respiratory filters

AVEC

RESPIRATORY FILTERS

PROTECTIVE EQUIPMENT

COLLECTIVE FILTERS
FOR SHELTERS AND VEHICLES

SEALING PRODUCTION,
WATER JET MATERIAL CUTTING

PC AND DSC LABORATORY TESTS

AVEC CHEM, **specializes in the development and production of respiratory protective devices and air and water-treatment equipment**

Products include:

- Respiratory filters
- Protective equipment
- Filters for shelters
- Filters for mobile devices
- Special air and water-treatment equipment

AVEC products provide protection for employees in a number of industrial areas and members of armed forces and integrated rescue systems.

Long-term experience in the development of protective devices and the use of state-of-the-art materials and technological production processes guarantee excellent technical parameters in all products. The company has introduced the Quality Management Systems **ISO 9001:2000, ISO 14001:2004** and AQUAP in order to ensure quality and a high engineering level. Filters are certified by the Occupational Safety Research Institute (Authorised body 235) and have a certificate of conformity with CE European Standards. The NBC filters are tested by the TNO and NELSON Laboratories international testing facilities.

The company is a member of the Association of the defence industry of the Czech Republic and the Czech Health & Safety Alliance.

CZECH
HEALTH & SAFETY
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ASSOCIATION OF THE DEFENCE INDUSTRY OF THE CZECH REPUBLIC

Protective filters in combination with a full-face mask, half-face mask, respirator or powered filtering device provide reliable protection of air passages against a wide range of harmful and highly toxic substances. Filters are produced in full assortment with standard round threads according to EN 148-1 (Rd 40x1/7") or GOST 8762-75 (OZ 40x4 mm).

Filter components are made of hard plastic and filters are filled with activated carbon with a suitable impregnation which ensures the capture of chemical and highly toxic substances. Activated carbon is distinguished by an extremely large adsorption area of up to 130,000 m^2 per 100 grams.
The impregnation of activated carbon is based on long-term experience and requirements with regard to the filter type, the guarantee of long-term storage and reliable protection against substances for which a particular filter is used.
Particle, combined, special and NBC filters are equipped with a special hydrophobic P3 class filter element which has been classified as P3D (D - dust) based on dust absorption capacity tests. AVEC filters rank among top products in the category of protective devices with regard to weight, dimensions, and high efficiency.
Thanks to their light weight, dimensions, high efficiency, low breathing resistance and reliability, AVEC filters have become very popular with both domestic and foreign users.

The filter element is made of micro-fibre filter paper. The fibre density works like a very fine mesh which reliably captures the finest particles including aerosols, smoke, micro-organisms and highly-toxic particles.

Gas, Combined and Special Filters
These types of filters most often use the principles of filteration, physical adsorption and chemisorption.

Filteration is a process in which solid particles and aerosols are separated from the carrier gas – air passing through the fine structure of filter material.

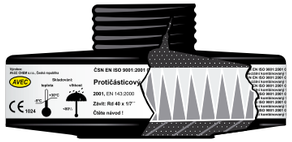
Physical Adsorption is a phenomenon in which the captured substance condensates inside the micro-porous structure of activated carbon. Molecules of the passing gas are captured in the structure of the absorption element of activated carbon.

Chemisorption is a process in which an appropriate substance or a group of substances are, using a suitable technological methours, applied to the micro-porous structure of activated carbon, which enables interactions between the captured substance and the impregnant. During a process of this type molecules of the captured harmful substance mostly condense and, consequently, react with the impregnant. Cryogenic gases such as rare gases, nitrogen and oxygen are not practically involved in such processes and, thus, having been freed of the harmful substances, easily pass through the filter absorption bed.

Filters for protective devices are divided into five categories:
❶ Particle
❷ Gas
❸ Combined
❹ Special
❺ NBC (Nuclear Biological Chemical)

Basic Categories of AVEC Filters

❶Particle filters:

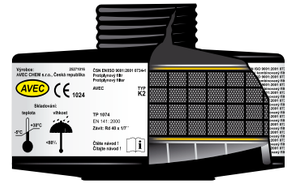


Particle filters and filter elements are made of pleated micro-fibre Class 16 filter paper. High-quality material, state-of-the-art processing technology (Soft-Touch) and fixation enable the production of highly efficient particle filters with a very low breathing resistance. The pleated particle element fitted in the filter has an ideal capture area, low breathing resistance, and very efficiently captures a wide range of particles such as dust, aerosols, fumes, radioactive fallout, dangerous micro-organisms (bacteria, viruses, spores), etc. The filter efficiency of P3 filters is up to 99.999999%.
Combined and special filters P3D are tested against dolomite dust clogging.

To ensure the maximum reliability of all products, each particle filter and its filter element are tested during production on special Bench Rig equipment using flame photo-spectrometry. Environmentally friendly NaCl is used as the testing medium. Praffine oil test is used to verify aerosol capture quality parameters

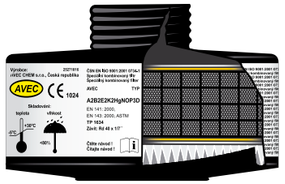
❷Gas Filters:

Gas filters protect users against the harmful effects of gaseous chemical substances. The filters are filled with impregnated activated carbon. Such gas filters are effective against chemical substances and a group of substances with similar chemical properties. Thanks to the impregnation of the carrier (activated carbon), the gas filters are capable of capturing a wide range of chemical substances with various chemical properties.



❸Combined Filters:

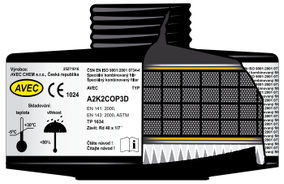
Combined filters are gas filters fitted with a particle filter element and an appropriate bed of activated carbon or impregnated activated carbon. These filters therefore posse the qualities of both gas and particle filters. All types and classes of Combined filters satisfy the requirements and production technical specifications for both gas and particle filters.



Exaple of the combined filter designation:
A2B2E2K2P3D or shortened designation ABEK2P3D (if class of each gas filter is the same)

❹Special Filters

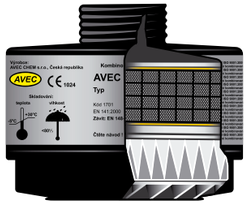
Combined and gas filters usually do not provide protection against the effects of certain chemical substances with specific qualities such as organic substances with a boiling point below 65 °C, mercury, NOx, CO, radioactive methyl iodide, etc. Special filters are produced to reliably capture such substances. Procedures and restrictions specified in the instructions for use must be observed when using such filters.



❺ NBC Filters

The highest level of upper respiratory protection requires safeguarding against CBRN agents. NBC filters provide protection against the effects of chemical substances and weapons of mass destruction in which extremely toxic substances with paralyzing and lethal effects on living organisms are used. The filters are filled with appropriate watherlit which is distinguished by an increased effectiveness in capturing substances with specific effects on living organisms. NBC filters are fitted with a highly effective P3D class filter element. The filter element is also more effective against non-polar liquid aerosols. AVEC NBC filters are usually fitted with a preliminary filter element before the filter element P3D for capturing dust particles. NBC filters provide reliable protection against biological warfare substances (bacteria, viruses, spores, etc.), poisonous warfare gases, harmful industrial pollutants, radioactive fallout, etc.

NBC filters are used by the army, police, rescue squads, civil defence, the chemical industry, health resorts, etc.
Thanks to the materials used and the design of these products, the filters are suitable for long-term storage.



Absorption capacities of gas filters A, B, E, K, special filters AX, NO and Hg

The Breakthrough time is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use.

Type and class	Test gas	Breakthrough time under normal testing conditions in minutes	Concentration of test gas in air		Penetration concentration
			obj. v %	mg/l	ml/m³
A1	Cyclohexane	70	0,1	3,5	10
B1	Chlorine	20	0,1	3,0	0,5
	Hydrogen sulfide	40	0,1	1,4	10
	Hydrogen cyanide	25	0,1	1,1	10
E1	Sulphur dioxide	20	0,1	2,7	5
K1	Ammonia	50	0,1	0,7	25
A2	Cyclohexane	35	0,5	17,5	10
B2	Chlorine	20	0,5	15,0	0,5
	Hydrogen sulfide	40	0,5	7,1	10
	Hydrogen cyanide	25	0,5	5,6	10
E2	Sulphur dioxide	20	0,5	13,3	5
K2	Ammonia	40	0,5	3,5	25
AX	Dimethyl ether	50	0,05	0,95	5
	Isobutanee	50	0,25	6	5
NO-P3D	Nitrogen monoxide	20	0,25	3,1	5
	Nitrogen dioxide	20	0,25	4,8	5
Hg-P3D	Mercury vapours	100 hoursin	1,6	13,0	0,1

Use of Filters

The lifetime of filters depends on the conditions of use and is subject to the following factors:

- **User's air consumption (air flow)**
- **Concentration and range of harmful substances in ambient atmosphere**
- **Quantity of gross dust and aerosol particles**
- **Relative air humidity**
- **Ambient temperature**

The quality parameters of the filters are tested for specified types of testing substances under testing conditions prescribed by European standards (ES) and engineering conditions for production and supplies. The filter resistance period for industrial use is measured under normal conditions at 50, 95 and 70% relative humidity and an air flow of 30 l per minute for:
Class 1 – harmful substance concentration up to 1,000 ppm (0.1% of volume);
Class 2 – harmful substance concentration up to 5,000 ppm (0.5% of volume);
The filter resistance period is determined according to the applicable European standards. NBC filters and special industrial filters are, in terms of quality, tested under specific conditions for types of substances according to the manufacturer's technical specifications and customer's requirements.

