

# HAZCHEM RESPONSE

## STS FILTER SELECTION

### GUIDE



## CAUTION

The efficacy of respiratory protection filters is dependent on the ambient atmosphere.

Do not use in the following environments or situations:

- Oxygen deficient atmosphere, i.e. < 19.5%. (STS definition. Individual countries may apply their own limits on oxygen deficiency)
- Oxygen only or oxygen-enriched atmosphere.
- Type, properties, concentration and composition of the hazardous agent is unknown.
- Concentrations of contaminants are immediately dangerous to life or health (IDLH).
- Confined spaces or any closed chambers such as containers, due to poor ventilation,.
- Atmosphere with mixed chemical substances (except for multi-gas filter, e.g. ABEK1 filter)
- Filters that show signs of damage.
- Gases, vapours and particles which cannot be removed by filter
- Environment where there is a possibility of explosion.

When using a particle filter, no hazardous gases may be present in the ambient air, when using a gas filter no hazardous particles. In case of doubt a combined filter must be used.

If you are in doubt concerning any of the points mentioned above, or if you believe the composition of your atmosphere at work has changed, use respiratory device that operates independently of the ambient air (e.g. SCBA, airline devices).

The following extract of industrial gases and toxic substances will guide you in making the correct choice of respiratory device and filter. In any case, final choice and use of filtering devices remain the responsibility of the user.

Always read the instructions provided with every device before use.

## HOW TO READ THIS GUIDE

In case there are two kinds of recommended filters:

- indicates "Strongly Recommended"
- indicates "Recommended"

In case there is only one kind of recommended filter:

- only this is used.

Particle Filters which are intended to be used individually are marked with P3R or P2R. For those used in combination with a gas filter, they are marked with P3RC and P2RC.



⊙ : Highly Recommended ○ : Recommended

Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
		Gas Filter					
		A	K	ABEK	AX		
<b>A</b>							
1 Acetaldehyde	75-07-0				○		
2 Acetamide	60-35-5					P3R	
3 Acetic acid	64-19-7	⊙		○		P2RC	
4 Acetic anhydride	108-24-7	⊙		○			
5 Acetone	67-64-1				○		
6 Acetone cyanohydrine	75-86-5	⊙		○			
7 Acetonitrile	75-05-8	⊙		○			
8 Acetylene	74-86-2						○
9 Acetyl chloride	75-36-5			○		P2RC	
10 o-Acetylsalicylic acid	50-78-2					P2R	
11 Acrolein	107-02-8				○		
12 Acrylamide	79-06-1					P3R	
13 Acrylic acid	79-10-7	⊙		○		P2RC	
14 Acrylonitrile	107-13-1	⊙		○			
15 Aldrin	309-00-2					P3R	
16 Allyl alcohol	107-18-6	⊙		○			
17 Allylamine	107-11-9	⊙		○			
18 Allyl bromide	106-95-6	⊙		○			
19 Allyl chloride	107-05-1				○		
20 Allyl glycidyl ether	106-92-3	⊙		○			
21 Allyl isocyanate	1476-23-9	⊙		○		P2RC	
22 Allyl propyl disulfide	2179-59-1			○		P2RC	
23 Aluminium	7429-90-5					P2R	
24 Aluminium hydroxide	21645-51-2					P2R	
25 Aluminium oxide	1344-28-1					P2R	
26 Aluminium alkyl compounds	—	⊙		○		P2RC	
27 p-Aminoazobenzene	60-09-3					P3R	
28 o-Aminoazotoluene	97-56-3					P3R	
29 4-Aminodiphenyl	92-67-1					P3R	
30 3-Amino-9-ethylcarbazol	132-32-1					P2R	
31 2-Aminoethanol	141-43-5	⊙		○		P2RC	
32 2-Aminopyridine	504-29-0					P2R	
33 Amitrole (3-Amino-1,2,4-triazole)	61-82-5					P3R	
34 Ammonia	7664-41-7		⊙	○			
35 Ammonium chloride fume	12125-02-9					P2R	
36 Ammonium sulfamate	7773-06-0					P2R	
37 n-Amyl acetate (1-Pentyl acetate)	628-63-7	⊙		○			
38 sec-Amyl acetate (2-Pentyl acetate)	626-38-0	⊙		○			
39 Aniline	62-53-3	⊙		○			
40 Anisidine, o-isomer	90-04-0	⊙		○		P3RC	
41 Anisidine, p-isomer	104-94-9					P2R	
42 Anthracene	120-12-7					P2R	
43 Antimony and compounds, as Sb	7440-36-0					P3R	
44 Antimony penta chloride	7647-18-9			○		P3RC	
45 Antimony trioxide, as Sb	1309-64-4					P3R	
46 ANTU (α-Naphthylthiourea)	86-88-4					P2R	
47 p-Aramide, fibrous dust	26125-61-1					P2R	
48 Argon	7440-37-1						○

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	Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
			Gas Filter					
			A	K	ABEK	AX		
49	Arsenic and inorganic compounds (except arsine), as As	7440-38-2					P3R	
50	Arsenic acid and its salts, as As	7778-39-4					P3R	
51	Arsenic pentoxide, as AS	1303-28-2					P3R	
52	Arsenic trioxide, as AS	1327-53-3					P3R	
53	Arsenous acid and its salts, as As	13464-58-9					P3R	
54	Arsine	7784-42-1						○
55	Asbestos, all forms	1332-21-4 12001-28-4 12172-73-5 7536-66-4 77536-67-5 77536-68-6 132207-32-0					P3R	
56	Asphalt fume (Bitumen)	8052-42-4	⊙		○		P2RC	
57	Atrazine	1912-24-9					P2R	
58	Auramine	492-80-8					P3R	
59	Azinphos-methyl (Guthion®)	86-50-0					P2R	
<b>B</b>								
60	Barium and soluble compounds, as Ba	7440-39-3					P2R	
61	Barium chloride	10326-27-9					P3R	
62	Benomyl	17804-35-2					P3R	
63	Beechwood dust	—					P3R	
64	Benzaldehyde	100-52-7	⊙		○			
65	Benzene	71-43-2	⊙		○		P2RC	
66	Benzidine	92-87-5					P3R	
67	Benzo[a]pyrene	50-32-8					P3R	
68	Benzo[e]pyrene	192-97-2					P2R	
69	Benzoyl peroxide (Dibenzoyl peroxide)	94-36-0					P2R	
70	Benzylamine	100-46-9	⊙		○		P2RC	
71	Benzyl butyl phthalate	85-68-7	⊙		○			
72	Benzyl chloride	100-44-7			○			
73	Berillium and compounds, as Be	7440-41-7						○
74	4,4'-Bis(dimethylamino)benzophenone (Micher's ketone)	90-94-8					P3R	
75	Biphenyl (Diphenyl)	92-52-4					P2R	
76	Bismuth telluride, Undoped	1304-82-1					P2R	
77	Bismuth telluride, Se-doped, as Bi <sub>2</sub> Te <sub>3</sub>	1304-82-1					P2R	
78	Borax (Sodium tetraborate)	1330-43-4					P2R	
79	Boric acid	10043-35-3					P2R	
80	Boron oxide	1303-86-2					P2R	
81	Boron tribromide	10294-33-4						○
82	Boron trifluoride	7637-07-2						○
83	Bromacil	314-40-9					P3R	
84	2-Bromobutane	78-76-2	⊙		○			
85	Bromine	7726-95-6			○			
86	Bromine pentafluoride	7789-30-2						○
87	Bromobenzene	108-86-1	⊙		○			

