

# SCOTT®

## PRO2000 FILTERS

FOR RESPIRATORY PROTECTIVE EQUIPMENT



**SCOTT®**  
HEALTH & SAFETY

# SCOTT PRO2000 FILTERS



The Scott Pro2000 canister filter range offers a wide choice of filters for specific respiratory challenges, providing high quality and cost efficient protection. Highest specification filter media and materials ensure durability and reliability in the most demanding applications.

Combining low weight and low resistance, Scott Pro2000 filters are manufactured using superior performance media, giving extended adsorption capacity for gas and combined filters and unrivalled efficiency for the particle element.

Pro2000 filters are fully EN approved to the latest standards, marked 'R' for re-usable (EN 143:2000/ A1:2006), CE certified, and connect via a 40 mm EN148-1 thread. CE approvals : EN143, EN14387. CE0121.

## PRO2000 FILTERS

- Particle filters trap solid and liquid particles, e.g. dusts, smoke, welding fumes, mists, micro-organisms and radioactive particles.
- Gas filters protect against hazardous gases and vapours.
- Combined filters protect against both gaseous and particulate contaminants.

### Features of the particle filter

- Scott particle filters use only microfibre 'paper' media and do not use any electrostatic filtering methods, marked 'R' for re-usable (EN 143:2000/A1:2006).
- PF10 P3 features a high capacity filter element; trapping even the smallest particles with an efficiency 99,999 %.
- The filter element is extremely water-repellent.
- The vast intake area reduces the likelihood of clogging and resistance.

### Features of the gas filters

- Superior raw materials for best performance.
- The effective microporous structure of the carbon provides an extended area for adsorption.
- With a safe margin to EN requirements, Pro2000 gas filters perform effectively using only 220-320 ml of carbon.
- Less carbon provides low weight and less resistance – real benefits for the user.

## HOW TO SELECT A FILTER?

- Will the atmosphere contain sufficient oxygen (18-23 vol-%) throughout the period of exposure?
- Which hazardous substances are likely to be present?
- Which forms do the airborne contaminants take? Are they particles, gases or vapour or indeed a mixture of these?
- What effects can these substances have on the respiratory organs? Special attention is needed if there are several substances that may interact, either by reacting chemically, or by having synergistic adverse health effects.
- What are the concentrations in the atmosphere?
- Which are the relevant occupational exposure limits (OEL) or safe exposure levels?

### The level of protection required can be calculated as follows:

1. Divide the measured workplace concentration by the OEL-value of the substance
2. After that select the respirator, which has a protection factor superior to the required level of protection.

$$\text{Protection factor needed} = \frac{\text{Workplace concentration}}{\text{OEL value of the contaminant}}$$

### Protection factor needed?

|                        |   |
|------------------------|---|
| Contaminant:           | harmful airborne dust                       |
| Measured concentration | 5 mg/m <sup>3</sup> [time-weighted average] |
| OEL                    | 0.2 mg/m <sup>3</sup>                       |

The minimum protection factor needed:  $5/0.2 = 25$ .

Protection factor 25 is needed and as the calculated value for multiples of the limit show that half mask with P3-filter will provide adequate protection.

### What is the maximum permitted concentration of contaminant when using a full face mask with B2-gas filter?

|             |                             |
|-------------|-----------------------------|
| Contaminant | Chlorine (Cl <sub>2</sub> ) |
| OEL         | 1 ppm                       |

Full face mask with a gas filter has a workplace protection factor of 400, which means that full face mask is allowed to use in multiples of 400 x OEL concentration.

The max concentration can be calculated:  $400 \times 1 \text{ ppm (Cl}_2\text{)} = 400 \text{ ppm} = 0,04 \text{ vol.}\%$  of chlorine.



## PARTICLES

### Particle filter performance

The risk caused by particles depends on:

- The physical, biological and chemical properties of the contaminant
- Particle size and form
- Concentration in the ambient air, and exposure time
- Work pace; the more rapid respiration, the more particles are inhaled.

Scott particle filters use only microfibre 'paper' media and do not use any electrostatic filtering methods. Pro2000 filters are fully EN approved to the latest standards, marked 'R' for re-usable and CE marked.

### Particle filter capacity EN 143

| Class | Capacity   | Max permitted penetration |                                 | Limits of use<br>Max permitted exposure level                                    |
|-------|--|---------------------------|---------------------------------|--|
|       |  | NaCl (solid, dusts)       | Paraffin oil (liquid, aerosols) |  |
| P1    | Low capacity<br>(against coarse and minor solid particles)   | 20 %                      | 20 %                            | 4 x OEL-value  |
| P2    | Medium capacity<br>(against solid and liquid hazardous particles)  | 6 %                       | 6 %                             | 12 x OEL-value   |
| P3    | High capacity<br>(against solid and liquid toxic particles as well as radioactive particles and micro-organisms) | 0.05 %                    | 0.05 %                          | With a half mask<br>30 x OEL value.<br>With a full face mask<br>400 x OEL value. |

### Particle filter operation life

Filter does not wear out but gets clogged with particles and moisture. A particle filter must be replaced when breathing resistance has increased.

- When used against radioactive substances and micro-organisms a particle filter is recommended for single use only.

## GASES AND VAPOURS

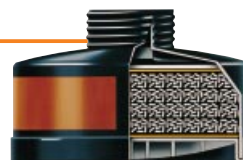
### Gaseous substances

Gaseous impurities have various effects on health:

- They can irritate the membranes of respiratory organs, the eyes and skin
- They can reach the lungs and cause damages
- They can be absorbed in the blood and cause temporary or permanent damage to various parts of the body
- They can cause irreparable damage to the nervous system
- The most hazardous gases can intoxicate or suffocate, and even destroy individual bodily organs
- They can be lethal

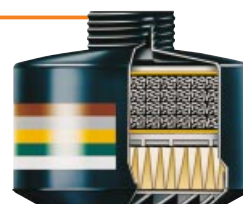
The consequences of the harmful gases depend on:

- The characteristics of the gas or vapour; its toxicity and substance
- The concentration of the contaminant in the air
- Duration of exposure to the contaminant
- The chemical compound of the contaminant
- The ability to react chemically with organic tissue as well as the propensity to be absorbed in the blood
- Personal characteristics e.g. rate of respiration, condition of the blood circulation and sensitivity of the person



## COMBINED FILTERS

Combined filters remove hazardous gases and vapours as well as solid and liquid particles. The particle filter traps aerosol-based particles such as paint droplets. When spraying liquid substances (e.g. spray painting) a combined filter must be used.