The filters' Dynamic Absorption Capacity (DSC), which is usually stated in grams, is calculated based on the specified resistance period and actual concentration. The DSC for individual types of filters is specified in the tables.

The approximate filter resistance period may be, under normal conditions, calculated using the following formula:

T= DSC*1000/(P*C)

T – Approximate useful lifetime in minutes;
DSC – Filter's Dynamic Sorption Capacity in grams;
P – Airflow (air consumption) in l/min
C – Harmful substance concentration in mg/l

Useful life of particle filter:

The resistance period of a particle filter depends on the quantity of particles in the ambient atmosphere, their size, flow rate and air humidity. A particle filter needs to be replaced in the event that breathing resistance increases as a result of filter clogging by captured particles.

Respiratory filter use restrictions:

- When used, the oxygen concentration in ambient atmosphere must not drop below 17% of volume;
- The expected concentration of harmful substances in the air, with regard to the period of maximum possible use, should be 1,000 ppm (0.1% of volume) for a Class 1 filter; 5,000 ppm (0.5% of volume) for a Class 2 filter; 10,000 ppm (1% of volume) for a Class 3 filter
- The filter may be used within the temperature range from -30°C to +70°C. Filters A2 and AX are recommended for use within the temperature range of -30°C to 30°C, depending on the type of substance
- If the filter is used against radioactive substances, mercury and highly toxic substances, low-boiling organic substances, tear-producing and irritating substances, dangerous micro-organisms, NOx and carbon monoxide, the filter is always only single-use!
- Always use filters of the same type, class and air resistance in a powered filtering unit and always replace all filters at the same time
- Always use a filter with the P3 or P3D filter element against solid and liquid particles, micro-organisms, viruses, smoke etc.
- The maximum useful life of the filter against mercury vapours is legislatively defined by European Standards as 50 hours
- Filters cannot be regenerated; therefore, do not clean with pressurized air or water!

designation

Filter Type	Effective against
A	organic gases and vapours of organic substances with a boiling point above 65 °C (cyclohexane, toluene, xylene, ...)
AX	organic gases and fuses of organic substances with a boiling point below 65 °C (acetone, diethyl ether, ...)
B	inorganic gases and vapours
E	sulphur dioxide and other acid gases and vapours
K	ammonia and organic amines
SX	against specific named gases and vapours as specified by the manufacturer

Combined and Special Filters

Filters equipped with the P3D hydrophobic element against solid and liquid particles are tested for dust clogging (D-dust).

Special Filters

Filter Type	Effective against
NO	nitrogen oxides, e.g NO, NO_2, NO_x
Hg	mercury vapours and aerosols
CO	carbon monoxide
Reactor	radioactive iodomethane 129, 131

Colour coding of filters (EN 14387)

Type	Class	Colour Code
A	1, 2 nebo 3	brown
B	1, 2 nebo 3	grey
E	1, 2 nebo 3	yellow
K	1, 2 nebo 3	green
P	1, 2 nebo 3	white

Type	Colour Code
NO-P3D	blue-white
Hg-P3D	red-white
Reactor-P3D	orange-white
CO-P3D	black-white
SX-P3D	violet-white

Gas filters A, B, E and K are classified as: 1, 2, 3; based on their absorption capacity

Filter Class	Absorption capacity
1	concentration of harmful substances ≤ 0.1 of volume %
2	concentration of harmful substances ≤ 0.5 of volume %
3	concentration of harmful substances ≤ 1.0 of volume %

Filter Designation

Example:

Gas filter EN 14387	**A2AX**
Combined filter EN 14387	**A2B2E2K2NOP3D**
Special Combined filter EN 14387	**A2B2E2K2HgNOP3D**

Note: If all classes of filters against multiple gases are identical, an abbreviated designation (ABEK2P3D) may be used.

Solid particle Filters

Filter Class	Absorption Capacity
P1	solid particles (dust)
P2	aerosols
P3	solid and liquid aerosles, e.g. smoke, bacteria, viruses, etc.
D (dust)	satisfies dust clogging test (EN 14387)

Particle penetration through filter (EN 143:2000)

Filter Class	Maximum penetration of testing aerosol (%)	
	Sodium chloride *)	Paraffine oil *)
P1	20	20
P2	6	6
P3	0,05	0,05

*) at 95 l/min

according to type

1. Particle and aerosol filter of P3 class				exp. 20 years
Filter type and class	Colour code	Order number		Filter use
		Rd 40x1/7"	OZ 40x4	
P3		1001	2001	Against solid particles, aerosols, enzymes, bacteria, and viruses

2. Gas filters A, AX, B, E, K				exp. 5 years
Filter type and class	Colour code	Order number		Filter use
		Rd 40x1/7"	OZ 40x4	
A2AX		1021	2021	Against organic gases and vapours of low-boiling organic substances with a boiling point below and above 65 °C, diethyl ether, acetone, toluene, xylenes
B2		1072	2072	Against inorganic gases and vapours
E2		1073	2073	Against sulphur dioxide, trioxide, acetic acid and similar acid gases and vapours
K2		1074	2074	Against ammonia and organic amines

3. Combined and special filters				exp. 5 years
Filter type and class	Colour code	Order number		Filter use
		Rd 40x1/7"	OZ 40x4	
A2AXP3		1521	2521	Against organic gases and vapours of low-boiling organic substances with a boiling point below and above 65 °C (diethyl ether, acetone, toluene, xylenes), solid particles, aerosols, enzymes, bacteria and viruses
B2P3D		1272	2272	Against inorganic gases and vapours, solid particles, aerosols, enzymes, bacteria and viruses
K2P3D		1274	2274	Against ammonia, amines, solid particles, aerosols, enzymes, bacteria and viruses
A2B2P3D		1275	2275	Against organic gases and vapours of organic substances with a boiling point above 65 °C, inorganic gases and vapours, solid particles, aerosols, enzymes, bacteria and viruses
A2B2E2P3D		1276	2276	Against organic gases and vapours of organic substances with a boiling point above 65 °C, inorganic gases and vapours, sulphur dioxide, trioxide, acetic acid, and similar acid gases and vapours, solid particles, aerosols, enzymes, bacteria and viruses

according to type

3. Combined and special filters				exp. 5 years
Filter type and class	Colour code	Order number		Filter use
		Rd 40x1/7”	OZ 40x4	
A2B2E2K2P3D		1277	2277	Against organic gases and vapours of organic substances with a boiling point above 65 °C, inorganic and organic acid gases and vapours, sulphur dioxide, trioxide, acetic acid and similar acid gases and vapours, ammonia, amines, solid particles, aerosols, enzymes, bacteria and viruses
A2B1E1K1P3D		1385	2385	Against solid and liquid aerosols, smoke-producing substances, radioactive particles, bacteria, viruses, vapours of organic or inorganic acids, hydroxides, organic solvents with a boiling point above 65 °C, ammonia, amines, acid gases, agricultural chemical combustion gases, tear-producing, irritant and other toxic substances, e.g. benzene, toluene, vinyl chloride, fluorine, hydrogen fluoride, sulphur oxides, phosgene, bromoacetone, CS substance, phosphoric acid and its organic derivatives, chloracetic acid, aldehydes, mixtures of inorganic acids and organic substances
A2B2E2K2NOP3D		1631	2631	Against solid and liquid aerosols, smoke-producing agents, radioactive fallout, bacteria, viruses, fumes of organic or inorganic acids, hydroxides, organic solvents with a boiling point above 65 °C, ammonia, amines, acid gases, agricultural chemical combustion gases, tear-producing, irritant and other toxic substances, e.g. benzene, toluene, vinyl chloride, fluorine, hydrogen fluoride, sulphur oxides, phosgene, bromoacetone, CS substance, phosphoric acid and its organic derivatives, chloracetic acid, aldehydes, mixtures of inorganic acids and organic substances
A2B2E2K2HgNOP3D		1632	2632	Against solid and liquid aerosols, smoke-producing agents, radioactive fallout, bacteria, viruses, fumes of organic or inorganic acids, hydroxides, organic solvents with the boiling point above 65 °C, ammonia, amines, acid gases, agricultural chemical combustion gases, tear, irritant and other toxic substances, e.g. benzene, toluene, vinyl chloride, fluorine, hydrogen fluoride, sulphur oxides, phosgene, bromoacetone, CS substance, phosphoric acid and its organic derivatives, chloracetic acid, aldehydes, mixtures of inorganic acids and organic substances and mercury vapours.
A2K2COP3D		1638	2638	Against organic gases and vapours of organic substances with a boiling point above 65 °C, inorganic and organic acid gases and vapours, ammonia, amines, carbon monoxide, solid particles, aerosols, enzymes, bacteria and viruses
ReactorP3D		1634	2634	Against radioactive iodine, iodine organic compounds (Iodomethane,129, 131), solid particles, aerosols, enzymes, bacteria and viruses