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			Gas Filter					
			A	K	ABEK	AX		
88	1-Bromo-2-chloroethane	107-04-0	⊙		○			
89	Bromoethane (Ethyl bromide)	74-96-4				○		
90	Bromoethylene (Vinyl bromide)	593-60-2				○		
91	Bromoform (Tribromomethane)	75-25-2	⊙		○		P2RC	
92	Bromomethane (Methyl bromide)	74-83-9				○		
93	2-Bromopentane	107-81-3	⊙		○			
94	1,3-Butadiene	106-99-0				○		
95	n-Butanal (Butyraldehyde)	123-72-8	⊙		○			
96	n-Butane	106-97-8				○		
97	1,4-Butane sultone	1633-83-6	⊙		○		P2RC	
98	2,4-Butane sultone	1121-03-5	⊙		○		P2RC	
99	1-Butanol (n-Butyl alcohol)	71-36-3	⊙		○			
100	2-Butanol (sec-Butyl alcohol)	78-92-2	⊙		○			
101	2-Butanone (Methyl ethyl ketone)	78-93-3	⊙		○			
102	2-Butanone peroxide (Methyl ethyl ketone peroxide)	1338-23-4					P2R	
103	2-Butenal (Crotonaldehyde)	4170-30-3	⊙		○			
104	2-Butoxyethanol (EGBE)	111-76-2	⊙		○			
105	2-Butoxyethyl acetate (EGBEA)	112-07-2	⊙		○			
106	n-Butyl acetate (1-Butyl acetate)	123-86-4	⊙		○			
107	sec-Butyl acetate (2-Butyl acetate)	105-46-4	⊙		○			
108	tert-Butyl acetate	540-88-5	⊙		○			
109	n-Butyl acrylate	141-32-2	⊙		○			
110	n-Butylamine	109-73-9	⊙		○			
111	sec-Butylamine	13952-84-6				○		
112	tert-Butyl chromate, as CrO <sub>3</sub>	1189-85-1					P2R	
113	Butyl formate	592-84-7	⊙		○			
114	n-Butyl glycidyl ether (BGE)	2426-08-6	⊙		○		P2RC	
115	tert-Butyl glycidyl ether	7665-72-7	⊙		○			
116	tert-Butyl hydroperoxide	75-91-2			○			
117	n-Butyl lactate	138-22-7	⊙		○		P2RC	
118	n-Butyl mercaptan (Butanethiol)	109-79-5			○			
119	n-Butyl methacrylate	97-88-1	⊙		○		P2RC	
120	tert-Butyl peroxyacetate	107-71-1			○		P2RC	
121	o-sec-Butyl phenol	89-72-5	⊙		○		P2RC	
122	p-tert-Butyl phenol	98-54-4					P2R	
123	Butyl stearate	123-95-5	⊙		○		P2RC	
124	p-tert-Butyltoluene	98-51-1	⊙		○			

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	Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
			Gas Filter					
			A	K	ABEK	AX		
<b>C</b>								
125	Cadmium and compounds, as Cd	7440-43-9					P3R	
126	Cadmium chloride, as Cd	10108-64-2					P3R	
127	Cadmium oxide, as Cd	1306-19-0					P3R	
128	Cadmium sulfate, as Cd	1306-23-6					P3R	
129	Calcium arsenate, as As	7778-44-1					P3R	
130	Calcium bisulfide solution	13780-03-5			○		P2RC	
131	Calcium carbonate	1317-65-3					P2R	
132	Calcium chromate, as Cr	13765-19-0					P3R	
133	Calcium cyanamide	156-62-7					P2R	
134	Calcium hydroxide	1305-62-0					P2R	
135	Calcium oxide	1305-78-8					P2R	
136	Camphor, synthetic	76-22-2					P2R	
137	Caprolactam	105-60-2					P2R	
138	Captafol	2425-06-1					P3R	
139	Captan	133-06-2					P3R	
140	Carbaryl (Sevin®)	63-25-2					P2R	
141	Carbofuran	1563-66-2					P3R	
142	Carbon black	1333-86-4					P3R	
143	Carbon dioxide	124-38-9						○
144	Carbon disulfide	75-15-0			○			
145	Carbon monoxide	630-08-0						○
146	Carbon tetrabromide	558-13-4					P2R	
147	Carbon tetrachloride	56-23-5	⊙		○			
148	Carbonyl fluoride	353-50-4						○
149	Cellulose	9004-34-6					P2R	
150	Chlordane	57-74-9					P3R	
151	Chlordecone (Kepone®)	143-50-0	⊙		○		P3RC	
152	Chlorine	7782-50-5			○			
153	Chlorine dioxide	10049-04-4			○			
154	Chlorine trifluoride	7790-91-2						○
155	Chloroacetaldehyde	107-20-0	⊙		○			
156	2-Chloroacetophenone (Phenacyl chloride) (CN)	532-27-4	⊙		○		P2RC	
157	Chloroacetyl chloride	79-04-9	⊙		○			
158	p-Chloroaniline	106-47-8					P3R	
159	Chlorobenzene (Monochlorobenzene)	108-90-7	⊙		○			
160	o-Chlorobenzylidene malononitrile (CS)	2698-41-1					P3R	
161	Chlorobromomethane (Bromochloromethane)	74-97-5	⊙		○			
162	Chlorodiphenyl, 42% chlorine	53469-21-9	⊙		○			
163	Chlorodiphenyl, 54% chlorine	11097-69-1	⊙		○		P3RC	
164	Chloroform (Trichloromethane)	67-66-3				○		
165	N-Chloroformyl-morpholine	15159-40-7	⊙		○		P2RC	
166	bis(Chloromethyl)ether	542-88-1			○			
167	Chloromethyl methyl ether (CMME ; Methyl chloromethyl ether)	107-30-2				○		
168	3-Chloro-2-methyl-1-propene	563-47-3	⊙		○			

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			Gas Filter					
			A	K	ABEK	AX		
169	1-Chloronaphthaline	90-13-1	⊙		○			
170	1-Chloro-1-nitropropane	600-25-9			○	P2RC		
171	1-Chloropentane	543-59-9	⊙		○			
172	Chloropicrin (Trichloronitromethane)	76-06-2	⊙		○			
173	β-Chloroprene (2-Chloro-1.3-butadiene)	126-99-8				○		
174	1-Chloropropane	540-54-5				○		
175	2-Chloropropane (Isopropyl chloride)	75-29-6				○		
176	o-Chlorostyrene	2039-87-4	⊙		○			
177	o-Chlorotoluene	95-49-8			○			
178	4-Chloro-o-toluidine	95-69-2	⊙		○	P3RC		
179	5-Chloro-o-toluidine	95-79-4	⊙		○	P2RC		
180	Chlorpyrifos	2921-88-2	⊙		○	P3RC		
181	Chromic acid and chromates, as Cr	7738-94-5				P3R		
182	Chromite, as Cr	—				P2R		
183	Chromium (III) inorganic compounds, as Cr	7440-47-3				P2R		
184	Chromium (VI) inorganic compounds, water-soluble, as Cr	—				P3R		
185	Chromium (VI) inorganic compounds, insoluble, as Cr	—				P3R		
186	Chromium carbonyl	13007-92-6					○	
187	Chromium (III) oxide	1308-38-9				P2R		
188	Chromium oxychloride	14977-61-8			○			
189	Citric acid	77-92-9				P2R		
190	Coal dust, anthracite	—				P2R		
191	Coal dust, bituminous or lignite	—				P2R		
192	Coal tar pitch volatiles, as benzene soluble aerosol	65996-93-2	⊙		○	P3RC		
193	Cobalt and compounds	7440-48-4				P3R		
194	Cobalt (II) acetate tetrahydrate	6147-53-1				P2R		
195	Coconut oil	—				P2R		
196	Copper, dusts and mists, as Cu	7440-50-8				P2R		
197	Copper, fume, as Cu	7440-50-8				P2R		
198	Copper (II) chloride	7447-39-4				P2R		
199	Copper (II) sulfate	7758-98-7				P2R		
200	Cotton dust, raw, untreated	—				P3R		
201	Cresol, all isomers	1319-77-3	⊙		○	P2RC		
202	Cumene	98-82-8	⊙		○			
203	Cumene hydroperoxide	80-15-9			○			
204	Cyanamide	420-04-2			○	P2RC		
205	Cyanides, as CN	—			○	P3RC		
206	Cyanogen	460-19-5					○	
207	Cyanogen bromide	506-68-3			○	P3RC		
208	Cyanogen chloride	506-77-4					○	
209	Cyanuric chloride	108-77-0			○	P2RC		
210	Cyclohexane	110-82-7	⊙		○	P2RC		
211	Cyclohexanol	108-93-0	⊙		○	P2RC		
212	Cyclohexanone	108-94-1	⊙		○			
213	Cyclohexene	110-83-8	⊙		○			
214	Cyclohexylamine	108-91-8	⊙		○			