### Physiological effects of particulates on human body

|  |   |
|--|---|
| Inert dusts  | Minor effects of concentration: e.g. <math><5 \text{ mg/m}^3</math> slight irritation, > 30 mg/m <sup>3</sup> high irritation |
| Mineral dusts, e.g. silica dust, quartz  | Detrimental, hazardous effects: changes in lung tissues   |
| Metal fumes and dusts, e.g., lead, chromium, cadmium, mercury, poisonous particles | Pneumoconiosis, bronchitis, asthma, inflammation, cancer  |
| Manufactured fibres, e.g. asbestos and other fibres                                | Pulmonary fibrosis, mesothelioma, cancer  |
| Airborne radioactive substances  | can cause severe damages, e.g. cancer   |
| Micro-organisms, e.g. bacteria and viruses   | biological agents can cause hazardous diseases, e.g. farmer's lung  |

### How far particles penetrate depends on the particle size - the smaller size the more detrimental

| Particle size | Pulmonary tract               |
|---------------|-------------------------------|
| > 10 µm       | Membranes of nose and mouth   |
| > 5 ... 10 µm | Cilia, nose, trachea, bronchi |
| < 5 µm        | In the lungs, pleura          |
| < 1 µm        | Alveoli                       |

### Particle forms

- **Dusts** are airborne solid particles, which are generated during the processing of organic and inorganic substances. Solid particles can be mineral, metal, coal, wood, or crop dusts as well as various fibres.
- **Fumes**, evaporating metal creates fumes during cooling.
- **Smoke** consists of small coal and soot particles which include both liquid droplets and solid particles.
- **Mists** are airborne droplets which are created when a fluid disperses in air in form of small particles.
- **Micro-organisms**, e.g. bacteria and viruses.
- **Radioactive particles** are generated as a result of radiation.



### Gas filter classification EN 14387:2004

| Class   | Capacity        | Max gas concentration EN 14387. Negative pressure respirators | Max gas concentration. EN 12941 & 12942. Powered respirators |
|---------|-----------------|---|--|
| Class 1 | Low capacity    | 1000 ppm (0.1 %)  | 500 ppm (0.05 %)   |
| Class 2 | Medium capacity | 5000 ppm (0.5 %)  | 1000 ppm (0.1 %)   |
| Class 3 | High capacity   | 10 000 ppm (1%)*  | 5 000 ppm (0.5 %)  |

\*) **NOTE!** Test gas concentration with A-filter in class 3. is 0.8 vol% (EN 14387).

### Gas filter capacity EN 14387:2004

| Filter type | Test gas                                   | Minimum allowed breakthrough time for gases in different classes |          |                   |
|-------------|--|--|----------|-------------------|
|             |  | 1. class   | 2. class | 3. class          |
| A           | Cyclohexane C <sub>6</sub> H <sub>12</sub> | 70 min   | 35 min   | 65 min (0.8 vol%) |
| B           | Chlorine Cl <sub>2</sub>                   | 20 min   | 20 min   | 30 min            |
|             | Hydrogen sulphide H <sub>2</sub> S         | 40 min   | 40 min   | 60 min            |
|             | Hydrogen cyanide HCN                       | 25 min   | 25 min   | 35 min            |
| E           | Sulphur dioxide SO <sub>2</sub>            | 20 min   | 20 min   | 30 min            |
| K           | Ammonia NH <sub>3</sub>                    | 50 min   | 40 min   | 60 min            |

#### Special filters

| Filter type | Test gas  | Minimum allowed breakthrough time | Test gas concentration |
|-------------|---|-----------------------------------|------------------------|
| AX          | Dimethyl ether CH <sub>3</sub> -O-CH <sub>3</sub> | 50 min                            | 0.05 vol %             |
| Hg-P3       | Isobutane C <sub>4</sub> H <sub>10</sub>          | 50 min                            | 0.25 vol %             |
| [EN 14387]  | Mercury, vapour Hg                                | 100 hours                         | 1.6 ml/mg              |

### Gas filter capacity with powered air respirators EN 12941 and 12942

| Filter type | Test gas                                   | Minimum allowed breakthrough time for gas in different classes |          |          |
|-------------|--|--|----------|----------|
|             |  | 1. class   | 2. class | 3. class |
| A           | Cyclohexane C <sub>6</sub> H <sub>12</sub> | 70 min   | 70 min   | 35 min   |
| B           | Chlorine Cl <sub>2</sub>                   | 20 min   | 20 min   | 20 min   |
|             | Hydrogen sulphide H <sub>2</sub> S         | 40 min   | 40 min   | 40 min   |
|             | Hydrogen cyanide HCN                       | 25 min   | 25 min   | 25 min   |
| E           | Sulphur dioxide SO <sub>2</sub>            | 20 min   | 20 min   | 20 min   |
| K           | Ammonia NH <sub>3</sub>                    | 50 min   | 50 min   | 40 min   |

**NOTE!** The test gas concentrations are different from those of EN 14387.

## HOW LONG FILTER WORKS?

*The service life of a filter depends on:*

- Concentration and characteristics of the workplace contaminant
- Filter capacity, e.g. filter class, compare workplace concentrations to test values
- Breathing volume and work rate
- Humidity of the air
- Temperature of the atmosphere

### Gas filter test performance

Gas filter lifetime is tested by directing the test gas through the filter at 30 l/min, which is equivalent to the volume of air per minute used by an average person carrying out medium heavy work. The filter lifetime can be roughly calculated by comparing the concentration at the workplace and the minimum breakthrough times required for the filter type.