according to type

3. Combined and special filters				exp. 5 years
Filter type and class	Colour code	Order number		Filter use
		Rd 40x1/7”	OZ 40x4	
Hg-ReactorP3D		1634	2634	Against mercury vapours, radioaktive iodine, organic iodine compounds (iodomethane,129, 131), solid particles, aerosols, enzymes, bacteria and viruses

4. NBC (CBRN) filters				
Filter	Colour code	Order number		Filter use
		Rd 40x1/7”	OZ 40x4	
NBC–1/S type A2B1E1K1P3D		1701	2701	Against solid and liquid aerosols, smoke-producing agents, radioactive particles, bacteria, viruses, vapours of organic and inorganic acids, hydrate oxides, organic solvents with a boiling point above 65 °C, ammonia, amines, acid gases, agricultural chemical combustion gases, tear-producing, irritant and other toxic agents, e.g. benzene, toluene, vinyl chloride, fluorine, hydrogen fluoride, sulphur oxides, phosgene, bromoacetone, CS substance, phosphoric acid and its organic derivatives, chloracetic acid, aldehydes, mixtures of inorganic acids and organic substances
NBC–2/SL type A2B2E2K2NOP3D		1703	2703	Against solid and liquid aerosols, smoke-producing agents, radioactive fallout, bacteria, viruses, vapours of organic and inorganic acids, hydrate oxides, organic solvents with a boiling point above 65 °C, ammonia, amines, acid gases, agricultural chemical combustion gases, tear-producing, irritant and other toxic agents, e.g. benzene, toluene, vinyl chloride, fluorine, hydrogen fluoride, sulphur oxides, phosgene, bromoacetone, CS substance, phosphoric acid and its organic derivatives, chloracetic acid, aldehydes, mixtures of inorganic acids and organic substances
NBC–3/SL type A2B2E2K2HgNOP3D		1704	2704	Against solid and liquid aerosols, smoke-producing agents, radioactive fallout, bacteria, viruses, vapours of organic and inorganic acids, hydrate oxides, organic solvents with a boiling point above 65 °C, ammonia, amines, acid gases, agricultural chemical combustion gases, tear-producing, irritant and other toxic agents, e.g. benzene, toluene, vinyl chloride, fluorine, hydrogen fluoride, sulphur oxides, phosgene, bromoacetone, CS substance, phosphoric acid and its organic derivatives, chloracetic acid, aldehydes, mixtures of inorganic acids and organic substances

PARTICLE ❶

filter P3D

Order Numbers	1001	thread Rd (40x1/7“)
	2001	thread OZ (40x4 mm)

The filter will reliably protect breathing organs against solid and liquid aerosols, smoke-producing substances, radioactive dust, bacteria and viruses.

Technical Specifications

Diameter	110 mm
Height	55 mm
Weight	110 g ± 5%
Storage life	20 years
Certified according to	EN 143:2000
Certified by Authorised body No. 235	

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1])	Filter AVEC	EN [1])	Filter AVEC
120	<100	420	< 250

Filter Class	particle penetration test	Maximum penetration of test aerosol in %	
		EN [1])	Filter AVEC[1])
P3D	Sodium chloride	0,05	0,0002 - 0,05
	Paraffin oil	0,05	0,02 - 0,05

1) According to EN 143:2000 at the flow rate of 95 l/min

❷ GAS

filter A2AX

Order Numbers	1021	thread Rd (40x1/7“)
	2021	thread OZ (40x4 mm)

A highly efficient filter which provides protection of breathing organs against a wide range of organic solvents and vapours of organic substances with a boiling point below and above 65°C, e.g. diethyl ether, acetone, benzene, toluene, xylene, etc.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	260 g ± 5%
Storage life	5 years
Certified according to	EN 14387
	EN 12941
	EN 12942
Certified by Authorised body No. 235	

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1])	Filter AVEC	EN [1])	Filter AVEC
140	70	560	200

Type and Class	Test Gas		Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min		Penetration concentration	Dynamic Absorption Capacity of the filter in grams	
			EN [1])	Filter AVEC[2])	obj. v %	mg/l	ml/m³	EN [1])	Filter AVEC[2])
A2	Cyclohexane	(C_6H_{12})	35	60	0,5	17,5	10	18,375	31,500
AX	Dimethy ether		50	75	0,05	0,95	5	1,425	2,138
	Isobutane		50	55	0,25	6	5	9,000	9,900
	Diethyl ether [3])		——	80	0,25	7,56	10	——	18,000

1) According to EN 14387, EN 371 **2)** The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use. **3)** The additional test is not regulated by any EN standard. The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not determine the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use.

GAS ❷

filter B2

Order Numbers	1072	thread Rd (40x1/7“)
	2072	thread OZ (40x4 mm)

The filter provides protection of breathing organs against vapours of a wide range of organic and inorganic acids, chlorine gas, fluorine, hydrogen cyanide, phosgene, hydrogen sulphide, etc.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	280 g ± 5%
Storage life	5 years
Certified according to	EN 14387
	EN 12941
	EN 12942

Certified by Authorised body No. 235

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1])	Filter AVEC	EN [1])	Filter AVEC
140	120	560	350

Type and Class	Test Gas		Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min		Penetration concentration	Dynamic Absorption Capacity of the filter in grams	
			EN [1])	Filter AVEC[2])	obj. v %	mg/l	ml/m³	EN [1])	Filter AVEC[2])
B2	Chlorine	(Cl_2)	20	45	0,5	15	0,5	9,000	20,250
	Hydrogen sulfide	(H_2S)	40	>80	0,5	7,1	10	8,520	>17,040
	Hydrogen cyanide	(HCN)	25	50	0,5	5,6	10	4,200	8,400

1) According to EN 14387 **2)** The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use.

❷ GAS

filter E2

Order Numbers	1073	thread Rd (40x1/7“)
	2073	thread OZ (40x4 mm)

The filter provides protection of breathing organs against sulphur dioxide and suplhur trioxide and organic acid gases and vapours, e.g. acetic acid.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	280 g ± 5%
Storage life	5 years
Certified according to	EN 14387
	EN 12941
	EN 12942

Certified by Authorised body No. 235

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1])	Filter AVEC	EN [1])	Filter AVEC
140	120	560	370

Type and Class	Test Gas		Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min		Penetration concentration	Dynamic Absorption Capacity of the filter in grams	
			EN [1])	Filter AVEC[2])	obj. v %	mg/l	ml/m³	EN [1])	Filter AVEC[2])
E2	Sulphur dioxide	(SO_2)	20	25	0,5	13,3	5	7,980	9,975

1) According to EN 14387. **2)** The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use.

GAS ❷

filter K2

Order Numbers	1074	thread Rd (40x1/7“)
	2074	thread OZ (40x4 mm)

The filter provides protection of breathing organs against ammonia and vapours of organic amines.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	280 g ± 5%
Storage life	5 years
Certified according to	EN 14387
	EN 12941
	EN 12942

Certified by Authorised body No. 235

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1])	Filter AVEC	EN [1])	Filter AVEC
140	120	560	400

Type and Class	Test Gas		Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min		Penetration concentration	Dynamic Absorption Capacity of the filter in grams	
			EN [1])	Filter AVEC[2])	obj. v %	mg/l	ml/m³	EN [1])	Filter AVEC[2])
K2	Ammonia	(NH_3)	40	70	0,5	3,5	25	4,200	7,350

1) According to EN 14387 **2)** The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use.