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	Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
			Gas Filter					
			A	K	ABEK	AX		
215	Cyclonite (RDX)	121-82-4					P2R	
216	1,3-Cyclopentadiene	542-92-7				○		
217	Cyclopentanone	120-92-3	⊙		○			
<b>D</b>								
218	2,4-D (2,4-Dichlorophenoxyacetic acid)	94-75-7					P2R	
219	DDT (Dichlorodiphenyltrichloro-ethane)	50-29-3					P3R	
220	Decaborane	17702-41-9						○
221	n-Decane	124-18-5	⊙		○			
222	1-Decanol	112-30-1	⊙		○		P2RC	
223	Demeton (Systox®)	8065-48-3	⊙		○		P3RC	
224	Diacetone alcohol (4-Hydroxy-4-methyl-2-pentanone)	123-42-2	⊙		○			
225	Diacetyl peroxide	110-22-5			○		P2RC	
226	2,4-Diaminoanisole	615-05-4					P3R	
227	3,3'-Diaminobenzidine	91-95-2					P2R	
228	3,3'-Diaminobenzidine	7411-49-5					P2R	
229	4,4'-Diamino-3,3'-	838-88-0					P3R	
230	2,4-Diaminotoluene (Toluene-2,4-diamine)	95-80-7					P3R	
231	Diatomaceous earth, calcinated	99439-28-8					P2R	
232	Diatomaceous earth, uncalcinated	61790-53-2					P3R	
233	Diazinon®	333-41-5	⊙		○		P3RC	
234	Diazomethane	334-88-3						○
235	Dibenzylamine	103-49-1	⊙		○			
236	Dibenzylether	103-50-4	⊙		○		P2RC	
237	Diborane	19287-45-7						○
238	1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	⊙		○		P3RC	
239	1,2-Dibromoethane	106-93-4	⊙		○		P3RC	
240	2-N-Dibutylaminoethanol	102-81-8	⊙		○		P2RC	
241	Dibutyl ether	142-96-1	⊙		○			
242	Dibutyl phosphate	107-66-4	⊙		○			
243	Dibutyl phthalate	84-74-2	⊙		○			
244	Dichloroacetylene	7572-29-4				○		
245	o-Dichlorobenzene	95-50-1	⊙		○			
246	m-Dichlorobenzene	541-73-1	⊙		○			
247	p-Dichlorobenzene	106-46-7	⊙		○		P3RC	
248	3,3'-Dichlorobenzidine	91-94-1					P3R	
249	1,4-Dichloro-2-butene	764-41-0	⊙		○		P3RC	
250	2,2'-Dichlorodiethyl ether	111-44-4	⊙		○			
251	Dichlorodiisopropyl ether	108-60-1	⊙		○			
252	Dichlorodimethyl ether	4885-02-3	⊙		○		P2RC	
253	1,3-Dichloro-5,5-dimethyl hydantoin	118-52-5					P2R	
254	1,1-Dichloroethane	75-34-3				○		
255	1,2-Dichloroethane	107-06-2	⊙		○			
256	1,1-Dichloroethene	75-35-4				○		
257	cis-1,2-Dichloroethene	156-59-2				○		
258	trans-1,2-Dichloroethene	156-60-5				○		
259	Dichloromethane	75-09-2				○		



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			Gas Filter					
			A	K	ABEK	AX		
260	1,2-Dichloromethoxyethane	41683-62-9	⊙		○		P2RC	
261	1,1-Dichloro-1-nitroethane	594-72-9	⊙		○		P2RC	
262	1,2-Dichloropropane	78-87-5	⊙		○			
263	1,3-Dichloro-2-propanol	96-23-1	⊙		○			
264	1,3-Dichloropropene	542-75-6	⊙		○			
265	2,2-Dichloropropionic acid	75-99-0	⊙		○		P2RC	
266	Dichlorotetrafluoroethane (1,2-Dichloro-1,1,2,2-	76-14-2				○		
267	2,4-Dichlorotoluene	95-73-8	⊙		○			
268	Dichlorvos (DDVP)	62-73-7	⊙		○		P3RC	
269	Dicyclohexylmethane-4,4'-	5124-30-1	⊙		○		P3RC	
270	Dicyclohexyl peroxide	1758-61-8	⊙		○		P2RC	
271	Dicyclohexyl phthalate	84-61-7					P2R	
272	Dicyclopentadiene	77-73-6	⊙		○		P2RC	
273	Dicyclopentadienyl iron, as Fe (Forrocene)	102-54-5					P2R	
274	Dieldrin	60-57-1					P3R	
275	Diesel fuel	68476-30-2 68334-30-5 68476-34-6 77650-28-3	⊙		○			
276	Diethanolamine	111-42-2	⊙		○		P3RC	
277	Diethylamine	109-89-7				○		
278	2-Diethylaminoethanol	100-37-8			○			
279	Diethyl carbonate	105-58-8	⊙		○			
280	Diethylene glycol	111-46-6	⊙		○			
281	Diethylene triamine	111-40-0	⊙		○			
282	Diethyl ether (Ethyl ether)	60-29-7				○		
283	N,N-Diethylhydroxylamine (DEHA)	3710-84-7	⊙		○		P2RC	
284	Diethyl oxalate	95-92-1	⊙		○			
285	Diethyl phtalate	84-66-2	⊙		○			
286	Diethyl sebacate	110-40-7	⊙		○		P2RC	
287	Diethyl sulfate	64-67-5	⊙		○			
288	Diethyl sulfide	352-93-2			○			
289	Difluorobromomethane	1511-62-2				○		
290	Difluorodibromomethane	75-61-6				○		
291	Diglycidyl ether (DGE)	2238-07-5	⊙		○		P2RC	
292	1,2-Dihydroxybenzene (Catechol)	120-80-9					P3R	
293	1,3-Dihydroxybenzene (Resorcinol)	108-46-3					P2R	
294	1,4-Dihydroxybenzene (Hydroquinone)	123-31-9					P3R	
295	Diisobutyl ketone	108-83-8	⊙		○			
296	Diisopropylamine	108-18-9	⊙		○			
297	Dilauroyl peroxide	105-74-8	⊙		○		P2RC	
298	3,3'-Dimethoxybenzidine	119-90-4					P3R	
299	1,1-Dimethoxyethane	534-15-6				○		
300	1,2-Dimethoxyethane	110-71-4	⊙		○			