#### How to calculate lifetime of a gas filter?

$$T = \frac{1\,000\,000 \times G}{V \times C}$$

T = Time in minutes

G = Capacity of the gas filter to absorb impurities (g)

V = Breathing rate (l/min)

C = Concentration of the contaminant in the ambient air

# PRO2000 FILTERS



PF10 P3



GF 22 A2



GF 22 B2



GF 32 E2



GF 22 K2



GF 22 A2B2



GF 32 A2B2E2K2



GF 32 AX



CF 22 A2-P3



CF 22 B2-P3



CF 32 E2-P3



CF 22 K2-P3



CF 22 A2B2-P3



CF 22 A2B2E1-P3



CF 32 A2B2E2K2-P3



CFR 32 A2B2E2K2-P3



CF 32 AX-P3



CF 32 Reactor-Hg-P3



CF 22 A1E1Hg-P3



CF 32 A2B2E2K2-Hg-P3

| Colour code | Filter                   | Main area of application   | Weight g | Ref. nr | Storage time Years |
|-------------|--------------------------|--|----------|---------|--------------------|
|             | PF10 P3 R                | Solid and liquid particles of toxic agents, radioactive substances and micro-organisms, e.g. bacteria and viruses.   | 74       | 052670  | 10                 |
|             | *) PFR10 P3 R            | Solid and liquid particles of toxic agents, radioactive substances and micro-organisms, e.g. bacteria and viruses.   | 90       | 052680  | 10                 |
|             | GF22 A2                  | Gases and vapours from organic compounds (e.g. solvents) with a boiling point above 65°C.  | 190      | 042870  | 5                  |
|             | GF22 B2                  | Inorganic gases and vapours, e.g. chlorine, hydrogen sulphide, hydrogen cyanide.   | 195      | 042871  | 5                  |
|             | GF32 E2                  | Acid gases and vapours, e.g. sulphur dioxide.  | 305      | 042972  | 5                  |
|             | GF22 K2                  | Ammonia and organic ammonia derivatives.   | 255      | 042873  | 5                  |
|             | GF22 A2B2                | Organic and inorganic gases and vapours.   | 195      | 042874  | 5                  |
|             | GF32 A2B2E2K2            | Organic, inorganic and acid gases and vapours as well as ammonia and organic ammonia derivatives.  | 320      | 042979  | 5                  |
|             | GF32 AX                  | Gases and vapours from organic compounds with a boiling point below 65°C.  | 268      | 042970  | 5                  |
|             | CF22 A2-P3 R             | Gases and vapours from organic compounds with a boiling point above 65 °C, solid and liquid hazardous particles, e.g. radioactive and toxic substances and micro-organisms, e.g. bacteria and viruses.   | 230      | 042670  | 5                  |
|             | CF32 A2-P3 R             | Gases and vapours from organic compounds with a boiling point above 65 °C, solid and liquid hazardous particles, e.g. radioactive and toxic substances and micro-organisms, e.g. bacteria and viruses.   | 340      | 043070  | 5                  |
|             | CF22 B2-P3 R             | Inorganic gases and vapours, e.g. chlorine, hydrogen sulphide, hydrogen cyanide, solid and liquid hazardous particles, e.g. radioactive and toxic substances and micro-organisms, e.g. bacteria and viruses.                                       | 265      | 042671  | 5                  |
|             | CF32 E2-P3 R             | Acid gases and vapours e.g. sulphur dioxide, solid and liquid hazardous particles, e.g. radioactive and toxic substances and micro-organisms, e.g. bacteria and viruses.   | 265      | 043072  | 5                  |
|             | CF22 K2-P3 R             | Ammonia and organic ammonia derivatives, solid and liquid hazardous particles, e.g. radioactive and toxic substances and micro-organisms, e.g. bacteria and viruses.   | 370      | 042673  | 5                  |
|             | CF22 A2B2-P3 R           | Organic and inorganic gases and vapours, solid and liquid hazardous particles, e.g. radioactive and toxic substances and micro-organisms, e.g. bacteria and viruses.   | 265      | 042674  | 5                  |
|             | CF22 A2B2E1-P3 R         | Organic, inorganic and acid gases and vapours, solid and liquid hazardous particles, e.g. radioactive and toxic substances and micro-organisms, e.g. bacteria and viruses.   | 270      | 042678  | 5                  |
|             | CF32 A2B2E2K2-P3 R       | Organic, inorganic and acid gases and vapours as well as ammonia and organic ammonia derivatives, solid and liquid hazardous particles, e.g. radioactive and toxic substances and micro-organisms, e.g. bacteria and viruses.                      | 370      | 042799  | 5 **)              |
|             | *) CFR32 A2B2E2K2-P3 R   | Organic, inorganic and acid gases and vapours as well as ammonia and organic ammonia derivatives, solid and liquid hazardous particles, e.g. radioactive and toxic substances and micro-organisms, e.g. bacteria and viruses.                      | 370      | 043699  | 5                  |
|             | CF32 AX-P3 R             | Gases and vapours from organic compounds with a boiling point below 65°C, solid and liquid hazardous particles, e.g. radioactive and toxic substances and micro-organisms, e.g. bacteria and viruses.  | 310      | 042770  | 5                  |
|             | CF32 Reactor-Hg-P3 R     | Mercury and mercury compounds, radioactive iodine and its organic compounds like methyl iodide, solid and liquid hazardous particles, e.g. radioactive and toxic substances and micro-organisms, e.g. bacteria and viruses.                        | 307      | 042777  | 5                  |
|             | *) CFR32 Reactor-Hg-P3 R | Mercury and mercury compounds, radioactive iodine and its organic compounds like methyl iodide, solid and liquid hazardous particles, e.g. radioactive and toxic substances and micro-organisms, e.g. bacteria and viruses.                        | 328      | 043679  | 5                  |
|             | CF22 A1E1Hg-P3 R         | Organic and acid gases and vapours, mercury and mercury compounds plus ozone, solid and liquid hazardous particles, e.g. radioactive and toxic substances and micro-organisms, e.g. bacteria and viruses.  | 268      | 042778  | 5                  |
|             | CF32 A2B2E2K2-Hg-P3 R    | Organic, inorganic and acid gases and vapours, ammonia and organic ammonia derivatives, mercury and mercury compounds, solid and liquid hazardous particles, e.g. radioactive and toxic substances and micro-organisms, e.g. bacteria and viruses. | 370      | 042798  | 5                  |

\*) PFR and CFR = Reduced opening

\*\*) In aluminium foil package and/or plugged 10 y.

# FILTER GUIDE

## Explanations

Use **air-line** = compressed air-line is recommended

Use **SCBA** = due to the dangerous nature of the hazard use Self Contained Breathing Apparatus

## Note!

This filter recommendation is applicable only to Scott Health & Safety filters and should not be used if other filters are used.