❸ COMBINED

filter A2AXP3

Order Numbers	1521	thread Rd (40x1/7“)
	2521	thread OZ (40x4 mm)

This highly efficient filter provides protection of breathing organs against solid and liquid aerosols, smoke and smoke-producing substances, radioactive dust, spores, bacteria, viruses, a wide range of organic solvents and vapours of organic substances with a boiling point below and above 65 °C, e.g. diethyl ether, acetone, benzene, toluene, xylene, etc.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	280 g ± 5%
Storage life	5 years
Certified according to	EN 14387
	EN 12941
	EN 12942

Certified by Authorised body No. 235

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1])	Filter AVEC	EN [1])	Filter AVEC
260	165	980	480

Filter Class	Particle penetration test	Maximum penetration of test aerosol in %	
		EN [3])	Filter AVEC[4])
P3D	Sodium chloride	0,05	0,0002 - 0,05
	Paraffin oil	0,05	0,02 - 0,05

Type and Class	Test Gas		Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min		Penetration concentration	Dynamic Absorption Capacity of filter in grams	
			EN [1])	Filter AVEC[2])	obj. v %	mg/l	ml/m³	EN [1])	Filter AVEC[2])
A2	Cyclohexane	(C_6H_{12})	35	60	0,5	17,5	10	18,375	31,500
AX	Dimethy ether		50	75	0,05	0,95	5	1,425	2,138
	Isobutane		50	55	0,25	6	5	9,000	9,900
	Diethyl ether [5])		—	80	0,25	7,56	10	—	18,000

1) According to EN 14387, EN 371 **2)** The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use. **3)** According to EN 143:2000 at the flow rate of 95 l/min **4)** At the flow rate of 95 l/min; **5)** The additional test is not regulated by any EN standard. The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use.

COMBINED ❸

filter B2P3D

Order Numbers	1272	thread Rd (40x1/7“)
	2272	thread OZ (40x4 mm)

The filter provides protection of breathing organs against solid and liquid aerosols, smoke and smoke-producing substances, radioactive dust, spores, bacteria, viruses, vapours of a wide range of inorganic and organic acids, chlorine gas, fluorine, hydrogen cyanide, phosgene, hydrogen sulphide, etc.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	310 g ± 5%
Storage life	5 years
Certified according to	EN 14387 EN 12941 EN 12942

Certified by Authorised body No. 235

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1])	Filter AVEC	EN [1])	Filter AVEC
260	170	980	600

Filter Class	Particle penetration test	Maximum penetration of test aerosol in %	
		EN [3])	Filter AVEC[4])
P3D	Sodium chloride	0,05	0,0002 - 0,05
	Paraffin oil	0,05	0,02 - 0,05

Type and Class	Test Gas		Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min		Penetration concentration	Dynamic Absorption Capacity of the filter in grams	
			EN [1])	Filter AVEC[2])	obj. v %	mg/l	ml/m³	EN [1])	Filter AVEC[2])
B2	Chlorine	(Cl_2)	20	45	0,5	15	0,5	9,000	20,250
	Hydrogen sulfide	(H_2S)	40	>60	0,5	7,1	10	8,520	>17,040
	Hydrogen cyanide	(HCN)	25	50	0,5	5,6	10	4,200	8,400

1) According to EN 14387; **2)** The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use.; **3)** According to EN 143:2000 at the flow rate of 95 l/min; **4)** At the flow rate of 95 l/min

❸ COMBINED

filter K2P3D

Order Numbers	1274	thread Rd (40x1/7“)
	2274	thread OZ (40x4 mm)

The filter is used for the protection of breathing organs against solid and liquid aerosols, smoke and smoke-producing substances, radioactive dust, spores, bacteria, viruses, ammonia and vapours of organic amines.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	320 g ± 5%
Storage life	5 years
Certified according to	EN 14387 EN 12941 EN 12942

Certified by Authorised body No. 235

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1])	Filter AVEC	EN [1])	Filter AVEC
260	170	980	600

Filter Class	Particle penetration test	Maximum penetration of test aerosol in %	
		EN [3])	Filter AVEC[4])
P3D	Sodium chloride	0,05	0,0002 - 0,05
	Paraffin oil	0,05	0,02 - 0,05

Type and Class	Test Gas		Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min		Penetration concentration	Dynamic Absorption Capacity of filter in grams	
			EN [1])	Filter AVEC [2])	obj. v %	mg/l	ml/m³	EN [1])	Filter AVEC[2])
K2	Ammonia	(NH_3)	40	50	0,5	3,5	25	4,200	5,250

1) According to EN 14387. **2)** The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use. **3)** According to EN 143:2000 at the flow rate of 95 l/min. **4)** At the flow rate of 95 l/min

filter A2B2P3D

Order Numbers	1275	thread Rd (40x1/7“)
	2275	thread OZ (40x4 mm)

The filter is used for the protection of breathing organs against solid and liquid aerosols, smoke and smoke-producing substances, radioactive dust, spores, bacteria, viruses, ammonia and vapours of organic acids, organic solvents with a boiling point above 65 °C, benzene, toluene, vinyl chloride, fluorine, hydrogen fluoride, hydrogen chloride, chloroacetic acid, mixtures of inorganic acids and acid organic substances.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	310 g ± 5%
Storage life	5 years
Certified according to	EN 14387
	EN 12941
	EN 12942

Certified by Authorised body No. 235

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1]	Filter AVEC	EN [1]	Filter AVEC
260	170	980	600

Filter Class	Particle penetration test	Maximum penetration of test aerosol in %	
		EN [3]	Filter AVEC[4]
P3D	Sodium chloride	0,05	0,0002 - 0,05
	Paraffin oil	0,05	0,02 - 0,05

Type and Class	Test Gas		Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min		Penetration concentration	Dynamic Absorption Capacity of filter in grams	
			EN [1]	Filter AVEC [2]	obj. v %	mg/l	ml/m³	EN [1]	Filter AVEC[2]
A2	Cyclohexane	(C_6H_{12})	35	39	0,5	17,5	10	18,375	20,475
B2	Chlorine	(Cl_2)	20	45	0,5	15	0,5	9,000	20,250
	Hydrogen sulfide	(H_2S)	50	55	0,5	7,1	10	8,520	>17,040
	Hydrogen cyanide	(HCN)	___	80	0,5	75,6	10	4,200	8,400

1) According to EN 14387. **2)** The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use.**3)** According to EN 143:2000 at the flow rate of 95 l/min. **4)** At the flow rate of 95 l/min

filter A2B2E2P3D

Order Numbers	1276	thread Rd (40x1/7“)
	2276	thread OZ (40x4 mm)

The filter is used for the protection of breathing organs against solid and liquid aerosols, smoke and smoke-producing substances, bacteria, viruses, vapours of organic and inorganic acids, hydroxides, organic solvents with a boiling point above 65 °C, acid gases, agricultural chemical combustion products, irritant and other toxic substances, e.g. benzene, toluene, vinyl chloride, fluorine, hydrogen fluoride, hydrogen chloride, sulphur oxides, hydrogen sulphide, phosgene, chloroacetic acid, mixtures of inorganic acids and organic substances.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	310 g ± 5%
Storage life	5 years
Certified according to	EN 14387
	EN 12941
	EN 12942

Certified by Authorised body No. 235

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1]	Filter AVEC	EN [1]	Filter AVEC
260	170	980	600

Filter Class	Particle penetration test	Maximum penetration of test aerosol in %	
		EN [3]	Filter AVEC[4]
P3D	Sodium chloride	0,05	0,0002 - 0,05
	Paraffin oil	0,05	0,02 - 0,05

Type and Class	Test Gas		Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min		Penetration concentration	Dynamic Absorption Capacity of filter in grams	
			EN [1]	Filter AVEC[2])	obj. v %	mg/l	ml/m³	EN [1]	Filter AVEC[2])
A2	Cyclohexane	(C_6H_{12})	35	39	0,5	17,5	10	18,375	20,475
B2	Chlorine	(Cl_2)	20	45	0,5	15	0,5	9,000	20,250
	Hydrogen sulfide	(H_2S)	40	>80	0,5	7,1	10	8,520	>17,040
	Hydrogen cyanide	(SO_2)	25	50	0,5	5,6	10	4,200	8,400
E2	Sulphur dioxide	(SO_2)	20	25	0,5	13,3	5	7,980	9,975

1) According to EN 14387 **2)** The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use **3)** According to EN 143:2000 at the flow rate of 95 l/min. **4)** At the flow rate of 95 l/min

filter A2B2E2K2P3D

Order Numbers	1277	thread Rd (40x1/7“)
	2277	thread OZ (40x4 mm)