⊙ : Highly Recommended ○ : Recommended

	Substance	CAS No.	Recommended Filter				Airline or SCBA	
			Gas Filter					Particle Filter
			A	K	ABEK	AX		
301	Dimethoxymethane	109-87-5				○		
302	N,N-Dimethylacetamide	127-19-5	⊙		○			
303	Dimethylamine	124-40-3				○		
304	1-Dimethylamino-2-propanol	108-16-7	⊙		○			
305	N,N-Dimethylaniline	121-69-7	⊙		○		P2RC	
306	3,3'-Dimethylbenzidine (Tolidine)	119-93-7					P3R	
307	2,2-Dimethylbutane	75-83-2				○		
308	2,3-Dimethylbutane	79-29-8				○		
309	1,3-Dimethylbutyl acetate	108-84-9	⊙		○		P2RC	
310	Dimethylcarbamoyl chloride	79-44-7			○			
311	N,N-Dimethylcyclohexylamine	98-94-2	⊙		○			
312	Dimethyl disulfide	624-92-0			○			
313	N,N-Dimethylethanolamine	108-01-0	⊙		○			
314	Dimethyl ether	115-10-6				○		
315	N,N-Dimethylethylamine	598-56-1				○		
316	N,N-Dimethylformamide	68-12-2	⊙		○			
317	1,1-Dimethylhydrazine	57-14-7		⊙	○			
318	1,2-Dimethylhydrazine	540-73-8		⊙	○			
319	Dimethyl hydrogen phosphite	868-85-9	⊙		○			
320	N,N-Dimethylisopropylamine	996-35-0	⊙		○		P2RC	
321	Dimethyl phthalate	131-11-3	⊙		○		P2RC	
322	2,2-Dimethyl propane (Neopentane)	463-82-1				○		
323	Dimethyl sulfate	77-78-1	⊙		○			
324	Dimethyl sulfide	75-18-3	⊙		○			
325	1,2-Dinitrobenzene	528-29-0					P2R	
326	1,3-Dinitrobenzene	99-65-0					P2R	
327	1,4-Dinitrobenzene	100-25-4					P2R	
328	4,6-Dinitro-o-cresol	534-52-1					P3R	
329	1,5-Dinitronaphthalene	605-71-0					P2R	
330	2,6-Dinitronaphthalene	24824-26-8	⊙		○		P2RC	
331	Dinitropyrene	78432-19-6					P2R	
332	2,3-Dinitrotoluene	602-01-7					P2R	
333	2,4-Dinitrotoluene	121-14-2					P3R	
334	2,5-Dinitrotoluene	619-15-8					P2R	
335	2,6-Dinitrotoluene	606-20-2					P3R	
336	3,4-Dinitrotoluene	610-39-9					P2R	
337	3,5-Dinitrotoluene	618-85-9					P2R	
338	1,4-Dioxane	123-91-1	⊙		○		P3RC	
339	Dioxathion	78-34-2				○		
340	1,3-Dioxolane	646-06-0	⊙		○			
341	Dipentene	138-86-3	⊙		○			
342	Diphenylamine	122-39-4					P2R	
343	Diphenyl ether	101-84-8	⊙		○		P2RC	
344	Diphenylmethane diisocyanate (MDI)	101-68-8	⊙		○		P3RC	
345	Dipropylamine	142-84-7	⊙		○			
346	Dipropylene glycol methyl ether	34590-94-8	⊙		○			
347	Dipropyl ether	111-43-3	⊙		○			
348	Diquat dibromide	85-00-7					P3R	
349	Disulfoton	298-04-4			○		P3RC	

⊙ : Highly Recommended ○ : Recommended

	Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
			Gas Filter					
			A	K	ABEK	AX		
350	Disulfur dichloride (Sulfur monochloride)	10025-67-9			○			
351	Di-sec-octyl phthalate	117-81-7	⊙		○			
352	Disulfiram	97-77-8				P2R		
353	2,6-Di-tert-butyl-p-cresol	128-37-0				P2R		
354	Di-tert-butyl peroxide	110-05-4	⊙		○			
355	Diuron	330-54-1				P2R		
356	1,2-Divinylbenzene	91-14-5	⊙		○			
357	1,3-Divinylbenzene	108-57-6	⊙		○			
358	Dodecylbenzene	123-01-3	⊙		○			
<b>E</b>								
359	Emery	1302-74-5				P2R		
360	Endosulfan	115-29-7				P3R		
361	Endrin	72-20-8				P3R		
362	Enflurane	13838-16-9				○ P2RC		
363	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	106-89-8	⊙		○			
364	EPN (O-Ethyl O-4-nitrophenyl phenyl phosphonothioate)	2104-64-5	⊙		○	P3RC		
365	1,2-Epoxybutane	106-88-7				○		
366	Ethanol	64-17-5	⊙		○			
367	2-Ethoxyethanol (EGEE; Cellosolve)	110-80-5	⊙		○			
368	2-Ethoxyethyl acetate (EGEEA; Cellosolve acetate)	111-15-9	⊙		○			
369	Ethyl acetate	141-78-6	⊙		○			
370	Ethyl acrylate (Acrylic acid)	140-88-5	⊙		○			
371	Ethylamine	75-04-7				○		
372	Ethyl amyl ketone (5-Methyl-3-heptanone)	541-85-5	⊙		○			
373	Ethyl benzene	100-41-4	⊙		○			
374	Ethyl carbamate (Urethane)	51-79-6	⊙		○	P3RC		
375	Ethyl chloride (Chloroethane)	75-00-3				○		
376	Ethyl chloroacetate	105-39-5	⊙		○			
377	Ethylene chlorohydrin (2-Chloroethanol)	107-07-3	⊙		○			
378	Ethylenediamine (1,2-Diaminoethane)	107-15-3	⊙		○	P2RC		
379	Ethyleneimine (Aziridine)	151-56-4		⊙	○			
380	Ethylene glycol	107-21-1	⊙		○			
381	Ethylene glycol dinitrate (EGDN)	628-96-6	⊙		○			
382	Ethylene glycol monoisopropyl ether	109-59-1	⊙		○			
383	Ethylene oxide	75-21-8				○		
384	Ethyl formate (Formic acid ethyl ester)	109-94-4				○		
385	2-Ethyl-1-hexanol	104-76-7	⊙		○			

⊙: Highly Recommended ○: Recommended

	Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
			Gas Filter					
			A	K	ABEK	AX		
386	Ethyl mercaptane (Ethanethiol)	75-08-1				○		
387	4-Ethylmorpholine	100-74-3	⊙		○			
388	Ethyl propionate	105-37-3	⊙		○			
389	Ethyl silicate (Silicic acid tetraethyl ester)	78-10-4	⊙		○			
<b>F</b>								
390	Fenchlorophos	299-84-3	⊙		○		P2RC	
391	Fention	55-38-9	⊙		○		P3RC	
392	Ferbam	14484-64-1					P2R	
393	Ferrocene	102-54-5					P2R	
394	Ferrovandium dust	12604-58-9					P2R	
395	Flour dust	—					P2R	
396	Fluorides, as F	—			○		P2RC	
397	Fluorine	7782-41-4			○			
398	Fluorobenzene	462-06-6	⊙		○			
399	Formaldehyde	50-00-0			○			
400	Formamide	75-12-7	⊙		○		P2RC	
401	Formic acid	64-18-6			○		P2RC	
402	Fuel oils	—	⊙		○		P2RC	
403	Furan	110-00-9				○		
404	Furfural	98-01-1	⊙		○			
405	Furfuryl alcohol	98-00-0	⊙		○			
<b>G</b>								
406	Gasoline	86290-81-5 8006-61-9	⊙		○			
407	Gelatin	9000-70-8					P2R	
408	Germanium tetrahydride	7782-65-2					○	
409	Glass, fibrous or dust	—					P3R	
410	Glutaraldehyde	111-30-8	⊙		○			
411	Glycerine	56-81-5	⊙		○		P2RC	
412	Glycidol (2,3-Epoxy-1-propanol)	556-52-5	⊙		○			
413	Glycidyl isopropyl ether	4016-14-2	⊙		○		P2RC	
414	Glyoxal	107-22-2				○	P3RC	
415	Graphite, natural	7782-42-5					P2R	
<b>H</b>								
416	Hafnium and compounds, as Hf	7440-58-6					P2R	
417	Helium	7440-59-7					○	
418	Halotane (2-Bromo-2-chloro-1,1,1-	151-67-7				○		
419	Heptachlor	76-44-8					P3R	
420	n-Heptane	142-82-5	⊙		○			
421	2-Heptanone	110-43-0	⊙		○			
422	3-Heptanone	106-35-4	⊙		○			
423	4-Heptanone	123-19-3	⊙		○			
424	Hexachlorobenzene (HCB)	118-74-1					P3R	
425	Hexachlorocyclopentadiene	77-47-4	⊙		○			
426	Hexachloroethane	67-72-1	⊙		○		P3RC	
427	Hexamethylenediamine	124-09-4	⊙		○		P2RC	
428	Hexamethylene diisocyanate	822-06-0	⊙		○			
429	Hexamethylenetetramine	100-97-0			○		P2RC	