Before use of this guide the risk assessment must be done at the workplace. The substances must be identified and measured. Airborne con-

mination levels must be compared with acceptable limits. The maximum exposure limits must not be exceeded! The filtering device must not be used if the environment and contamination are unknown or if the composition of the atmosphere is likely to change disadvantageously. In case of doubt, insulating respirators which function independently from the atmosphere must be used. The filtering

device may be used only if the oxygen content of the air is 18-23 vol. %. Gas filters do not protect against particles. Similarly, particle filters do not provide protection against gases or vapour. In case of doubt, use combined filters. Normal filtering device do not protect against certain gases such as CO (carbon monoxide), CO<sub>2</sub> (carbon dioxide) and N<sub>2</sub> (nitrogen).

| Substance                           | Filter recommendation | Substance                                  | Filter recommendation | Substance  | Filter recommendation | Substance  | Filter recommendation |
|-------------------------------------|-----------------------|--|-----------------------|--|-----------------------|--|-----------------------|
| <b>A</b>                            |                       | <b>B</b>                                   |                       | Camphor, synthetic                                 | A-P3                  | Copper fume, dusts & mists (as Cu)                                       | P3                    |
| Acetaldehyde                        | AX                    | BGE  | A                     | e-Caprolactam                                      | A-P3                  | Cotton dust, raw   | P3                    |
| Acetic acid                         | A-P3                  | γ-BHC (ISO)                                | A-P3                  | Captafol (ISO)                                     | A-P3                  | Cresols all isomers  | A-P3                  |
| Acetic anhydride                    | A                     | Barium compounds                           | P3                    | Captan (ISO)                                       | A-P3                  | Cristobalite   | P3                    |
| Acetone                             | AX                    | Benomyl (ISO)                              | A-P3                  | Carbaryl (ISO)                                     | A-P3                  | Crotonaldehyde   | A                     |
| Acetonitrile                        | A                     | Benzene                                    | A                     | Carbofuran (ISO)                                   | A-P3                  | Cumene   | A                     |
| Acetylene                           | Use air-line          | Benzenethiol                               | A                     | Carbon black                                       | P3                    | Cyanamide  | B-P3                  |
| o-Acetylsalicylic acid              | P3                    | Benzene -1,2,4-tri-carboxylic acid         |                       | Carbon dioxide                                     | Use air-line          | Cyanides, except hydrogen cyanide, cyanogens & cyanogenchloride, (as CN) | B-P3                  |
| Acrolein (2-propenal)               | AX                    | 1,2 anhydride                              | A-P3                  | Carbon disulfide                                   | B-P3                  | Cyanogen   | Use air-line          |
| Acrylaldehyde                       | AX                    | Benzidine salts                            | A-P3                  | Carbon monoxide                                    | Use air-line          | Cyanogen chloride  | Use air-line          |
| Acrylamide                          | A-P3                  | Benzidine                                  | A-P3                  | Carbon tetrabromide                                | A-P3                  | Cyclohexane  | A                     |
| Acryl acid                          | A, E                  | p-Benzoquinone                             | A-P3                  | Carbon tetrachloride                               | A                     | Cyclohexanol   | A                     |
| Acrylamide                          | A-P3                  | Benzoyl peroxide                           | A-P3                  | Carbonyl chloride (phosgene)                       | B-P3                  | Cyclohexanone  | A                     |
| Acrylonitrile                       | A                     | Benzyl butyl phtalate                      | A-P3                  | Carbonyl fluoride                                  | B                     | Cyclohexene  | A                     |
| Aldrin                              | A-P3                  | Benzyl chloride                            | B-P3                  | Catechol (Pyrocatechol)                            | A-P3                  | Cyclohexylamine  | A                     |
| Allyl alcohol                       | A                     | Beryllium compounds                        | Use SCBA              | Cellulose  | P3                    | Cyclonite (RDX)  | B-P3                  |
| Allylamine                          | K                     | Biphenyl                                   | A-P3                  | Chlorane   | P3                    | 1,3 Cyclopentadiene  | AX                    |
| Allylbromine                        | (B or AX)             | Bismuthtelluride                           | P3                    | Chlordane (ISO)                                    | A-P3                  | <b>D</b>   |                       |
| Allyl 2,3-epoxypropyl ether         | A                     | Bismuthtelluride, Se-doped                 | P3                    | Chlorinated biphenyls                              | A-P3                  | 2,4-D (2,4-Dichlorophenoxy acetic acid)                                  | A-P3                  |
| Allyl chloride                      | A                     | Borates, (Tetra) sodium salts              | P3                    | Chlorine   | B                     | DDT  |                       |
| Allyl glycidyl ether (AGE)          | A                     | Bornan-2-one                               | A-P3                  | Chlorine dioxide                                   | B                     | (Dichlorodiphenyl-trichloroethane)                                       | A-P3                  |
| Allyl-isocyanate                    | A2B2-P3               | Boron oxide                                | P3                    | Chlorine trifluoride                               | B                     | DDVP, see Dichlorvos   | A-P3                  |
| Allyl propyl disulfide              | B                     | Boron tribromide                           | Use air-line          | Chloroacetaldehyde                                 | A                     | Decaborane   | B-P3                  |
| Aluminium alkyl compounds           | P3                    | Boron trifluoride                          | Use air-line          | a-Chloroacetophenone (Phenacyl chloride) (CN)      | A-P3                  | Demeton  | A-P3                  |
| Aluminium chloride                  | AX                    | Bromacil (ISO)                             | A-P3                  | Chloroacetyl chloride                              | A-P3                  | Diacetone alcohol  | A                     |
| Aluminium metal and oxide           | P3                    | Bromine                                    | B-P3                  | Chlorobenzene (Monochlorobenzene)                  | A                     | 1,2-Diaminoethane  | A, K                  |
| Aluminium welding fumes             | P3                    | Bromine pentafluoride                      | Use air-line          | o-Chlorobenzylidene malononitrile (CS)             | A-P3                  | Diazinon   | A-P3                  |
| Aluminium, soluble salts            | P3                    | Bromochloromethane                         | AX                    | 2-Chlorobuta-1, 3-diene                            | AX-P3                 | Diazomethane   | B-P3                  |
| 4-Aminoazobenzene                   | A-P3                  | Bromoethane                                | AX                    | Chlorodimethyl ether                               | AX                    | Diborane   | Use air-line          |
| 4-Aminodiphenyl salts               | Use SCBA              | Bromoethylene                              | AX                    | 1-Chloro-2, 3-epoxypropane (Epichlorohydrin)       | A                     | 1,2-Dibromoethane  | A                     |
| 2-Aminoethanol                      | A                     | Bromoforn                                  | A                     | Chloroethane                                       | AX                    | 2-n-Dibutylaminoethanol  | A                     |
| 2-Aminopyridine                     | A-P3                  | Bromomethane                               | AX                    | 2-Chloroethanol (Ethylene chlorohydrin)            | A                     | Dibutyl phosphate  | A-P3                  |
| 3-Amino-1,2,4-triazole              | A                     | 1,3-Butadiene                              | AX                    | Chloroethylene                                     | A                     | Dibutyl phthalate  | A-P3                  |
| Ammonia                             | K                     | Butane                                     | AX                    | Chloroform   | A                     | Dichloracetylene   | Use SCBA              |
| Ammonium chloride fume              | K-P3                  | Butanethiol                                | B                     | (Trichloromethane)                                 | AX                    | 1,2-Dichlorobenzene  | A                     |
| Ammonium sulfamate (Ammate)         | P3                    | 2-Butanone                                 | A                     | bis-Chloromethyl ether                             | B                     | 1,4-Dichlorobenzene  | A                     |
| n-Amyl acetate                      | A                     | 2-Butoxyethanol (Butyl cellosolve)         | A-P3                  | 1-Chloro-1-nitropropane                            | B                     | 3,3'-Dichlorobenzidine   | Use air-line          |
| sec-Amyl acetate                    | A                     | Butyl acetate                              | A                     | Chloropicrin (PS)                                  | A                     | 1,3-Dichloro-5, 5-dimethyl hydantoin                                     | ABE-P3                |
| Aniline & homologues                | A                     | tert-Butyl acetate                         | A                     | β-Chloroprene                                      | AX-P3                 | 1,1-Dichloroethane   | AX                    |
| Anisidine, o-, p-isomers            | A-P3                  | Butyl acrylate                             | A                     | o-Chlorostyrene                                    | A                     | 1,2-Dichloroethane   | A                     |
| Antimony and compounds (as SB)      | P3                    | n-Butyl alcohol                            | A                     | 2-Chlorotoluene                                    | B-P3                  | Dichloroethyl ether  | A                     |
| Antimony trioxide                   | P3                    | sec-Butyl alcohol                          | A                     | 2-Chloro-6-(trichloromethyl) pyridine              | A-P3                  | Dichloromethane  | AX                    |
| p-Aramid respirable fibres          | P3                    | N-Butylamine                               | A                     | Chlorpyrifos (ISO)                                 | A-P3                  | 1,1-Dichloro-1-nitroethane   | A                     |
| Argon                               | Use air-line          | tert-Butyl chromate (as CrO <sub>3</sub> ) | P3                    | Chromates, certain insoluble forms                 | P3                    | 1,2-Dichloropropane  | A                     |
| Arsenic & compounds (except Arsine) | P3                    | n-Butylglycidyl ether                      | A                     | Chromic acid and Chromates (as Cr)                 | P3                    | Dichloropropene  | A                     |
| Arsenic trioxide                    | P3                    | n-Butyl lactate                            | A-P3                  | Chromite (chromate) (as Cr)                        | P3                    | 2,2-Dichloropropionic acid   | A                     |
| Arsine                              | Use air-line          | 2-sec Butylphenol                          | A                     | Chromium, sol. chromic, chromous salts (as Cr)     | P3                    | Dichlorvos (DDVP) (ISO)  | A-P3                  |
| Asbestos                            | P3                    | p-tert Butyltoluene                        | A                     | Coal dust in mines                                 | A-P3                  | Dicyclohexyl phthalate   | A-P3                  |
| Asphalt (petroleum fumes)           | A-P3                  | <b>C</b>                                   |                       | Coal tar pitch volatiles (as cyclohexane solubles) | A-P3                  | Dicyclopentadiene  | A-P3                  |
| Atrazine                            | P3                    | Cadmium, dust & salts (as Cd)              | P3                    | Cobalt metal, dust and fume (as Co)                | P3                    | Dicyclopentadienyliiron  | A-P3                  |
| Azinphos-methyl (ISO)               | A-P3                  | Cadmium oxide                              |                       |  |                       | Dieldrin (ISO)   | A-P3                  |
| Aziridine                           | ABEK                  | Cadmium oxide fume (as Cd)                 | P3                    |  |                       | Diethylamine   | K                     |
|                                     |                       | Caesium hydroxide                          | P3                    |  |                       |  |                       |
|                                     |                       | Calcium carbonate                          | P3                    |  |                       |  |                       |
|                                     |                       | Calcium cyanamide                          | P3                    |  |                       |  |                       |
|                                     |                       | Calcium hydroxide                          | P3                    |  |                       |  |                       |
|                                     |                       | Calcium oxide                              | P3                    |  |                       |  |                       |