The filter is used for the protection of breathing organs against solid and liquid aerosols, smoke and smoke-producing substances, radioactive dust, bacteria, viruses, vapours of organic and inorganic acids, hydroxides, organic solvents with a boiling point above 65°C, industrial harmful pollutants, e.g. ammonia, amines, acid gases, benzene, toluene, vinyl chloride, fluorine, hydrogen flouride, hydrogen chloride, sulphur oxides, phosgene, chloroacetic acid, aldehydes, mixtures of inorganic acids and other substances, according to the directions for use.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	310 g ± 5%
Storage life	5 years
Certified according to	EN 14387
	EN 12941
	EN 12942

Certified by Authorised body No. 235

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1]	Filter AVEC	EN [1]	Filter AVEC
260	170	980	600

Filter Class	Particle penetration test	Maximum penetration of test aerosol in %	
		EN [3]	Filter AVEC[4]
P3D	Sodium chloride	0,05	0,0002 - 0,05
	Paraffin oil	0,05	0,02 - 0,05

Type and Class	Test Gas		Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min		Penetration concentration	Dynamic Absorption Capacity of filter in grams	
			EN [1]	Filter AVEC[2]	obj. v %	mg/l	ml/m³	EN [1]	Filter AVEC[2]
A2	Cyclohexane	(C_6H_{12})	35	39	0,5	17,5	10	18,375	20,475
B2	Chlorine	(Cl_2)	20	45	0,5	15	0,5	9,000	20,250
	Hydrogen sulfide	(H_2S)	40	>80	0,5	7,1	10	8,520	>17,040
	Hydrogen cyanide	(HCN)	25	50	0,5	5,6	10	4,200	8,400
E2	Sulphur dioxide	(SO_2)	20	25	0,5	13,3	5	7,980	9,975
K2	Ammonia	(NH_3)	40	50	0,5	3,5	25	4,200	5,250

1) According to EN 14387. **2)** The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use. **3)** According to EN 143:2000 at the flow rate of 95 l/min. **4)** At the flow rate of 95 l/min

filter A2B1E1K1P3D

Order Numbers	1385	thread Rd (40x1/7“)
	2385	thread OZ (40x4 mm)

The filter provides reliable protection of breathing organs against solid and liquid aerosols, smoke-producing substances, radioactive particles, bacteria, viruses, vapours of organic and inorganic acids, hydroxides, organic solvents, with a boiling point above 65°C, ammonia, amines, acid gases, agricultural chemical combustion products, tear, irritant and other toxic substances, e.g. benzene, toluene, vinyl chloride, fluorine, hydrogen fluoride, sulphur oxides, phosgene, bromoacetone, CS substance, phosphoric acid and its organic derivatives, chloroacetic acid, nitric acid, aldehydes, mixtures of inorganic acids and organic substances.

Technical Specifications

Diameter	90 mm
Height	85 mm
Weight	200 g ± 5%
Storage life	5 years
Certified according to	EN 14387

Certified by Authorised body No. 235

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1]	Filter AVEC	EN [1]	Filter AVEC
260	230	980	860

Filter Class	Particle penetration test	Maximum penetration of test aerosol in %	
		EN [3]	Filter AVEC[4]
P3D	Sodium chloride	0,05	0,0002 - 0,05
	Paraffin oil	0,05	0,02 - 0,05

Type and Class	Test Gas		Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min		Penetration concentration	Dynamic Absorption Capacity of filter in grams	
			EN [1]	Filter AVEC[2]	obj. v %	mg/l	ml/m³	EN [1]	Filter AVEC[2]
A2	Cyclohexane	(C_6H_{12})	35	37	0,5	17,5	10	18,375	19,425
B1	Chlorine	(Cl_2)	20	>30	0,1	3	0,5	1,800	>2,700
	Hydrogen sulfide	(H_2S)	40	>60	0,1	1,4	10	1,680	>2,520
	Hydrogen cyanide	(HCN)	25	>160	0,1	1,1	10	0,825	>5,280
E1	Sulphur dioxide	(SO_2)	20	>30	0,1	2,7	5	1,620	>2,430
K1	Ammonia	(NH_3)	50	>60	0,1	0,7	25	1,050	>1,260

1) According to EN 14387 **2)** The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use. **3)** According to EN 143:2000 at the flow rate of 95 l/min **4)** At the flow rate of 95 l/min

filter A2B2E2K2NOP3D

Order Numbers	1631	thread Rd (40x1/7“)
	2631	thread OZ (40x4 mm)

The filter provides reliable protection of breathing organs against solid and liquid aerosols, smoke-producing substances, radioactive fallout, bacteria, viruses, vapours of organic and inorganic acids, hydroxides, organic solvents, with a boiling point above 65°C, ammonia, amines, acid gases, agricultural chemical combustion products, tear, irritant and other toxic substances, e.g. benzene, toluene, vinyl chloride, fluorine, hydrogen fluoride, sulphur oxides, phosgene, bromoacetone, CS substance, phosphoric acid and its organic derivatives, chloroacetic acid, nitric acid, oxides of nitrogen, aldehydes, mixtures of inorganic acids and organic substances.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	315 g ± 5%
Storage life	5 years
Certified according to	EN 14387
	EN 12941
	EN 12942

Certified by Authorised body No. 235

Filter Class	Particle penetration test	Maximum penetration of test aerosol in %	
		EN [3]	Filter AVEC[4]
P3D	Sodium chloride	0,05	0,0002 - 0,05
	Paraffin oil	0,05	0,02 - 0,05

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1]	Filter AVEC	EN [1]	Filter AVEC
260	170	980	600

Type and Class	Test Gas		Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min		Penetration concentration	Dynamic Absorption Capacity of filter in grams	
			EN [1]	Filter AVEC[2]	obj. v %	mg/l	ml/m³	EN [1]	Filter AVEC[2]
A2	Cyclohexane	(C_6H_{12})	35	39	0,5	17,5	10	18,375	20,475
B2	Chlorine	(Cl_2)	20	45	0,5	15	0,5	9,000	20,250
	Hydrogen sulfide	(H_2S)	40	>80	0,5	7,1	10	8,520	>17,040
	Hydrogen cyanide	(HCN)	25	50	0,5	5,6	10	4,200	8,400
E2	Sulphur dioxide	(SO_2)	20	25	0,5	13,3	5	7,980	9,975
K2	Ammonia	(NH_3)	40	50	0,5	3,5	25	4,200	5,250
NO	Nitrogen monoxide	(NO)	20	25	0,25	3,1	5	1,860	2,325
	Nitrogen dioxide	(NO_2)	20	25	0,25	4,8	5	2,880	3,600

1) According to EN 14387 **2)** The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use. **3)** According to EN 143:2000 at the flow rate of 95 l/min **4)** At the flow rate of 95 l/min

filter A2B2E2K2HgNOP3D

Order Numbers	1632	thread Rd (40x1/7“)
	2632	thread OZ (40x4 mm)

The filter provides reliable protection of breathing organs against solid and liquid aerosols, smoke-producing substances, radioactive fallout, bacteria, viruses, vapours of organic and inorganic acids, hydroxides, organic solvents, with a boiling point above 65°C, ammonia, amines, acid gases, agricultural chemical combustion products, tear, irritant and other toxic substances, e.g. benzene, toluene, vinyl chloride, fluorine, hydrogen fluoride, sulphur oxides, phosgene, bromoacetone, CS substance, phosphoric acid and its organic derivatives, chloroacetic acid, nitric acid, oxides of nitrogen, aldehydes, mixtures of inorganic acids and organic substances and vapours of mercury.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	320 g ± 5%
Storage life	5 years
Certified according to	EN 14387
	EN 12941
	EN 12942

Certified by Authorised body No. 235

Filter Class	Particle penetration test	Maximum penetration of test aerosol in %	
		EN [3]	Filter AVEC[4]
P3D	Sodium chloride	0,05	0,0002 - 0,05
	Paraffin oil	0,05	0,02 - 0,05

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1]	Filter AVEC	EN [1]	Filter AVEC
260	170	980	600

Type and Class	Test Gas		Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min		Penetration concentration	Dynamic Absorption Capacity of filter in grams	
			EN [1]	Filter AVEC[2]	obj. v %	mg/l	ml/m³	EN [1]	Filter AVEC[2]
A2	Cyclohexane	(C_6H_{12})	35	39	0,5	17,5	10	18,375	20,475
B2	Chlorine	(Cl_2)	20	45	0,5	15	0,5	9,000	20,250
	Hydrogen sulfide	(H_2S)	40	>80	0,5	7,1	10	8,520	>17,400
	Hydrogen cyanide	(HCN)	25	50	0,5	5,6	10	4,200	8,400
E2	Sulphur dioxide	(SO_2)	20	25	0,5	13,3	5	7,980	9,975
K2	Ammonia	(NH_3)	40	50	0,5	3,5	25	4,200	5,250
NO	Nitrogen monoxide	(NO)	20	25	0,25	3,1	5	1,860	2,325
	Nitrogen dioxide	(NO_2)	20	25	0,25	4,8	5	2,880	3,600
Hg[5])	Mercury	(Hg)	100 hours.	>100 hours.	1,6	13	0,1	39,000	>39,000

1) According to EN 14387, EN 403 **2)** The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use. **3)** According to EN 143:2000 at the flow rate of 95 l/min **4)** At flow rate of 95 l/min, **5)** Breakthrough time under test conditions in hours.