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	Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
			Gas Filter					
			A	K	ABEK	AX		
430	Hexamethylphosphoramide	680-31-9	⊙		○		P3RC	
431	n-Hexane	110-54-3	⊙		○			
432	n-Hexanol	111-27-3	⊙		○			
433	2-Hexanone	591-78-6	⊙		○			
434	1-Hexene	592-41-6				○		
435	cis-2-Hexene	7688-21-3	⊙		○			
436	trans-2-Hexene	4050-45-7	⊙		○			
437	Hexylamine	111-26-2	⊙		○			
438	Hexylene glycol	107-41-5	⊙		○			
439	Hydrazine	302-01-2		⊙	○		P3RC	
440	Hydrazobenzene (1,2-Diphenylhydrazine)	122-66-7					P2R	
441	Hydrazoic acid	7782-79-8			○			
442	Hydrogenated terphenyls	61788-32-7	⊙		○			
443	Hydrogen bromide	10035-10-6			○			
444	Hydrogen chloride	7647-01-0			○			
445	Hydrogen cyanide	74-90-8			○			
446	Hydrogen fluoride, as F	7664-39-3			○			
447	Hydrogen peroxide	7722-84-1			○			
448	Hydrogen selenide	7783-07-5			○			
449	Hydrogen sulfide	7783-06-4			○			
450	Hydroxylamine	7803-49-8			○			
451	2-Hydroxypropyl acrylate	999-61-1	⊙		○			
452	Indene	95-13-6	⊙		○			
453	Indium and compounds, as In	7440-74-6					P3R	
454	Inorganic fiber	—					P3R	
455	Iodine	7553-56-2	⊙		○		P3RC	
456	Iodoform	75-47-8	⊙		○		P2RC	
457	Iodomethane (Methyl iodide)	74-88-4				○		
458	Iron( II ) chloride	7758-94-3					P2R	
459	Iron(III) chloride	7705-08-0					P2R	
460	Iron( II ) oxide	1345-25-1					P2R	
461	Iron(III) oxide	1309-37-1					P2R	
462	Iron pentacarbonyl	13463-40-6	⊙		○			
463	Iron( II ) sulfide	1317-37-9					P2R	
464	Iron(III) sulfide	12063-27-3					P2R	
465	Iron salts, soluble, as Fe	—					P2R	
466	Isoamyl acetate	123-92-2	⊙		○			
467	Isoamyl alcohol	123-51-3	⊙		○			
468	Isobutane	75-28-5				○		
469	Isobutanol (Isobutyl alcohol)	78-83-1	⊙		○			
470	Isobutyl acetate	110-19-0	⊙		○			
471	Isobutylamine	78-81-9	⊙		○			
472	Isobutylformate	542-55-2	⊙		○			
473	Isobutyraldehyde	78-84-2				○		
474	Isoflurane	26675-46-7				○	P2RC	
475	Isooctane (2,2,4-Trimethylpentane)	540-84-1	⊙		○			
476	Isophorone	78-59-1	⊙		○			
477	Isophorone diisocyanate	4098-71-9	⊙		○			

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	Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
			Gas Filter					
			A	K	ABEK	AX		
478	Isopropyl acetate	108-21-4	⊙		○			
479	Isopropylamine	75-31-0				○		
480	N-Isopropylaniline	768-52-5				○		
481	Isopropyl ether	108-20-3	⊙		○			
482	Isopropyl nitrate	1712-64-7	⊙		○		P2RC	
483	Isopropyl oil	—	⊙		○		P2RC	
<b>J</b>								
484	Jet fuel	—	⊙		○		P2RC	
<b>K</b>								
485	Kerosene	—	⊙		○		P2RC	
<b>L</b>								
486	Lactic acid	50-21-5			○		P2RC	
487	Lead and inorganic compounds, as Pb	7439-92-1					P3R	
488	Lead alkyls	75-74-1 78-00-2	⊙		○		P3RC	
489	Lead(II) acetate trihydrate	6080-56-4					P2R	
490	Lead arsenate	3687-31-8					P3R	
491	Lead chromate	7758-97-6					P3R	
492	Linseed oil	—	⊙		○		P2RC	
493	Lindane (γ-Hexachlorocyclohexane)	58-89-9					P3RC	
494	Lithium hydride	7580-67-8					P3R	
495	Lithium hydroxide	1310-65-2					P2R	
<b>M</b>								
496	Magnesium chloride	7786-30-3					P2R	
497	Magnesium hydroxide	1309-42-8					P2R	
498	Magnesium oxide	1309-48-4					P2R	
499	Magnesium sulfate	7487-88-9					P2R	
500	Malathion	121-75-5	⊙		○		P2RC	
501	Maleic acid	110-16-7					P2R	
502	Maleic anhydride	108-31-6	⊙		○		P3RC	
503	Manganese and inorganic compounds,	7439-96-5					P2R	
504	Manganese, fume, as Mn	7439-96-5					P2R	
505	Manganese cyclopentadienyl tricarbonyl,	12079-65-1					P3R	
506	Manganese(IV) oxide	1313-13-9					P2R	
507	2-Mercaptoethanol	60-24-2			○			
508	Mercury and compounds, as Hg	7439-97-6					○	
509	Mesityl oxide	141-79-7	⊙		○			
510	Methacrylic acid	79-41-4	⊙		○		P2RC	
511	Methacrylonitrile	126-98-7	⊙		○			
512	Methane	74-82-8					○	
513	Methanol (Methyl alcohol)	67-56-1				○		
514	Methomyl	16752-77-5					P3R	
515	Methoxychlor	72-43-5					P2R	
516	2-Methoxyethanol (EGME)	109-86-4	⊙		○			
517	2-Methoxyethyl acetate (EGMEA)	110-49-6	⊙		○			
518	1-Methoxy-2-propanol	107-98-2	⊙		○			

⊙: Highly Recommended ○: Recommended

	Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
			Gas Filter					
			A	K	ABEK	AX		
519	2-Methoxy-1-propanol	1589-47-5	⊙		○			
520	1-Methoxy-2-propanol acetate	108-65-6	⊙		○			
521	2-Methoxy-1-propanol acetate	70657-70-4	⊙		○			
522	Methyl acetate	79-20-9				○		
523	Methyl acrylate	96-33-3	⊙		○			
524	Methylamine	74-89-5		⊙	○			
525	N-Methylaniline	100-61-8	⊙		○			
526	2-Methylbutane	78-78-4				○		
527	Methyl-tert-butyl ether	1634-04-4				○		
528	Methyl chloroform (1,1,1-Trichloroethane)	71-55-6	⊙		○			
529	Methyl-2-cyanoacrylate	137-05-3			○			
530	Methylcyclohexane	108-87-2	⊙		○			
531	Methylcyclohexanol	25639-42-3	⊙		○			
532	2-Methylcyclohexanone	583-60-8	⊙		○			
533	Methyl demeton (Demeton-methyl)	8022-00-2	⊙		○		P3RC	
534	4,4'-Methylene-bis(2-chloroaniline) (MBOCA)	101-14-4					P3R	
535	4,4'-Methylene dianiline (4,4'-Diaminodiphenyl-methane)	101-77-9					P3R	
536	Methyl ethyl ketone peroxide	1338-23-4	⊙		○			
537	Methyl formate	107-31-3				○		
538	Methyl hydrazine	60-34-4			○			
539	Methyl isoamyl ketone (5-Methyl-2-hexanone)	110-12-3	⊙		○			
540	Methyl isobutyl carbinol (4-Methyl-2-pentanol)	108-11-2	⊙		○			
541	Methyl isobutyl ketone (4-Methyl-2-pentanone)	108-10-1	⊙		○			
542	Methyl isocyanate	624-83-9				○		
543	Methyl mercaptan (Methanethiol)	74-93-1				○		
544	Methyl mercury	22967-92-6					○	
545	Methyl methacrylate	80-62-6	⊙		○			
546	Methyl parthion	298-00-0	⊙		○		P3RC	
547	2-Methylpentane	107-83-5				○		
548	3-Methylpentane	96-14-0				○		
549	4-Methylpent-3-en-2-on	141-79-7	⊙		○			
550	2-Methyl-2-propanol (tert-Butyl alcohol)	75-65-0	⊙		○		P2RC	
551	Methyl propyl ketone (2-Pentanone)	107-87-9	⊙		○			
552	2-Methyl-2-propanethiol	75-66-1				○		
553	Methyl propionate	554-12-1	⊙		○			
554	N-Methyl-2-pyrrolidone	872-50-4	⊙		○			
555	Methyl silicate	681-84-5	⊙		○			
556	α-Methyl styrene	98-83-9	⊙		○			
557	Mevinphos (Phosdrin®)	7786-34-7	⊙		○		P3RC	
558	Mineral wool fiber	—					P2R	
559	Molybdenum and compounds, as Mo	7439-98-7					P3R	
560	Monochloroacetic acid	79-11-8					P2R	

