl ₂ CHCl ₂	A	brown	1)
Tetrachloroethylene	CCl ₂ CCl ₂	A	brown	1)
Tetrachloromethane	CCl ₄	A	brown	1)
Tetrahydrofuran	C ₄ H ₈ O	A	brown	1)
T-gas [ethylene oxide]	[C ₂ H ₄ O]	AX	brown	87 AX
Toluene	C ₆ H ₅ ·CH ₃	A	brown	1)
Tribromomethane	CHBr ₃	A	brown	1)
Trichloroethane [TCA]	CH ₃ CCl ₃	A	brown	1)
Trichloroethylene [Tri]	C ₂ HCl ₃	A	brown	1)
Trichloromethane	CHCl ₃	AX	brown	87 AX
Turpentine	–	A	brown	1)
V Vanadium pentoxide dust, fumes	V ₂ O ₅	P2	white	1)
Vinyl acetate	C ₄ H ₆ O ₂	A	brown	1)
Vinyl chloride	CH ₂ CHCl	AX	brown	87 AX
Vinylidene chloride	CH ₂ CCl ₂	AX	brown	87 AX
Vinyltoluene	CH ₃ C ₆ H ₄ CHCH ₂	A	brown	1)
X Xylenes	CH ₃ C ₆ H ₄ CH ₃	A	brown	1)
Z Zinc oxide	ZnO	P2	white	1)
Zyklon [hydrogen cyanide with irritant]	–	B	grey	1)

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