SPECIAL COMBINED ❹

filter A2K2COP3D

Order Numbers	1638	thread Rd (40x1/7“)
	2638	thread OZ (40x4 mm)

The filter is used for the protection of breathing organs against solid and liquid aerosols, smoke-producing substances, radioactive fallout, bacteria, viruses, vapours of organic amines and carbon monoxide.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	450 g ± 5%
Storage life	5 years
Certified according to	EN 403 EN 14387 EN 12941 EN 12942

Certified by Authorised body No. 235

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1])	Filter AVEC	EN [1])	Filter AVEC
260	180	980	700

Filter Class	Particle penetration test	Maximum penetration of test aerosol in %	
		EN [3])	Filter AVEC[4])
P3D	Sodium chloride	0,05	0,0002 - 0,05
	Paraffin oil	0,05	0,02 - 0,05

Type and Class	Test Gas		Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min		Penetration concentration	Dynamic Absorption Capacity of filter in grams	
			EN [1])	Filter AVEC[2])	obj. v %	mg/l	ml/m³	EN [1])	Filter AVEC[2])
A2	Cyclohexane	(C_6H_{12})	35	40	0,5	17,5	10	18,375	21,000
K2	Ammonia	(NH_3)	40	60	0,5	3,5	25	4,200	6,300
CO	Carbon monoxide	(CO)	20	25	0,5	3,5	25	2,100	2,625

1) According to EN 14387, DIN 3181-3 **2)** The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use. **3)** According to EN 143:2000 at the flow rate of 95 l/min **4)** At the flow rate of 95 l/min

❹ SPECIAL COMBINED

filter Reactor P3

Order Numbers	1073	thread Rd (40x1/7“)
	2073	thread OZ (40x4 mm)

The filter is designed for the protection of breathing organs against radioactive iodine, organic compounds of iodine (Iodomethane, 129, 131), radioactive dust, dust solid and liquid aerosols, smoke and smoke-producing substances. The filter must be replaced after use.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	295 g ± 5%
Storage life	5 years
Certified according to	EN 14387 EN 12941 EN 12942 ASTM, TS

Certified by Authorised body No. 235

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [5])	Filter AVEC	EN [5])	Filter AVEC
260	130	980	460

Filter Class	Particle penetration test	Maximum penetration of test aerosol in %	
		EN [3])	Filter AVEC[4])
P3D	Sodium chloride	0,05	0,0002 - 0,05
	Paraffin oil	0,05	0,02 - 0,05

Type and Class	Test Gas	Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min	Filter Efficiency	
		ASTM [1])	Filter AVEC[1])		ASTM [2])	Filter AVEC[2])
Reactor	Methyljodid 123, 131	240	>360	0,4 MBq/m³	99,5	99,995

1) According to ASTM. **2)** The filter efficiency is a laboratory quantity which applies under standard conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the measured Breakthrough time by a positive or negative variance, depending on the conditions of use. **3)** According to EN 143:2000 at the flow rate of 95 l/min **4)** At the flow rate of 95 l/min

SPECIAL COMBINED ❹

filter Hg Reactor P3

Order Numbers	1636	thread Rd (40x1/7“)
	2636	thread OZ (40x4 mm)

The filter is designed for the protection of breathing organs against mercury vapours, radioactive iodine, organic compounds of iodine (Iodomethane, 129, 131), radioactive dust, dust, solid and liquid aerosols, smoke and smoke-producing substances.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	295 g ± 5%
Storage life	5 years
Certified according to	EN 14387 EN 12941 EN 12942 ASTM, TS

Certified by Authorised body No. 235

Filter resistance in Pa			
At flow rate of 30 l/min		At flow rate of 95 l/min	
EN [1])	Filter AVEC	EN [1])	Filter AVEC
260	130	980	460

Filter Class	Particle penetration test	Maximum penetration of test aerosol in %	
		EN [3])	Filter AVEC[4])
P3D	Sodium chloride	0,05	0,0002 - 0,05
	Paraffin oil	0,05	0,02 - 0,05

Type and Class	Test Gas		Breakthrough time under test conditions in houres		Concentration of test gas in the air at the flow rate of 30 l/min		Penetration concentration	Dynamic Absorption Capacity of filter in grams	
			EN [1])	Filter AVEC[2])	obj. v %	mg/l	ml/m³	EN [1])	Filter AVEC[2])
Hg	Mercury	(Hg)	100 h	>100 h	1,6	13	0,1	39,000	>39,000

Type and Class	Test Gas	Breakthrough time under test conditions in minutes		Concentration of test gas in the air at the flow rate of 30 l/min	Filter Efficiency	
		ASTM [5])	Filter AVEC[5])		ASTM[6])	Filter AVEC[6])
Reactor	Methyljodid 123, 131	240	>360	0,4 MBq/m³	99,5	99,995

1) According to EN 403 **2)** The Breakthrough time and the Dynamic Absorption Capacity is a laboratory quantity which applies under normal conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the Breakthrough time measured according to EN 14387 by a positive or negative variance, depending on the conditions of use. **3)** According to EN 143:2000 at the flow rate of 95 l/min **4)** At the flow rate of 95 l/min **5)** According to ASTM **6)** The filter efficiency is a laboratory quantity which applies under standard conditions. It does not indicate the usable life of the filter in practice. The usable life of the filter may differ from the measured Breakthrough time by a positive or negative variance, depending on the conditions of use.

NBC - 1/SL Type A2B1E1K1P3D

Order Numbers	1701	thread Rd (40x1/7“)
	2701	thread OZ (40x4 mm)

The filter in combination with a full-face mask, gas helmet or independent filter-ventilation equipment provides reliable protection of breathing organs against solid and liquid aerosols, smoke-producing substances, radioactive particles, bacteria, viruses, vapours of organic and inorganic acids, hydroxides, organic solvents with a boiling point above 65 °C, ammonia, amines, acid gases, agricultural chemical combustion products, tear-producing, irritant, choking, blister and nerve substances, e.g. bromoacetone, CS substance, organic compounds of arsenic, phosgene, hydrogen cyanide, cyanogen chloride, mustard gas, organophosphates – sarin, IVA, VX and other toxic substances, e.g. benzene, toluene, vinyl chloride, fluorine, hydrogen fluoride, sulphur oxides, phosgene, phosphoric acid and its organic derivatives, chloroacetic acid, nitric acid, aldehydes, mixtures of inorganic acids and organic substances.

Technical Specifications

Diameter	90 mm
Height	85 mm
Weight	200 g ± 5%
Storage life	10 years
Certified according to	EN 14387 and manufacturer's TS

Certified by Authorised body No. 235

Filter use: Emergency and fire departments, police, army, civil defence, chemical and petrochemical industry, agriculture, health resort etc.
The filter in original packaging may be stored in the long-term at a temperature of – 5 °C to + 30 °C.
Further information on the product and manufacturer's technical specifications to be provided on sale.

NBC - 2/SL Type A2B2E2K2NOP3D

Order Numbers	1703	thread Rd (40x1/7“)
	2703	thread OZ (40x4 mm)

The filter in combination with a full-face mask, gas helmet or independent filter-ventilation equipment provides reliable protection of breathing organs against solid and liquid aerosols, smoke-producing substances, radioactive fallout, bacteria, viruses, vapours of organic and inorganic acids, hydroxides, organic solvents with a boiling point above 65 °C, ammonia, amines, acid gases, agricultural chemical combustion products, tear-producing, irritant, choking, blister and nerve substances, e.g. bromoacetone, CS substance, organic compounds of arsenic, phosgene, hydrogen cyanide, cyanogen chloride, mustard gas, organophosphates – sarin, IVA, VX and other toxic substances, e.g. benzene, toluene, vinyl chloride, fluorine, hydrogen fluoride, sulphur oxides, phosgene, phosphoric acid and its organic derivatives, chloroacetic acid, nitric acid, oxides of nitrogen, aldehydes, mixtures of inorganic acids and organic substances

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	315 g ± 5%
Storage life	20 years
Certified according to	EN 14387 EN 12941 EN 12942 and manufacturer's TS

Certified by Authorised body No. 235

Filter use: Emergency and fire departments, police, army, civil defence, chemical and petrochemical industry, agriculture, health resort etc.
The filter in original packaging may be stored in the long-term at a temperature of – 5 °C do + 30 °C.
Further information on the product and manufacturer's technical specifications to be provided on sale.