⊙: Highly Recommended ○: Recommended

	Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
			Gas Filter					
			A	K	ABEK	AX		
561	Morpholine	110-91-8	⊙		○			
562	Motor oils, used	—	⊙		○	P2RC		
563	Mustard gas (2,2'-Dichlorodiethyl sulfide)	505-60-2			○	P3RC		
<b>N</b>								
564	Naled (Dibrom)	300-76-5	⊙		○	P3RC		
565	Naphtha, Benzin	8030-30-6	⊙		○	P2RC		
566	Naphtha (petroleum), Hydrotreated heavy	64742-48-9	⊙		○	P2RC		
567	Naphthalene	91-20-3	⊙		○	P3RC		
568	1,5-Naphthalene diisocyanate (NDI)	3173-72-6				P2R		
569	α-Naphthylamine (1-Naphthylamine)	134-32-7				P2R		
570	β-Naphthylamine (2-Naphthylamine)	91-59-8				P3R		
571	Neon	7440-01-9					○	
572	Nickel	7440-02-0				P3R		
573	Nickel carbonate	3333-67-3				P3R		
574	Nickel chloride	7718-54-9				P3R		
575	Nickel oxide	1313-99-1				P3R		
576	Nickel sulfide	16812-54-7				P3R		
577	Nicotine	54-11-5	⊙		○			
578	Nitrapyrin (2-Chloro-6-(trichloromethyl)pyridine)	1929-82-4				P2R		
579	Nitric acid	7697-37-2			○			
580	5-Nitroacenaphthene	602-87-9				P3R		
581	2-Nitro-4-aminophenol	119-34-6				P2R		
582	4-Nitroaniline	100-01-6				P2R		
583	Nitrobenzene	98-95-3	⊙		○	P3RC		
584	4-Nitrobiphenyl	92-93-3				P3R		
585	Nitroethane	79-24-3	⊙		○			
586	Nitrogen dioxide	10102-44-0			○			
587	Nitrogen monoxide	10102-43-9					○	
588	Nitrogen trifluoride	7783-54-2					○	
589	Nitroglycerin (Glyceryl trinitrate)	55-63-0	⊙		○	P2RC		
590	Nitromethane	75-52-5	⊙		○			
591	1-Nitronaphthalene	86-57-7				P2R		
592	2-Nitronaphthalene	581-89-5				P2R		
593	5-Nitro-o-toluidine	99-55-8				P3R		
594	2-Nitro-1,4-phenylenediamine	5307-14-2				P2R		
595	1-Nitropropane	108-03-2	⊙		○			
596	2-Nitropropane	79-46-9	⊙		○			
597	1-Nitropyrene	5522-43-0				P3R		
598	2-Nitropyrene	789-07-1				P2R		
599	4-Nitropyrene	57835-92-4				P3R		
600	N-Nitrosodiethanolamine (NDELA)	1116-54-7				P3R		
601	N-Nitrosodiethylamine (NDEA)	55-18-5	⊙		○	P3RC		
602	N-Nitrosodiisopropylamine	601-77-4				P2R		



⊙: Highly Recommended ○: Recommended

	Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
			Gas Filter					
			A	K	ABEK	AX		
603	N-Nitrosodimethylamine	62-75-9	⊙		○		P2RC	
604	N-Nitrosodi-n-butylamine (DBN)	924-16-3	⊙		○		P3RC	
605	N-Nitrosodi-n-propylamine (NDPA)	621-64-7	⊙		○		P3RC	
606	N-Nitrosoethylphenylamine	612-64-6					P2R	
607	N-Nitrosomethylethylamine	10595-95-6	⊙		○		P3RC	
608	N-Nitrosomethylphenylamine	614-00-6	⊙		○		P2RC	
609	N-Nitrosomorpholine (NMOR)	59-89-2	⊙		○		P3RC	
610	N-Nitrosopiperidine (NPIP)	100-75-4	⊙		○		P3RC	
611	N-Nitrosopyrrolidine (NPYR)	930-55-2	⊙		○		P3RC	
612	2-Nitrotoluene	88-72-2	⊙		○			
613	3-Nitrotoluene	99-08-1	⊙		○		P3RC	
614	4-Nitrotoluene	99-99-0					P2R	
615	Nonane	111-84-2	⊙		○			
<b>O</b>								
616	Oakwood dust	—					P3R	
617	Octachloronaphthalene	2234-13-1					P3R	
618	n-Octane	111-65-9	⊙		○			
619	1-Octanol	111-87-5	⊙		○			
620	1-Octene	111-66-0	⊙		○			
621	Oil mist, mineral	8012-95-1	⊙		○		P2RC	
622	Osmium tetroxide	20816-12-0			○		P3RC	
623	Oxalic acid	144-62-7					P2R	
624	4,4'-Oxydianiline	101-80-4					P3R	
625	Oxygen difluoride	7783-41-7					○	
626	Ozone	10028-15-6				○		
<b>P</b>								
627	Palmitic acid	57-10-3					P2R	
628	Paraffin wax fume	8002-74-2	⊙		○		P2RC	
629	Paraldehyde	123-63-7	⊙		○		P2RC	
630	Paraquat dichloride	1910-42-5					P3R	
631	Parathion	56-38-2	⊙		○		P3RC	
632	Pentaborane	19624-22-7					○	
633	Pentachloroethane	76-01-7	⊙		○			
634	Pentachloronaphthalene	1321-64-8					P2R	
635	Pentachlorophenol	87-86-5					P3R	
636	Pentane	109-66-0				○		
637	n-Pentanol	71-41-0	⊙		○			
638	Peracetic acid	79-21-0			○		P2RC	
639	Perchloromethyl mercaptan	594-42-3	⊙		○		P2RC	
640	Perchloryl fluoride	7616-94-6			○			
641	Permethrin	52645-53-1	⊙		○		P2RC	
642	Phenol	108-95-2	⊙		○		P2RC	
643	Phenolphthalein dissolved in ethanol	77-09-8	⊙		○		P3RC	
644	Phenyl acetate	122-79-2	⊙		○		P2RC	
645	p-Phenylenediamine	106-50-3					P3R	
646	Phenyl ether	101-84-8	⊙		○		P2RC	
647	Phenyl ether/biphenyl mixture	8004-13-5	⊙		○		P2RC	

