

PRO2000 FILTERS

FOR RESPIRATORY PROTECTIVE EQUIPMENT



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 breathing 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

• PARTICLE FILTERS

- Scott particle filters use only microfibre 'paper' media and do not use any electrostatic filtering method. They are marked 'R' for "reusable" (EN 143/A1:2006)
- PF10 P3 features a high capacity filter element; it removes even the smallest particles with efficiency better than 99,99 %
- The filter element is extremely water-repellent (hydrophobic)

• GAS FILTERS

- Use the highest grade active carbon materials, additionally treated for best performance
- 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

• COMBINED FILTERS

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

HOW TO SELECT A FILTER

- Will the atmosphere contain sufficient oxygen throughout the period of exposure?
- Which hazardous substances are likely to be present? What are their physical and chemical properties?
- Which forms do the airborne contaminants take - dust, fibre, mist, fume, microorganism, gas, vapour, radioactive particulates or gases?
- What health effects can these substances have on the body? 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?
- What are the relevant occupational exposure limit values or the safe exposure levels?

A filtering device should have the correct type of filter matched to the substance(s) from which the wearer needs protection. The maximum mass of filter designated to be connected to a half mask is 300g and to a full face mask 500g. Filters are colour coded, marked with type and class, as well as labelled with the shelf life as factory sealed. The filter label includes the "CE" mark and EN standard number(s), and markings relevant to particular types; if for a powered respirator, the device class.

PARTICULATE CONTAMINANTS



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 and potentially other partly incinerated materials. It can include both liquid droplets and solid particles.

MISTS are airborne droplets which are created when a fluid disperses in air in the form of small particles.

MICRO-ORGANISMS, e.g. bacteria and viruses.

RADIOACTIVE PARTICLES are generated from radioactive material.

Particle filter classification and efficiency EN 143				
Class	Efficiency	Max permitted penetration		Protection factor 1)
		NaCl (solid, dusts)	Paraffin oil (liquid, aerosols)	
P1	Low efficiency (against coarse and minor solid particles)	20 %	20 %	With a half mask 4. With a full face mask 4.
P2	Medium efficiency (against solid and liquid hazardous particles)	6 %	6 %	With a half mask 10. With a full face mask 10.
P3	High efficiency (against solid and liquid toxic particles, and radioactive particles and microorganisms)	0.05 %	0.05 %	With a half mask 20. With a full face mask 40.

1) BS 4275

PARTICLE FILTER OPERATION LIFE

- The filter does not wear out but gets clogged with particles and/or 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.
- 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. Shelf life for Scott particle filters is 10 years.

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

Physiological effects of particulates on the human body

Inert dusts	Minor effects of concentration: e.g. <5 mg/m ³ slight irritation, > 30 mg/m ³ high irritation.
Mineral dusts, e.g. silica dust, quartz	Detrimental, hazardous effects; changes in lung tissues, cancer
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 diseases, e.g. farmer's lung.

How far the particles break through depends on the particle size - the smaller the size the more detrimental they are

Particle size	Respiratory tract
> 10 µm	Trachea
> 5 ... 10 µm	Bronchial tube
< 5 µm	Lungs, pleura
< 1 µm	Alveoli
< 0.1 µm	Bloodstream

1 Qm = 0.001 mm



THE SERVICE LIFE OF A GAS 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

Gases and vapours have various effects on health:

- They can irritate the membranes of respiratory organs, the eyes and skin
- They can reach the lungs and cause damage there
- 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

Effects of gaseous substances depend on:

- The characteristics of the gas or vapour; e.g. toxicity
- The concentration of the contaminant in the air
- Duration of exposure to the contaminant
- The chemical compound or mixture of substances making up 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, blood circulation and sensitivity

GASEOUS CONTAMINANTS

GAS FILTER CLASSIFICATION

Capacity

Class	Capacity	Max concentration of the test gas. EN 14387.	Max concentration of the test gas. EN 12941 and 12942.
		Negative pressure respirators	Powered and power assisted respirators
1	Low capacity	1.000 ppm (0.1 %)	500 ppm (0.05 %)
2	Medium capacity	5.000 ppm (0.5 %)	1.000 ppm (0.1 %)
3	High capacity	10.000 ppm (1 %)*	5.000 ppm (0.5 %)

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

Gas Filter Capacity EN 14387

Filter type	Test gas	Minimum allowed breakthrough time for the test gas. Class / test gas concentration		
		1. Class	2. Class	3. Class
A	Cyclohexane C ₆ H ₁₂	70 min	35 min	65 min
	Chlorine Cl ₂	20 min	20 min	30 min
B	Hydrogen sulphide H ₂ S	40 min	40 min	60 min
	Hydrogen cyanide HCN	25 min	25 min	35 min
E	Sulphur dioxide SO ₂	20 min	20 min	30 min
K	Ammonia NH ₃	50 min	40 min	60 min

Special Filters

Filter type	Test gas	Minimum allowed breakthrough time	Test gas concentration
AX	Dimethyl ether CH ₃ OCH ₃	50 min	0.05 vol.-%
	Isobutane C ₄ H ₁₀	50 min	0.25 vol.-%
	Hg-P3	Mercury, vapour Hg	100 hours

Gas filter capacity with powered air respirators EN 12941 & EN 12942

Filter type	Test gas	Minimum allowed breakthrough time for the test gas. Class / test gas concentration		
		1. Class	2. Class	3. Class
A	Cyclohexane C ₆ H ₁₂	70 min	70 min	35 min
	Chlorine Cl ₂	20 min	20 min	30 min
B	Hydrogen sulphide H ₂ S	40 min	40 min	40 min
	Hydrogen cyanide HCN	25 min	25 min	35 min
E	Sulphur dioxide SO ₂	20 min	20 min	20 min
K	Ammonia NH ₃	50 min	50min	40min