NBC - 3/SL Type A2B2E2K2HgNOP3D

Order Numbers	1704	thread Rd (40x1/7“)
	2704	thread OZ (40x4 mm)

The filter in combination with a full-face mask, gas helmet or independent filter-ventilation equipment provides reliable protection of breathing organs against solid and liquid aerosols, smoke-producing substances, radioactive fallout, bacteria, viruses, vapours of organic and inorganic acids, hydroxides, organic solvents with a boiling point above 65°C, ammonia, amines, acid gases, agricultural chemical combustion products, tear-producing, irritant, choking, blister and nerve substances, e.g. bromoacetone, CS substance, organic compounds of arsenic, phosgene, hydrogen cyanide, cyanogen chloride, mustard gas, organophosphates – sarin, IVA, VX and other toxic substances, e.g. benzene, toluene, vinyl chloride, fluorine, hydrogen fluoride, sulphur oxides, phosgene, phosphoric acid and its organic derivatives, chloroacetic acid, nitric acid, oxides of nitrogen, aldehydes, mixtures of inorganic acids and organic substances and mercury vapours.

Technical Specifications

Diameter	110 mm
Height	85 mm
Weight	320 g ± 5%
Storage life	20 years
Certified according to	EN 14387 EN 12941 EN 12942 and manufacturer's TS

Certified by Authorised body No. 235

Filter use: Emergency and fire departments, police, army, civil defence, chemical and petrochemical industry, agriculture, health resort etc.
The filter in original packaging may be stored in the long-term at a temperature of – 5°C do + 30°C.
Further information on the product and manufacturer's technical specifications to be provided on sale.

OF-07

The OF-07, in combination with a full-face protective mask or filter-ventilation equipment, provides reliable protection of air passages against solid particles, aerosols, irritant sprays (OC), smoke-producing substances, highly toxic particles, radioactive fallout, biological warfare agents – moulds, bacteria, viruses; irritants, choking, blister and nerve paralyzing, generally poisonous and psychoactive substances, such as: bromebenzylcyanide (CA), chloroacetophenone (CN), CR and CS substances, organic compounds of arsenic – CLARK I (DA), CLARK II (DC), adamsite (DM); phosgene (CG), diphosgene (DP), chloropicrin (PS); mustard gas (H), sulphur mustard gas (HD), T-mustard gas, Q-mustard gas, nitrogen mustard gases (HN1, HN2, HN3), lewisite (L), mixed mustard gas (H-L); G-agents: sarin (GB), cyklosin (GF) soman (GD), tabun (GA), IVA (GV)V-agents: VX, VR; hydrogen cyanide (AC), cyanides, cyanogen chloride (CK), BZ agent and harmful industrial pollutants according to the type of filter.

Screw thread: **STANAG 4155**
EN 148 Rd 40x1/7”

The OF-07 is a new type of protective filter that was specially developed for protection against the use of weapons of mass destruction or leaks of highly hazardous substances. The design of the filter provides low breathing resistance and, at the same time, a high level of user protection. The filter is compatible with all types of military and civil protective masks and powered filtering device with Rd 40x1/7” threads .

Substance	Constellation	Type
1,2-Dichloroethane	CH2ClCH2Cl	A
1,2-Dichloroethylene	CHClCHCl	AX
1,2-Dichloropropane	C3H6Cl2	A
1,4-Dioxane	C4H8O2	A
2-Amino ethanol	CH2OHCH2NH2	A
Acetaldehyde	CH3CHO	B,NO
Acetone	CH3COCH3	AX
Acetonitrile	CH3CN	A
Acetone cyanhydrin	CH3C (OH) (CN) CH3	A–P3
Agrochemicalis and		ABEKNOP3
Acrolein (2-Propenal)	CH2CHCHO	AX
Acrylonitrile	CH2CHCN	A–P3
Aldehydes	R·CHO	A-AX
Alcohols	R·OH	A
Allylchloride (3-chloride-1-propen)	CH2CHCH2Cl	AX
Ammonia	NH3	K
Aniline	C6H5NH2	A–P3
Maleic anhydride	C4H2O3	A–P3
Arsine	AsH3	B
Paint sprays, vapors		A–P3
Benzene	C6H6	A
Gasoline		A
Petrol		A
Benzyl bromide	C6H5CH2Br	A–P3
Beryllium	Be	P3
Bromine	Br2	B–P3
Bromomethane	CH3Br	AX
Chlorobromomethane	CH2ClBr	AX
Bromoform	CHBr3	A
Hydrogen bromide	HBr	B,E–P3
Butanone	CH3COC2H5	A
Butyl acrylate	CH2CHCOOC4H9	A
Butyl alcohols (butanols)	C4H9OH	A
Cyclohexane	C6H12	A
Cyclohexanol	C6H11OH	A
Cyclohexanone	C6H10O	A
Zyklon (hydrogen cyanide)		B
Aqueous ammonia	NH3H2O	K
DDT dust		B-P3
1,2-Dibromoethane	CH2BrCH2Br	A
Dichloromethane	CH2Cl2	AX
Sulfur dichloride	S2Cl2	B–P3
Nitrous fumes	NO, NO2, N2O5, HNO2, HNO3	NO
Lead fumes	Pb	P3
Epichlorhydrin	C3H5OCl	A,B–P3
Esters	R·COOR	A-AX
Acrylic acid-esters	CH2CHCOOR	A
Ethanolamine	CH2OHCH2NH2	A
Ethers	ROR	A-AX
Ethylene dichloride	CH2ClCH2Cl	A
Ethylene chloride	CH2ClCH2Cl	A
T-gas (etylene oxide)	(C2H4O)	AX
Ethyl alcohol (ethanol)	C2H5OH	A
Ethyl benzene	C6H5CH2CH3	A
Ethylene oxide (T-gas)	C2H4O	AX,B

Substance	Constellation	Type
Phenols		A
Phenylhydrazine	C6H5NHNH2	A,B
Formaldehyde (formalin)	HCHO	B–P3
Phosphine	PH3	B
Phosgene	COCl2	B
Furfuryl alcohol	C5H4O2	A
Halogenated hydrocarbons	R·Hal	A-AX
Halogens	Hal2	B
Hydrogen halogenides	HF, HCl, HBr, HJ	E–P3
Hexachlorocyclohexane	C6H6Cl6	A–P3
Hydrazine	N2H4	K–P3
Caustic soda	NaOH	P3
Sodium hydroxide	NaOH	P3
Chlorine	Cl2	B–P3
Phosphorus trichloride	PCl3	B–P3
Carbon tetrachloride	CCl4	A
Cyanogen chloride	ClCN	B
Chloroform	CHCl3	AX
Chloroprene	CH2C (C) CHCH2	AX
Hydrogen chloride	HCl	E–P3
Insecticide (organic)		A–P3
Isocyanates (organic)	R·NCO	B–P3
Isopropyl alcohol	CH3CH(OH)CH3	A
Iodine	J2	B–P3
Nickel tetracarbonyl	Ni (CO)4	CO–P3
Ketenes	R·CH2=CO	–
Ketones	R·CO·R	A
Cresols		A
Potassium cyanide (dust)	KCN	B–P3
Hydrogen cyanide	HCN	B
Acidic gases		E
Nitric acid	HNO3/H2O	NO
Hydrofluoric acid (hydrogen fluoride)	HF/H2O	E
Hydrochlorid acid	HCl/H2O	E–P3
Chlorosulfonic acid	ClSO3H	B–P3
Formic acid	HCOOH	E
Acetic acid	CH3COOH	E
Sulfuric acid	H2SO4	B–P3
Acids (fuming concentrated)		E–P3
Mercaptans	R·SH	B
Methylene chloride	CH2Cl2	AX
Methyl ethyl ketone (MEK)	CH3COC2H5	A
Chloromethane	CH3Cl	–
Methyl chloroform	CH3CCl3	A
Iodomethane	CH3J	AX
Iodomethane (129,131)	CH3J (129,131)	Reactor P3
Methyl alcohol (methanol)	CH3OH	AX
Methyl bromide	CH2Br	AX
Methyl chloride	CH3Cl	–
Diesel fuel		A
Dimethylformamide (DMF)	HCON(CH3)2	A
Nerveagents		NBC
Nitrogen oxides	NO, NO2, N2O5	NO
Butyl acetate	CH3COOC4H9	A