⊙ : Highly Recommended ○ : Recommended

	Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
			Gas Filter					
			A	K	ABEK	AX		
648	Phenyl glycidyl ether (PGE)	122-60-1	⊙		○		P2RC	
649	Phenylhydrazine	100-63-0	⊙		○		P3RC	
650	Phenyl isocyanate	103-71-9			○			
651	Phenyl mercaptan	108-98-5			○		P2RC	
652	N-Phenyl-β-naphthylamine	135-88-6					P2R	
653	Phenylphosphine	638-21-1						○
654	Phorate	298-02-2	⊙		○			
655	Phosgene (Carbonyl chloride)	75-44-5			○			
656	Phosphine	7803-51-2						○
657	Phosphoric acid	7664-38-2			○		P2RC	
658	Phosphorous acid	13598-36-2					P2R	
659	Phosphorus, Yellow	12185-10-3			○		P3RC	
660	Phosphorus oxychloride	10025-87-3			○		P2RC	
661	Phosphorus pentachloride	10026-13-8			○		P2RC	
662	Phosphorus pentasulfide	1314-80-3			○		P2RC	
663	Phosphorus pentoxide	1314-56-3			○		P2RC	
664	Phthalic anhydride	85-44-9	⊙		○		P2RC	
665	Picloram	1918-02-1					P2R	
666	Picric acid	88-89-1					P3R	
667	Platinum, soluble salts, as Pt	7440-06-4					P2R	
668	Polychlorinated biphenyls (PCBs)	1336-36-3					P3R	
669	Polyvinyl chloride (PVC)	9002-86-2					P2R	
670	Portland cement	65997-15-1					P2R	
671	Potassium chloride	7447-40-7					P2R	
672	Potassium chromate	7789-00-6					P3R	
673	Potassium cyanide, as CN	151-50-8					P3R	
674	Potassium hydroxide	1310-58-3					P2R	
675	Potassium sulfate	7778-80-5					P2R	
676	1,3-Propane sultone	1120-71-4	⊙		○		P3RC	
677	2-Propanethiol	75-33-2				○		
678	n-Propanol (n-Propyl alcohol)	71-23-8	⊙		○			
679	2-Propanol (Isopropyl alcohol)	67-63-0	⊙		○			
680	Propargyl alcohol	107-19-7	⊙		○			
681	β-Propiolactone	57-57-8	⊙		○			
682	Propionaldehyde (Propanal)	123-38-6				○		
683	Propionic acid	79-09-4			○			
684	Propoxur	114-26-1					P3R	
685	n-Propyl acetate	109-60-4	⊙		○			
686	Propylamine	107-10-8		⊙	○			
687	Propylene	115-07-1						○
688	Propylene glycol	57-55-6	⊙		○			
689	Propylene glycol dinitrate (PGDN)	6423-43-4	⊙		○		P2RC	
690	Propylene oxide (1,2-Epoxypropane)	75-56-9				○		
691	Propyleneimine	75-55-8	⊙		○		P3RC	

⊙ : Highly Recommended ○ : Recommended

	Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
			Gas Filter					
			A	K	ABEK	AX		
692	Propyl formate	110-74-7	⊙		○			
693	n-Propyl mercaptan	107-03-9			○			
694	Pyrethrum	8003-34-7	⊙		○	P2RC		
695	Pyridine	110-86-1	⊙		○			
<b>Q</b>								
696	Quinone (p-Benzoquinone)	106-51-4	⊙		○	P2RC		
<b>R</b>								
697	Rodium, elemental	7440-16-6				P2R		
698	Rotenone, commercial	83-79-4	⊙		○	P2RC		
<b>S</b>								
699	Salicylic acid	69-72-7				P2R		
700	Sarin (GB)	107-44-8	⊙		○	P3RC		
701	Selenium compounds, as Se	7782-49-2				P3R		
702	Silica, amorphous, fused	60676-86-0				P2R		
703	Silica, amorphous, silica fume	69012-64-2				P2R		
704	Silica, crystalline, cristobalite	14464-46-1				P3R		
705	Silica, crystalline, α-quartz	14808-60-7				P3R		
706	Silicon carbide, fibrous dust	409-21-2				P3R		
707	Silicon carbide, nonfibrous	409-21-2				P2R		
708	Silver, metal	7440-22-4				P3R		
709	Silver, soluble compounds, as Ag	7440-22-4				P3R		
710	Soap solution	—				P2R		
711	Sodium azide	26628-22-8				P2R		
712	Sodium benzoate	532-32-1				P2R		
713	Sodium bisulfite	7631-90-5				P2R		
714	Sodium chlorate	7775-09-9				P2R		
715	Sodium chloride	7647-14-5				P2R		
716	Sodium chromate	7775-11-3				P2R		
717	Sodium cyanide, as CN	143-33-9			○	P3RC		
718	Sodium fluoroacetate	62-74-8			○	P3RC		
719	Sodium hydrogen carbonate	144-55-8				P2R		
720	Sodium hydroxide	1310-73-2				P2R		
721	Sodium metabisulfite	7681-57-4				P2R		
722	Sodium silicate	6834-92-0				P2R		
723	Sodium sulfate	7757-82-6				P2R		
724	Sodium thiosulfate	7772-98-7			○	P2RC		
725	Soman (GD)	96-64-0	⊙		○	P3RC		
726	Stearic acid	57-11-4				P2R		
727	Stibine	7803-52-3					○	
728	Stoddard solvent	8052-41-3	⊙		○	P2RC		
729	Strontium chromate, as Cr	7789-06-2				P3R		
730	Strychnine	57-24-9				P3R		
731	Styrene, monomer	100-42-5	⊙		○			
732	Subtilisin	1395-21-7				P3R		
733	Sulfotep (TEDP)	3689-24-5			○	P3RC		
734	Sulfur dichloride	10545-99-0			○			
735	Sulfur dioxide	7446-09-5			○			
736	Sulfuric acid	7664-93-9			○	P3RC		
737	Sulfur pentafluoride	5714-22-7			○			

⊙ : Highly Recommended ○ : Recommended

	Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
			Gas Filter					
			A	K	ABEK	AX		
738	Sulfur tetrafluoride	7783-60-0					○	
739	Sulfur trioxide	7446-11-9			○	P2RC		
740	Sulfuryl chloride	7791-25-5			○			
741	Sulfuryl difluoride	2699-79-8					○	
<b>T</b>								
742	2,4,5-T (2,4,5-Trichlorophenoxy acetic acid)	93-76-5				P2R		
743	Tabun (GA)	77-81-6	⊙		○	P3RC		
744	Talc, containing no asbestos fibers	14807-96-6				P2R		
745	Tannic acid and tannins	1401-55-4				P2R		
746	Tantalum, metal	7440-25-7				P2R		
747	Tar fumes	—				P2R		
748	Tartaric acid	526-83-0				P2R		
749	Tellurium and compounds, as Te	13494-80-9				P3R		
750	Tellurium hexafluoride, as Te	7783-80-4					○	
751	Terpentine oil	—	⊙		○			
752	Terphenyls	26140-60-3				P2R		
753	1,1,2,2-Tetrabromoethane	79-27-6	⊙		○			
754	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746-01-6				P3R		
755	1,1,1,2-Tetrachloro-2,2-difluoroethane (FC-112a)	76-11-9	⊙		○	P2RC		
756	1,1,2,2-Tetrachloro-1,2-difluoroethane (FC-112)	76-12-0	⊙		○	P2RC		
757	1,1,2,2-Tetrachloroethane	79-34-5	⊙		○			
758	Tetrachloroethylene (Perchloroethylene)	127-18-4	⊙		○			
759	Tetrachloronaphthalene	1335-88-2				P2R		
760	Tetraethyl lead	78-00-2	⊙		○			
761	Tetraethyl pyrophosphate (TEPP)	107-49-3	⊙		○	P3RC		
762	Tetraethyl silicate	78-10-4	⊙		○			
763	Tetrahydrofuran	109-99-9	⊙		○			
764	Tetrahydrothiophene (THT)	110-01-0			○			
765	1,2,4,5-Tetramethylbenzene	95-93-2				P2R		
766	Tetramethyl lead	75-74-1	⊙		○			
767	Tetramethyl succinonitrile	3333-52-6	⊙		○	P3RC		
768	Tetranitromethane	509-14-8			○	P3RC		
769	1,3,6,8-Tetranitropyrene	28767-61-5				P2R		
770	Tetrasodium pyrophosphate	7722-88-5				P2R		
771	Tetryl (N-Methyl-N,2,4,6-tetranitroaniline)	479-45-8				P2R		
772	Thallium and soluble compounds, as	7440-28-0				P3R		
773	4,4'-Thiobis(6-tert-butyl-m-cresol)	96-69-5				P2R		
774	4,4'-Thiodianiline	139-65-1				P3R		
775	Thioglycolic acid	68-11-1			○			
776	Thionyl chloride	7719-09-7			○			
777	Thiourea	62-56-6				P2R		
778	Thiram	137-26-8				P3R		
779	Tin(IV) chloride	7646-78-8			○			
780	Titanium dioxide	13463-67-7				P3R		