COMBINED FILTERS

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



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Pro2000 Filters					
Colour Code	Code	Filter Type	Application	Weight	Storage Time, years
Particle Filter					
	5052670	PF10 P3 PSL R	Solid and liquid particles of toxic agents, radioactive substances and microorganisms, e.g. bacteria and viruses.	96	10
	5052680	PFR10 P3 R	Solid and liquid particles of toxic agents, radioactive substances and microorganisms, e.g. bacteria and viruses.	96	10
Gas Filter					
	5042870	GF 22 A2	Organic gases and vapours, e.g. solvents with a boiling point above 65°C.	195	5
	5042871	GF 22 B2	Inorganic gases and vapours, e.g. chlorine, hydrogen sulphide and hydrogen cyanide.	198	5
	5542972	GF 32 E2	Acid gases and vapours e.g. sulphur dioxide.	306	5
	5042873	GF 22 K2	Ammonia and organic ammonia derivatives.	257	5
	5542874	GF 22 A2B2	Organic and inorganic gases and vapours.	198	5
	5042979	GF 32 A2B2E2K2	Organic, inorganic and acid gases and vapours as well as ammonia.	322	5
	5042970	GF 32 AX	Gases and vapours from organic compounds with a boiling point below 65°C.	268	5
Combined Filter					
	5042670	CF22 A2-P3	Organic gases and vapours, e.g. solvents with a boiling point above 65°C, solid and liquid particles, radioactive and toxic particles and micro-organisms.	241	5
	5543070	PSL R CF32 A2-P3 R		342	
	5042671	CF22 B2-P3 PSL R	Inorganic gases and vapours, e.g. chlorine, hydrogen sulphide, hydrogen cyanide, fluorine, cyanogen chloride, phosgene and solid and liquid particles, radioactive and toxic particles and micro-organisms.	268	5
	5043072	CF 32 E2-P3 R	Acid gases and vapours e.g. sulphur dioxide, hydrogen fluoride, formic acid, nitric dioxide, solid and liquid particles, radioactive and toxic particles and micro-organisms.	385	5
	5042673	CF 22 K2-P3 R	Ammonia and organic ammonia derivatives, solid and liquid particles, radioactive and toxic particles and micro-organisms.	312	5
	5542674	CF22 A2B2-P3/ PSL R	Organic and inorganic gases and vapours, solid and liquid particles, radioactive and toxic particles and micro-organisms	268	5
	5042678	CF22 A2B2E1-P3/ PSL R	Organic, inorganic and acid gases and vapours, solid and liquid particles, radioactive and toxic particles and plus micro-organisms.	268	5
	5042778	CF22 A1E1Hg-P3 PSL R	Organic and acid gases and vapours, mercury compounds, solid and liquid hazardous particles, e.g. radioactive and toxic substances and micro-organisms.	270	5
	5042799	CF32	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.	387	5 *)
	5543699	A2B2E2K2-P3 PSL R CFR32 A2B2E2K2-P3R		387	5
	5042770	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.	350	5
	5542777	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.	331	5
	5043679	CFR32 Reactor-Hg-P3 R		331	5
	5542798	CF 32 AB2E2K2Hg-P3	Organic, inorganic and acid gases and vapours as well as ammonia and organic ammonia derivatives, mercury and mercury compounds, solid and liquid particles, radioactive and toxic particles and micro-organisms.	371	5

Key: R = Reusable for the particle filter element
PFR and CFR = Reduced opening
PSL = Approved with selected Scott powered air respirators

*) In aluminium foil package 10 y.



PARTICLE FILTERS



PF10 P3

GAS FILTERS



GF22 A2



GF22 B2



GF32 E2



GF22 K2



GF22 A2B2



GF32 A2B2E2K2



GF32 AX

COMBINED FILTERS



CF22 A2-P3



CF22 B2-P3



CF32 E2-P3



CF22 K2-P3



CF22 A2B2-P3



CF22 A2B2E1-P3



CF32 A2B2E2K2 P3



CFR32 A2B2E2K2 P3



CF32 AX-P3



CF 32 REACTOR-HG-P3



CF 22 A1E1HG-P3



CF 32 A2B2E2K2-HG-P3



Pro2000 Filters

Used in conjunction with the Scott Safety Respiratory range, Pro2000 Filters offer a high performance solution to a wide range of respiratory hazards. Pro2000 filters can be utilised with both negative pressure and powered air respirators.

ORDERING INFORMATION

PRO2000 FILTERS - ACCESSORIES

Accessories for Pro2000 filters	
Part Number	Description
5052691	Prefilter discs Pro2000 (set of 20)
5052692	Prefilter and holder Pro2000 (incl. 2 holders + 6 prefilters)
5052690	Spark arrester Pro2000 (incl. 2 holders + 2 aluminium spark arresters)
5052693	Seal cover Pro2000 LD polyethylene (2 covers)
5052694	Shower cover Pro2000, EPDM

RESTRICTIONS ON USE
Standard filtering respirators do not protect against certain gases, e.g. CO ₂ (carbon dioxide)
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. Manufacturer 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 identifies 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).
AX-filter is for single use only, and should be replaced after each shift (EN14387).
Against radioactive substances and microorganisms a particle filter is recommended for single use only.

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

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