|  |               |  |                 |   |                 |  |                               |
|--|---------------|--|-----------------|---|-----------------|--|-------------------------------|
| 2-Diethylaminoethanol                                | K             | Fluoride (as F)                            | P3              | Lithium hydride                                   | P3              | Neon                                     | Use<br>air-line               |
| Diethylene triamine                                  | A-P3,<br>K-P3 | Fluorine                                   | B               | Lithium hydroxide                                 | P3              | Nickel and inorganic<br>compounds        | P3                            |
| Diethyl ether  | AX            | Formaldehyde                               | AX, B, E        | <b>M</b>  |                 | Nickel and organic<br>compounds (as Ni)  | A-P3                          |
| Diethyl phthalate                                    | A-P3          | Formamide                                  | A-P3            | Magnesium oxide<br>fume (as Mg)                   | P3              | Nicotine                                 | A-P3                          |
| Difluorodibromo-<br>methane                          | AX            | Formic acid                                | E-P3            | Malathion   | A-P3            | Nitrapyrin                               | A-P3                          |
| Diglycidyl ether                                     | A-P3          | Fuel oils (various)                        | A-P3            | Maleic anhydride                                  | A-P3            | Nitric acid                              | E-P3                          |
| o-Dihydroxybenzene                                   | A-P3          | Furfural                                   | A               | Manganese &<br>compounds (as Mn)                  | P3              | 4-Nitroaniline                           | AB-P3                         |
| Diisobutyl ketone                                    | A             | Furfuryl alcohol                           | A               | Manganese fume (as Mn)                            | P3              | Nitrobenzene                             | A-P3                          |
| Diisopropylamine                                     | K             | <b>G</b>                                   |                 | Manganese<br>cyclopentadienyl<br>tricarbonyl      | A-P3<br>P3      | 4-Nitrobiphenyl                          | P3                            |
| Dimethoxymethane                                     | AX            | Gasoline                                   | A               | Manganese tetraoxide                              | P3              | Nitroethane                              | A-P3,<br>(B-P3)               |
| N,N-Dimethyl<br>acetamide                            | A             | Germanium                                  | Use<br>air-line | Mercury alkyls (as Hg)                            | Hg-P3           | Nitrogen dioxide                         | BE                            |
| Dimethylamine  | K             | Glass, fibrous or dust                     | P3              | Mercury & its<br>inorganic divalent<br>compounds  | Hg-P3           | Nitrogen trifluoride                     | Use<br>air-line               |
| Dimethylaminobenzene                                 | A             | Glutaraldehyde                             | A-P3            | Mesitylene  | A               | Nitroglycerin                            | A-P3                          |
| N,N-Dimethylaniline                                  | A             | Glyserol, mist                             | A-P3            | Mesityl oxide                                     | A               | Nitromethane                             | A-P3                          |
| Dimethylbenzene                                      | A             | Glyserol trinitrate                        | A-P3            | Methacrylic acid                                  | A-P3            | 1-Nitropropane                           | A-P3                          |
| Dimethylcarbonyl<br>chloride                         | A-P3          | Glycol ethers                              | A               | Methacrylonitrile                                 | AB-P3           | 2-Nitropropane                           | A-P3                          |
| Dimethyl ether                                       | AX            | <b>H</b>                                   |                 | Methane   | Use<br>air-line | n-Nitrosodimethylamine                   | A-P3                          |
| NN-Dimethylethylamine                                | K             | Hafnium                                    | P3              | Methanethiol, see<br>Methyl mercaptan             | B               | Nitrotoluene                             | A-P3                          |
| Dimethylformamide                                    | A             | Helium                                     | Use<br>air-line | Methanol  | AX              | Octachloronaphthalene                    | A-P3                          |
| 1,2-Dimethyl-<br>hydrazine                           | K             | Heptan-2-one                               | A               | Methomyl (ISO)                                    | P3              | n-Octane                                 | A                             |
| Dimethyl phthalate                                   | P3            | Heptan-3-one                               | A               | Methoxychlor (ISO)                                | P3              | Oil mist, mineral                        | P3                            |
| Dimethyl sulphate                                    | AP3           | Hexachlorobenzene                          | A               | 2-Methoxyethanol<br>(Methyl cellosolve)           | A               | Osmium tetroxide<br>(as Os)              | B-P3                          |
| Dinitrobenzene                                       | A-P3          | Hexachlorocyclo-<br>pentadiene             | A               | Methyl acetate                                    | AX              | Oxalic acid                              | P3                            |
| Dinitro-o-cresol                                     | B-P3          | Hexachloroethane                           | A-P3            | Methyl acrylate                                   | A               | Oxygen difluoride                        | B                             |
| 1,4-Dioxane  | A-P3          | Hexamethyl diisocyanate                    | A2B2-P3         | Methyl alcohol                                    | A               | Ozone                                    | Reactor-Hg-P3<br>or A1E1Hg-P3 |
| Dioxathion (ISO)                                     | A-P3          | Hexamethyl-<br>phosphoramidate             | A-P3            | (Methanol)  | AX              | <b>P</b>                                 |                               |
| Diphenylamine  | A-P3          | Hexane (n-hexane)                          | A               | Methylamine                                       | K               | Paraffin wax fume                        | A-P3                          |
| Diphenylmethane<br>diisocyanate (MDI)                | A2B2-P3       | 2-Hexanone                                 | A               | Methyl amyl alcohol                               | A               | Paraquat dichloride (ISO)                | A-P3                          |
| Dipropylene glycol<br>methyl ether                   | A             | Hexone                                     | A               | Methyl n-amyl ketone<br>(2-Heptanone)             | A               | Parathion (ISO)                          | A-P3                          |
| Diquat Dibromide (ISO)                               | P3            | Hexylene glycol                            | A               | Methyl bromide                                    | AX              | Pentachlorophenol                        | A-P3                          |
| Disulfoton   | ABE-P3        | Hydrazine                                  | K-P3            | Methyl t-butyl ether                              | AX              | Pentane, all isomers                     | AX                            |
| 2,6-Di-tert-butyl-<br>para-cresol                    | P3            | Hydrazine salts                            | K-P3            | Methyl butyl ketone                               | A               | Perchloroethylene                        | A                             |
| Diuron (ISO)   | P3            | Hydrazobenzene                             | ABEK-P3         | Methyl chloroform<br>(1,1,1-Trichloro-<br>ethane) | A               | Perchloromethyl<br>mercaptan             | B                             |