⊙: Highly Recommended ○: Recommended

	Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
			Gas Filter					
			A	K	ABEK	AX		
781	Toluene (Toluol)	108-88-3	⊙		○			
782	Toluene-2,4-diisocyanate	584-84-9	⊙		○	P3RC		
783	Toluene-2,6-diisocyanate	91-08-7	⊙		○	P3RC		
784	p-Toluidine	106-49-0	⊙		○	P3RC		
785	Tributyl phosphate	126-73-8	⊙		○			
786	Tri-n-butyltin benzoate	4342-36-3	⊙		○	P2RC		
787	Tri-n-butyltin chloride	1461-22-9			○			
788	Tri-n-butyltin fluoride	1983-10-4				P3R		
789	Tri-n-butyltin linoleate	24124-25-2	⊙		○	P2RC		
790	Tri-n-butyltin methacrylate	2155-70-6	⊙		○	P2RC		
791	Tri-n-butyltin naphthenate	85409-17-2	⊙		○			
792	Trichloroacetic acid	76-03-9				P3R		
793	1,2,4-Trichlorobenzene	120-82-1	⊙		○	P2RC		
794	2,3,4-Trichloro-1-butene	2431-50-7	⊙		○			
795	1,1,2-Trichloroethane	79-00-5	⊙		○			
796	Trichloroethylene	79-01-6	⊙		○			
797	Trichloronaphthalene	1321-65-9				P2R		
798	1,2,3-Trichloropropane	96-18-4	⊙		○			
799	Tricyclohexyltin hydroxide	13121-70-5				P3R		
800	Tridymite	15468-32-3				P3R		
801	Triethanolamine	102-71-6	⊙		○	P2RC		
802	Triethylamine	121-44-8	⊙		○			
803	Triethylene tetramine	112-24-3	⊙		○			
804	Trimanganese tetraoxide	1317-35-7				P2R		
805	Trimellitic anhydride	552-30-7				P3R		
806	Trimethylamine	75-50-3				○		
807	2,4,5-Trimethylaniline	137-17-7				P2R		
808	1,2,3-Trimethyl benzene	526-73-8	⊙		○			
809	1,2,4-Trimethyl benzene	95-63-6	⊙		○			
810	1,3,5-Trimethyl benzene (Mesitylene)	108-67-8	⊙		○			
811	2,4,4-Trimethyl-1-pentene	107-39-1	⊙		○			
812	Trimethyl phosphate	512-56-1	⊙		○			
813	Trimethyl phosphite	121-45-9	⊙		○			
814	2,4,7-Trinitrofluorenone	129-79-3	⊙		○	P2RC		
815	2,4,6-Trinitrotoluene (TNT)	118-96-7				P3R		
816	1,3,6-Trinitropyrene	75321-19-6				P2R		
817	Tri-o-tolyl phosphate	78-30-8	⊙		○			
818	Tri-p-tolyl phosphate	78-32-0				P2R		
819	Triphenyl amine	603-34-9				P2R		
820	Triphenyl phosphate	115-86-6	⊙		○	P2RC		
821	Tungsten and insoluble compounds, as	7440-33-7				P2R		
822	Turpentine	8006-64-2	⊙		○			
<b>U</b>								
823	n-Undecane	1120-21-4	⊙		○			
824	Uranium, natural, soluble and insoluble	7440-61-1				P3R		
<b>V</b>								
825	Vanadium pentoxide, as V	1314-62-1				P3R		
826	Vinyl acetate	108-05-4	⊙		○			

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	Substance	CAS No.	Recommended Filter				Particle Filter	Airline or SCBA
			Gas Filter					
			A	K	ABEK	AX		
827	Vinyl chloride (Chloroethylene)	75-01-4				○		
828	Vinyl toluene	25013-15-4	⊙			○		
829	VM & P naphtha	8032-32-4	⊙			○		
830	VX (nerve agent)	50782-69-9	⊙			○	P3RC	
<b>W</b>								
831	Warfarin	81-81-2	⊙			○	P3RC	
832	Welding fumes	—					P3R	
833	White spirit	—	⊙			○		
834	Wood oil	—					P2R	
<b>X</b>								
835	o-Xylene	95-47-6	⊙			○		
836	m-Xylene	108-38-3	⊙			○		
837	p-Xylene	106-42-3	⊙			○	P2RC	
838	2,6-Xylenol (2,6-Dimethyl phenol)	576-26-1					P2R	
839	2,5-Xylenol (2,5-Dimethyl phenol)	95-87-4	⊙			○	P2RC	
840	2,4-Xylenol (2,4-Dimethyl phenol)	105-67-9					P2R	
841	2,3-Xylenol (2,3-Dimethyl phenol)	526-75-0					P2R	
842	3,4-Xylenol (3,4-Dimethyl phenol)	95-65-8	⊙			○	P2RC	
843	3,5-Xylenol (3,5-Dimethyl phenol)	108-68-9					P2R	
844	2,3-Xylidine	87-59-2	⊙			○	P3RC	
845	2,4-Xylidine	95-68-1	⊙			○	P2RC	
846	2,5-Xylidine	95-78-3	⊙			○	P2RC	
847	2,6-Xylidine	87-62-7	⊙			○	P3RC	
848	3,4-Xylidine	95-64-7	⊙			○	P3RC	
849	3,5-Xylidine	108-69-0	⊙			○	P3RC	
<b>Y</b>								
850	Yttrium and compounds, as Y	7440-65-5					P2R	
<b>Z</b>								
851	Zinc chloride, fume	7646-85-7					P2R	
852	Zinc chromates, as Cr	13530-65-9					P3R	
853	Zinc oxide, fume	1314-13-2					P2R	
854	Zinc sulfate	7733-02-0					P2R	
855	Zirconium compounds, as Zr	7440-67-7					P2R	

Types of filter used was decided by the working environment and characteristics of substance, as shown in table 1

Table 1.

Characteristics of Substance	Type of Filter
Substances with melting point over 50°C	Particle Filter
Substances with melting point between 0°C to 50°C, or Substances which may sublime	Particle and Gas Filter
Substances with melting point below 0°C	Gas Filter
Substances which has no recommended filter or Substance without test data	Airline or SCBA

Classes of filter used was decided by the hazardous substance, as shown in table 2

Table 2.

Hazardous Substance	Filter(s) Classifications
Carcinogenic substances <sup>(1)</sup>	P3
Substances which are listed in Poisonous and Deleterious Substances Control Law of Japan	P3
Substance of which TLV-TWA (Threshold Limit Values - Time-weighted average) is equal to or below 0.1mg / m <sup>3</sup>	P3
Substances other than the above	P2

<sup>(1)</sup> Guide to Occupational Exposure Value classified Carcinogenic substances into A1~A3 (ACGIH Guide to Occupational Exposure Values 2012) and/or 1~2B (IARC Monographs 2011)

