



PPE: RESPIRATORY PROTECTION EQUIPMENT

CODE

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TYPES OF RESPIRATORY PROTECTION EQUIPMENT

A. DEPENDENT ON THE ENVIRONMENT (SELF-FILTERING EQUIPMENT)

In this case, the inhaled air passes through a filter where contaminants are retained. This category is subdivided into:

- **Particle filtering equipment:**
 - Particle filter (low, medium and high efficacy) plus a face piece
 - Half mask that filters particles
 - Ventilated filtering devices (helmets, etc.)
- **Gas and vapour filtering equipment:**
 - Gas filter and a face piece
 - Half mask that filters gas and vapour
- **Particle, gas and vapour filtering equipment**
 - Combined filter with a face piece
 - Half mask that filters particles, gases and vapours



B. INDEPENDENT OF THE ENVIRONMENT (ISOLATING EQUIPMENT)

Provides protection against contaminated environments and in areas where there is a lack of oxygen. Based on the supply of uncontaminated, breathable gas (air or oxygen). The main types are:

- **Supplied air respirator**
 - Hose fitted
 - Without assistance
 - Manual assistance
 - Ventilator assistance
 - With a compressed air line
 - Constant flow
 - On demand
 - Positive pressure on demand
- **Self-contained respirator**
 - Open-circuit
 - Compressed air
 - Compressed air, positive pressure on demand
 - Closed-circuit
 - Compressed oxygen
 - Liquid oxygen
 - Oxygen generation



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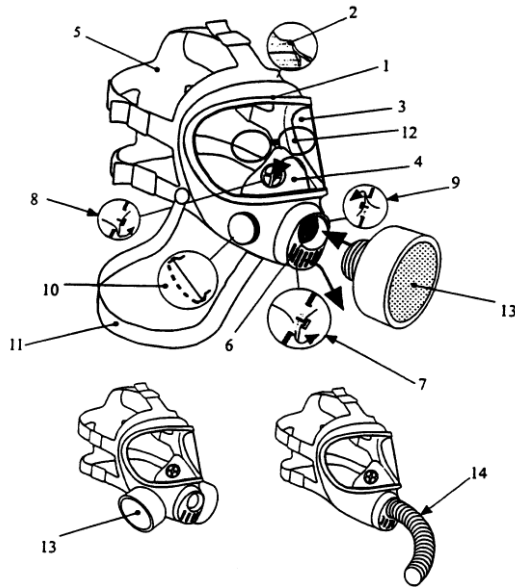
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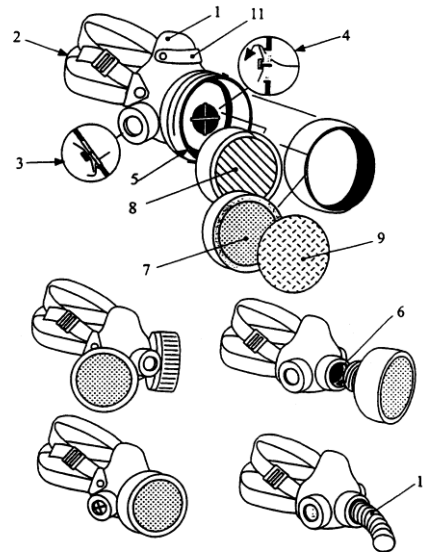
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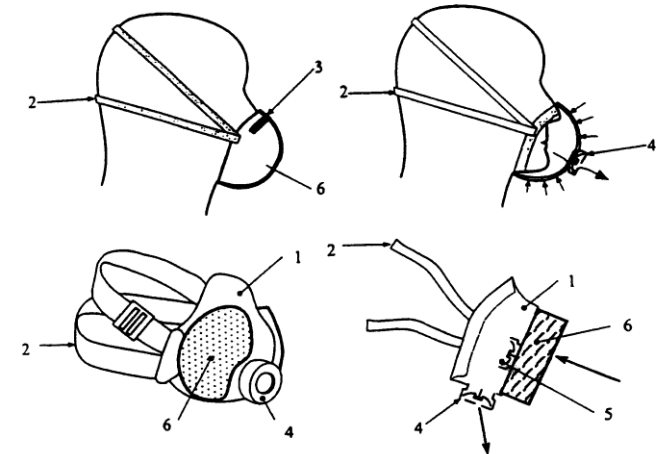
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- 1 Body of the full face mask
- 2 Edge of seal
- 3 Visor
- 4 Inner half mask
- 5 Head harness
- 6 Filter connector or holder
- 7 Exhalation valve
- 8 Inhalation valve for the inner half mask
- 9 Inhalation valve
- 10 Vibrating membrane
- 11 Carrying strap
- 12 Lenses
- 13 Filter
- 14 Breathing tube



- 1 Body of the half mask
- 2 Head harness
- 3 Exhalation valve
- 4 Inhalation valve
- 5 Filter connector or holder
- 6 Connector of the equipment
- 7 Particle filter
- 8 Gas and vapour filter
- 9 Pre-filter
- 10 Breathing tube
- 11 Nose clip



- 1 Body of the half mask
- 2 Head harness
- 3 Nose clip
- 4 Exhalation valve
- 5 Inhalation valve
- 6 Filter

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PROTECTION: PROTECTION FACTOR

The parameter that indicates the efficiency of the equipment is the protection factor.