| Divinyl benzene                                      | A             | Hydrocarbon solvents                       | A-P3            | Methyl cyclohexane                                | A               | Perchloryl fluoride                      | B                             |
| <b>E</b>   |               | Hydrogenated<br>terphenyls                 | A-P3            | Methylcyclohexanol                                | A               | Phenyl chloride                          | A-P3                          |
| Emery  | P3            | Hydrogen bromide                           | B-P3            | 2-Methylcyclo-<br>hexanone                        | A               | Phenol                                   | A-P3                          |
| Endosulfan (ISO)                                     | P3            | Hydrogen chloride                          | B-P3            | Methylene bisphenyl<br>diisocyanate (MDI)         | A2B2-P3         | n-Phenyl-β-<br>Naphthylamine             | A-P3                          |
| Endrin (ISO)   | P3            | Hydrogen cyanide                           | B-P3            | 4,4'-Methylene-bis<br>(2-chloroaniline)           | A2B2-P3         | p-Phenylenediamine                       | P3                            |
| Epichlorohydrin                                      | A             | Hydrogen fluoride (as F)                   | E-P3            | MbOCA   | A2B2-P3         | Phenyl ether<br>(vapour)                 | A                             |
| 1,2-Epoxypropane                                     | AX            | Hydrogen peroxide                          | B-P3            | Methylene bis<br>(4-cyclohexyliso-<br>cyanate)    | A2B2-P3         | Phenyl ether-Diphenyl<br>mixture (vapor) | A-P3                          |
| 2,3-Epoxy-1-propanol                                 | A             | Hydrogen sulfide                           | B               | 4,4'-Methylene-bis<br>(2-chloroaniline)           | A2B2-P3         | Phenyl glycidyl<br>ether (PGE)           | A                             |
| Ethanethiol  | AX, B         | Hydroquinone                               | A-P3            | Methyl methacrylate                               | A               | Phenyl hydrazine                         | A                             |
| 2-Ethoxyethanol                                      | A             | 2-Hydroxypropyl<br>acrylate                | A               | Methyl methacrylate<br>peroxideS (MEKP)           | A-P3            | Phenyl mercaptan                         | B                             |
| 2-Ethoxyethyl acetate<br>(Cellosolve acetate)        | A             | <b>I</b>                                   |                 | Methyl formate                                    | AX              | Phenyl phosphine                         | B                             |
| Ethyl acetate  | A             | IGE (2,3-Epoxypropyl<br>isopropyl ether)   | A               | Methyl hydrazine                                  | K               | Phorate                                  | A-P3                          |
| Ethyl acrylate                                       | A             | Indene                                     | A               | Methyl iodide                                     | AX              | Phosdrin (Mevinphos)                     | A-P3                          |
| Ethyl alcohol (Ethanol)                              | A             | Indium &<br>Compounds (as In)              | P3              | Methyl isoamyl ketone                             | A               | Phosgene<br>(carbonyl chloride)          | B-P3                          |
| Ethylamine   | K             | Iodine                                     | B-P3            | Methyl isocyanate                                 | A2B2-P3         | Phosphine                                | B                             |
| Ethyl amyl ketone<br>(5-Methyl-3-heptanone)          | A             | Iodoform                                   | A-P3            | Methyl parathion                                  | A-P3            | Phosphoric acid                          | P3                            |
| Ethylbenzene   | A             | Iodomethane                                | AX              | Methyl propyl ketone                              | A               | Phosphorous (yellow)                     | P3                            |
| Ethyl bromide  | AX            | Iron oxide, fume (as FE)                   | P3              | Methyl silicate                                   | A               | Phosphorus pentachloride                 | B-P3                          |
| Ethyl butyl ketone<br>(3-heptanone)                  | A             | Iron pentacarbonyl                         | A-P3            | a-Methylstyrene                                   | A               | Phosphorus pentasulfide                  | B-P3                          |
| Ethyl chloride                                       | AX            | Iron salts                                 | P3              | Mevinphos (ISO)                                   | A-P3            | Phosphorus trichloride                   | B-P3                          |
| Ethylene chlorohydrin                                | A             | Isoamyl acetate                            | A               | Molybdenum (as Mo)                                | P3              | Phthalic anhydride                       | A-P3                          |
| Ethylene glycol                                      | A-P3          | Isoamyl alcohol                            | A               | Monochloroacetic acid                             | A-P3            | Picloram (ISO)                           | AB-P3                         |
| Ethylene glycol<br>dinitrate and/or<br>Nitroglycerin | A             | Isobutane                                  | AX              | Monomethyl aniline                                | A               | Picric acid                              | P3                            |
| Ethylene glycol mono-<br>ethyl ether acetate         | A             | Isobutyl acetate                           | A               | Morpholine  | A               | Platinum<br>(Soluble salts) (as Pt)      | P3                            |
| Ethylene oxide                                       | AX            | Isobutyl alcohol                           | A               | <b>N</b>  |                 | Polychlorinated<br>biphenyls (PCB's)     | A-P3                          |
| Ethylenimine   | K             | Isopropylamine                             | B               | Naphthalene                                       | A-P3            | Polyvinyl chloride (PVC)                 | P3                            |
| Ethyl ether  | AX            | n-Isopropylaniline                         | A               | 2-Naphthylamine                                   | A-P3            | Potassium hydroxide                      | P3                            |
| Ethyl formate  | AX            | Isopropyl benzene<br>(as Cumene)           | A               |   |                 | n-Propanol                               | A                             |
| Ethyl mercaptan                                      | AX            | Isopropyl ether                            | A               |   |                 | Propargyl alcohol                        | A                             |
| 4-Ethylmorpholine                                    | A-P3          | Isopropyl glycidyl ether                   | A               |   |                 | Propiolactone                            | A-P3                          |
| Ethyl silicate                                       | A             | <b>L</b>                                   |                 |   |                 | Propionic acid                           | A-P3                          |
| <b>F</b>   |               | Lead and compounds<br>(except lead alkyls) | P3              |   |                 | n-Propyl acetate                         | A                             |
| Fenchlorofoss (ISO)                                  | A-P3          | Lead alkyls                                | A-P3            |   |                 | Propyl alcohol                           | A                             |
| Ferbam (ISO)   | P3            | Lindane                                    | A-P3            |   |                 | Propylene                                | Use<br>air-line               |
| Ferrocene (ISO)                                      | A-P3          |  |                 |   |                 |  |                               |
| Ferrovanadium dust                                   | P3            |  |                 |   |                 |  |                               |
| Flour dust   | P3            |  |                 |   |                 |  |                               |