Substance	Constellation	Type
Ethyl acetate	CH3COOC2H5	A
Organic vapors, solvent		A, AX
Organic nitro compounds	R·NO2	A
Arsenic trioxide	As2O3	B-P3
Chlorine dioxide	ClO2	B
Quartz	SiO2	P3
Sulfur trioxide	(SO3)	P3
Sulfur dioxide	SO2	E
Carbon monoxide	CO	CO
Carbon dioxide	CO2	–
Vanadium pentoxide dust,fumes	V2O5	P3
Zinc oxide	ZnO	P3
Chromium oxide	Cr2O3, CrO3	P3
Ozone	O3	CO
Pentachloroethane	CHCl2CCl3	A
Iron pentacarbonyl	Fe(CO5)	CO–P3
Perchloroethylene	CCl2CCl2	A
Pesticides		A–P3
Polyacrylates		A–P3
Dust		P3
Metal fumes		P3
Propyl alcohol (propanol)	CH3CH2CH2OH	A
Pyridine	C5H5N	A
Iodine (radioactive)	J2	Reactor P3
Solvents		A
Mercury vapour	Hg	Hg–P3
Carbon black	C	P3
Hydrogen selenide	H2Se	B–P3
Carbon disulfide	CS2	B
Hydrogen sulfide	H2S	B
Nitro compounds (organic)	R·NO2	A
Mercury compounds		Hg–P3
Stibine	SbH3	B–P3
Styrene	C6H5CHCH2	A
Sulfuryl chloride	SO2Cl2	B
Turpentine		A
Tetrahydrofuran	C4H8O	A
Tetrachloroethylene	CCl2CCl2	A
1,1,2,2-Tetrachloroethane	CHCl2CHCl2	A
Tetrachloromethane	CCl4	A
Toluene	C6H5 · CH3	A
Tribromomethane	CHBr3	A
Trichloroethane (TCA)	CH3CCl3	A
Trichloroethylene (Tri)	C2HCl3	A
Trichloromethane	CHCl3	AX
Hydrocarbons	R·H	A
Vinyl acetate	C4H6O2	A
Vinyl chloride	CH2CHCl	AX
Vinylidene chloride	CH2CCl2	AX
Vinyltoluene	CH3C6H4CHCH2	A
Xylenes	CH3C6H4CH3	A
Mustard gas		NBC
DD-products (Desmodur-Desmophen)		A–P3
Sulfur compounds (burning)	(SO2)	E–P3

To make the assortment compyearse, the company also produces and supplies their own and selected manufacturers' protective equipment.

U-97

U-97: A mouthpiece assembly for work activity and leakage in the event of a chemical accident or fire. The body of the respirator is made of high-endurance plastic with an ergonomic mouthpiece from safe silicone rubber. The mouthpiece ensures perfect tightness and physiological comfort on the face. Sealing clamps are anatomically adapted to prevent the possibility of inhaling contaminated air through the nose. There is a head head harness in between the filter and the body of the respirator.

S-97

S-97: A half-mask made of safe, non-irritating, high-quality silicone rubber that enables long-term physiologic comfort during work activity and does not cause discomfort when in contact with sensitive skin. The S-97 is light-weight and easy to put on and remove from the protective position. The face-piece is produced in a universal size. The half-mask is available with two kinds of threads: OZ 40x4 mm or Rd 40 x 1/7".

CM6

CM-6M

CM6: A full-face mask with the possibility of fitting the filter on the left or right side of the face piece. The mask is fitted with a large-area polycarbonate panoramic visor. The **CM-6** is produced in three modifications. The **CM-6M** modification is completed with a drinking device. The CM-6S is supplied with an inner mask made of transparent silicone rubber. The face piece is produced in a universal size. The connection thread is Rd 40x1/7".

CM-5D

CM-5D: A full-face protective mask fitted with a divided eye-piece. The face piece is made of black, chemical-resistant rubber. The mask is available in two thread sizes: OZ 40x4 mm or Rd 40x1/7". The modified **CM-5DM** type is equipped with a drinking device. The mask is available in two sizes.

CM-4

CM-4: A binocular full-face mask. The face piece is available in 3 sizes. The mask is available in two thread sizes: OZ 40 x 4 mm (GOST) or Rd 40 x 1/7" (EN 148-1). The modified **CM-4M** type is equipped with a device for safe liquid intake with the mask on.

OM-90

OM-90: A military protective mask used by the Czech Army. The face piece is designed to provide a high level of protection from the effects of poisonous substances, biological warfare agents and radioactive fallout. The mask is fitted with a drinking device. The OM-90 is compatible with basic military optical devices including the KLARA Night scope. The face piece is available in three sizes. The connection thread is Rd 40x1/7".

3S

3S: A full-face protective mask with a panoramic visor. The mask is fitted with a belt designed to hang the mask around one's neck which allows the mask to be carried in an emergency position on the chest. The face piece of the mask is produced in a universal size. The inner mask is made of a special mixture which ensures perfect tightness, prevents exhaled air from entering the protective eye slit and, by doing so, prevents fogging. The Connection thread is Rd 40x1/7".
The 3S is available in a number of modifications: the **3S-Vg** with an visor of hardened glass, the **3S-H-F1** with a two-point fixing system enabling quick fastening to a helmet, the **3S-Si** with a silicone face piece, the **3S-small** with a face piece for users with small faces, etc.

3S Basic Plus

Mask 3S Basic Plus: A full-face protective mask specially designed for industrial use. The face piece of the mask is made of a mixture of natural rubber and provides long-term wearing comfort. The panoramic visor is scratch-proof and shock-proof. The visor is easily replaceable by removing it from the white frame. The five-point fixing system with metal clips enables very quick and easy donning and removal of the mask. The Connection thread is Rd 40x1/7".

Ultra Elite

The **Ultra Elite** full-face mask is based on an entirely new concept of protective devices developed in a close cooperation with fire fighting and chemical industry experts. The mask is fitted with a standard round thread RD 40x1/7" (EN 148-1). The inhalation chamber allows fitting to protective filters, powered air respirators and self contained breathing apparatuses. The Ultra Elite mask provides users with an undistorted, nearly 100% natural field of vision. The mask is available in a number of modifications.

ADVANTAGE

The modern **ADVANTAGE** full-face mask is fitted with a large-area panoramic visor. The face piece is made of soft silicone rubber which provides excellent long-term comfort of the mask. An entirely new head harness allows very quick and easy donning of the mask. To improve comfort, the mask is available in three different sizes. The Connection thread is Rd 40x1/7".

Accessories

The **AVEC BMF – 2000 bag** is made of high-quality materials which, in addition to their light weight, ensure long durability. The inner part of the bag provides room for 2 filters and a full-face mask. The filters are placed in the lower independent and separable part of the bag where they are firmly fixed and covered by a flap. When attached to the mask, the filter is placed in a case, ensuring the appropriate stability of the mask with the filter. The filter case may be easily removed by undoing the Velcro to gain the maximum inner room of the bag. The bag is equipped with a main adjustable shoulder strap and belt eyelets.

The **AVEC BMF – 07 bag** is equipped with a shoulder strap and a strap with a buckle for fixing the bag to the user's waist. The fixing strap can be easily removed by undoing the Velcro and the bag can be carried on a belt. The design of the bag prevents condensation and impurities from getting inside the bag. The reinforced walls of the bag provide better protection to both the protective mask and filters from mechanical damage. The inner part of the bag provides room for 2 filters and a full-face mask. The filters are placed in the lower independent and separable part of the bag where they are firmly fixed and covered by a flap. When attached to the mask the filter is placed in a case, ensuring the appropriate stability of the mask with the filter. The filter case may be easily removed by undoing the Velcro to gain maximum inner room of the bag. The bag is equipped with a main adjustable shoulder strap and belt eyelets

Mask spectacles are designed for users with eyesight defects. The rim is supplied without prescription glass.

The KFJ-15 filtration unit is special filter-ventilation equipment which supplies purified air, freed of harmful substances, to the full-face mask by means of connecting hoses. The set includes a ventilation unit, Combined filter, supply hoses, twin breathing hoses and full-face masks. The ventilation unit may be placed up to 50 m from the source of pollution, depending on the length of hoses. The user can carry out activities under conditions which prevent the use of a protective mask with a filter (e.g. tanks, sewer system, cisterns, boilers etc.). The unit enables two users to be connected at the same time.

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