The protection factor describes the ratio between the concentration of a harmful substance in the ambient air and its concentration in the air inhaled by the user of a respiratory protection device. There are several reasons why there may be a concentration of the harmful substance in the inhaled air:

- Penetration of ambient air through the filter.
- A broken seal of the exhalation valve.
- A problem with the connection between the filter and the filter holder and all the other connectors between the different pieces of the equipment.
- A bad fit between the face piece and the user's face.

The higher the protection factor, the greater the respiratory protection that is achieved.

To select suitable respiratory protection equipment for a specific use, the concentration of the harmful substance in the ambient air should be determined, as well as the protection factor.

To obtain the maximum concentration of the harmful substance in which the equipment can be used, multiply the protection factor for a specific piece of respiratory equipment by the constant concentration of the harmful substance in the ambient air.

Depending on how it works, respiratory protection equipment must protect against the following risks:

- **Hazards that affect the respiratory tract due to external actions**
 - Thermal hazards (splashes of molten metal, flames, sparks, etc.)
 - Chemical hazards (powders, fumes, fog, gases, vapours, etc.)
 - Contamination hazards (radioactive particles, radioactive gases, etc.)
 - Hazards due an oxygen-deficient atmosphere
- **Hazards to people due to action on the respiratory tract**
 - Biological risks (bacteria, viruses, etc.)
- **Health hazards or discomfort associated with the use of respiratory protection equipment**
 - Hazards due to discomfort at work associated with the use of respiratory protection equipment (size, weight, resistance to breathing, microclimate inside the mask, etc.).
 - Hazard due to inadequate selection and use, dirtiness, wear, deterioration and ageing.
 - Hazards related to the specific characteristics of the user.
 - Hazards related to the environment (heat, cold, humidity, etc.).



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MARKING

Respiratory protection equipment must be marked with the following:

- CE marking.
- Name, trademark or any other means of identifying the manufacturer or the authorised representative.
- Number of the harmonised regulation used to assess the product's conformity with essential health and safety requirements.
- Year of manufacture and expiry date.

SELECTION: RECOMMENDATIONS

1. Before personal protection equipment is purchased, the **table of risks** should be completed to obtain more accurate criteria.
2. The **manufacturer's information booklet** should be considered, and must include the following useful information:
 - Name and address of the manufacturer or authorised representative.
 - Available sizes, protection factor and explanation of markings.
 - Storage, use, maintenance, cleaning and disinfection.
 - Expiry date or service lifetime, etc.
3. Two factors should be considered when you choose equipment:
 - a. The technical factor: you should choose suitable equipment according to the existing hazards, determined by the risk analysis.
 - b. The ergonomic factor: out of the equipment that meets the technical requirements, select the item that best meets the personal characteristics of the user. The most important characteristics of the equipment in this respect are:
 - Does not hamper sight and hearing to a great extent and is as light as possible.
 - The head harness has an adjustment system that is comfortable under normal working conditions.
 - The parts of the face piece that are in contact with the user's face are made of soft material.
 - The material used in the face piece does not irritate the skin.
 - The filter is properly fitted and small.
 - The equipment hampers the user's breathing as little as possible.
4. Respiratory protection equipment is designed to be used over relatively short periods of time. As a general rule, users should not work with this equipment on for more than two hours. If the equipment is light or when light work is done with pauses between the different tasks, it can be used for longer periods.
5. Before a filter is used, it should be checked to ensure that it is in perfect condition and has not passed the expiry date printed on it.
6. A qualified person should instruct the user on how to use the respiratory protection equipment.

SAFETY AND HYGIENE REGULATIONS



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SELECTION OF PERSONAL PROTECTION EQUIPMENT (PPE): RESPIRATORY PROTECTION EQUIPMENT

FILTER	CHARACTERISTIC	TYPES	CLASS			COLOUR
			Low	Medium	High	
PARTICLE FILTER	Solid particles (S)	FFP1				White
	Solid and liquid particles (SL)	FFP2				White
	Solid and liquid particles	FFP3				White
FILTER FOR GAS, VAPOUR OR A COMBINATION (solid particles and/or liquids and/or gases and vapours)	Organic gases and vapours with a boiling point > 65°C	FFA	1	2	3	Brown
	Organic gases and vapours with a boiling point < 65°C	FFAX				Brown
	Inorganic gases and vapours according to the manufacturer's specifications	FFB	1	2	3	Grey
	SO ₂ and other acidic gases and vapours according to the manufacturer's specifications	FFE	1	2	3	Yellow
	NH ₃ and organic derivatives of NH ₃ according to the manufacturer's specifications	FFK	1	2	3	Green
	Specific gases and vapours	FFSX				Violet
	Nitrogen oxide (NO, NO ₂ , NO _x)	NO – P3		Combinations		Blue – White
	Mercury	HG – P3		Combinations		Red – White