| Substance  | Filter recommendation | Substance                               | Filter recommendation | Substance                                      | Filter recommendation | Substance                                     | Filter recommendation |
|--|-----------------------|---|-----------------------|--|-----------------------|---|-----------------------|
| Propylene glycol                                       | A                     | Styrene                                 | A                     | Tetryl (2,4,6-trinitrophenyl-methyl-nitramine) | P3                    | <b>V</b>                                      |                       |
| Propylene glycol dinitrate                             | A-P3                  | Subtilisins (Proteolytic enzymes)       | P3                    | Thallium, soluble compounds (as TI)            | P3                    | Vanadium pentoxide                            | P3                    |
| Propylene oxide  | AX                    | Sulfur dioxide                          | E                     | 4,4'-Thiobis (6-tert-butyl-m-cresol)           | P3                    | Vinyl acetate                                 | A                     |
| PyrethrINS (ISO)                                       | P3                    | Sulfuric acid                           | E-P3                  | Thioglycolic acid                              | A-P3                  | Vinyl benzene                                 | A                     |
| Pyridine   | A-P3                  | Sulfur monochloride                     | B-P3                  | Toluene (Toluol)                               | A                     | Vinyl bromide                                 | A                     |
| Pyrocatechol   | A-P3                  | Sulfur pentafluoride                    | B-P3                  | Toluene-2, 4-diisocyanate (TDI)                | A2B2-P3               | Vinyl chloride                                | AX                    |
| <b>Q</b>   |                       | Sulfur tetrafluoride                    | Use                   | o-Toluidine                                    | A-P3                  | Vinylidene chloride                           | AX-P3                 |
| Quartz   | P3                    | Sulfuryl difluoride                     | Use                   | Tributyl phosphate                             | A-P3                  | Vinyl toluene                                 | A                     |
| Quinone  | A-P3                  | 2,4,5-T (ISO)                           | air-line<br>P3        | 1,2,4-Trichlorobenzene                         | A                     | VM & P Naphtha                                | A                     |
| <b>R</b>   |                       | <b>T</b>                                |                       | 1,1,1-Trichloroethane                          | A                     | VX  | B-P3                  |
| Resorcinol   | A-P3                  | Tabun (GA)                              | B-P3                  | Trichloroethylene                              | A-P3                  | <b>W</b>                                      |                       |
| Rhodium (as RH) metal fume and dust                    | P3                    | Tantalum                                | P3                    | Trichloromethane                               | AX                    | Warfarin (ISO)                                | P3                    |
| Rosin core solder pyrolysis products (as formaldehyde) | B-P3                  | TEDP                                    | AB-P3                 | 1,2,3-Trichloropropane                         | A                     | Welding fume                                  | P3                    |
| <b>S</b>   |                       | Tellurium & compounds (as Te)           | P3                    | 2,4,6-Trinitrotoluene (TNT)                    | P                     | White spirit                                  | A                     |
| Sarin (GB)   | ABE-P3                | Tellurium hexafluoride (as Te)          | Use<br>SCBA           | Tri-cyclohexyltin hydroxide                    | A-P3                  | <b>X</b>                                      |                       |
| Selenium compounds (as Se)                             | P3                    | Terphenyls                              | A-P3                  | Triethylamine                                  | A, K                  | Xylene (all isomers)                          | A                     |
| Silica dust  | P3                    | 1,1,1,2-Tetrachloro-2,2-difluoroethane  | A                     | Trimethyl benzene                              | A                     | Xylidine, all isomers                         | AK                    |
| Silver, metal  | P3                    | 1,1,2,2,-Tetrachloro-1,2-difluoroethane | A                     | Trimethyl phosphite                            | A-P3                  | <b>Y</b>                                      |                       |
| Silver soluble compounds (as Ag)                       | P3                    | 1,1,2,2,-Tetrachloro, ethane            | A                     | 2,4,6-Trinitrotoluene (TNT)                    | P                     | Yttrium                                       | P3                    |
| Sodium azide   | P3                    | Tetrachloro-naphthalene                 | A-P3                  | Tri-o-tolyl phosphate                          | A-P3                  | <b>Z</b>                                      |                       |
| Sodium bisulfite                                       | E-P3                  | Tetrahydrofuran                         | A                     | Triphenylamine                                 | A-P3                  | Zinc chloride, fume                           | P3                    |
| Sodium fluoroacetate                                   | P3                    | Tetramethyl lead (as Pb)                | A-P3                  | Triphenyl phosphate                            | A-P3                  | Zinc chromates (inc. zinc potassium chromate) | P3                    |
| Sodium hydroxide                                       | P3                    | Tetramethyl succinonitrile              | A-P3                  | Tungsten & compounds                           | P3                    | Zinc oxide fume                               | P3                    |
| Sodium metabisulfite                                   | P3                    | Tetranitromethane                       | B                     | Turpentine                                     | A                     | Zirconium compounds (as Zr)                   | P3                    |
| Soman (GD)   | B-P3                  | Tetrasodium pyrophosphate               | P3                    | <b>U</b>                                       |                       |   |                       |
| Stibine  | Use<br>air-line       |   |                       | Uranium compounds, natural, soluble (as U)     | P3                    |   |                       |
| Stoddard solvent                                       | A                     |   |                       | Urethane (INN)                                 | A-P3                  |   |                       |
| Strychnine   | P3                    |   |                       |  |                       |   |                       |

## Restrictions on use:

- Standard filtering respirators do not protect against certain gases, e.g. CO (carbon monoxide), CO<sub>2</sub> (carbon dioxide) or N<sub>2</sub> (nitrogen).
- The storage time (month and year) for a filter is marked on the filter label. The above-mentioned storage times for Pro2000 filters are for a factory sealed filter package. Filters are sealed in plastic or foil bags by the manufacturer. Manufacture recommends storage at -10 ... +50 °C temperature and relative humidity below 75 %.
- After use, an opened filter must be wrapped closely, if it is likely to be reused, and it must be replaced not later than within 6 months.
- If the user can identify the breakthrough of the gas by smell, taste or irritation factor the filter must be replaced.
- When a hazardous gas has an olfactory threshold higher than the occupational exposure limit it produces no clear breakthrough sign. In these cases special directions regarding the calculated lifetime are required.
- The filter must be changed if the breathing resistance has increased noticeably.
- Maximum permitted time for use of the mercury filter Hg-P3 (applies also to filters A2B2E2K2Hg-P3, A1E1Hg-P3, Reactor Hg-P3) is 50 hours (EN 14387:2004).
- AX-filter is for single use only, and should be replaced after each shift (prEN529:2003).
- Against radioactive substances and microorganisms a particle filter is recommended for single use only.

SEE FOR MORE DETAILED INFORMATION ON  
FILTER CHOICE, USE, STORING, MAINTENANCE  
AND DISPOSAL SCOTT INSTRUCTIONS FOR USE.

## Accessories

|        |  |
|--------|--|
| 052691 | Prefilter Pro2000 (set of 20)                                    |
| 052692 | Prefilter holder Pro2000 (2 pcs + prefilters (6 pcs)             |
| 052690 | Spark protector Pro2000 (incl. 2 holders + 2 metal spark covers) |
| 052693 | Plastic cover Pro2000 (2 pcs)                                    |
| 052694 | Screw cork 40 mm   |

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SFS-EN ISO 9001:2000  
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