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MILITARY STANDARD

RESPIRATORS, AIR FILTERING



FSC 4240

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DEPARTMENT OF DEFENSE
Washington, D. C. 20301

Respirators, Air Filtering

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1. This Military Standard is mandatory for use by all Departments and Agencies of the Department of Defense, to assure that selection of new items is limited to essential items, for which no comparable standard item exists.
2. Recommended corrections, additions, or deletions should be addressed to Commanding Officer, Edgewood Arsenal, ATTN: SMUEA-DE-ES, Edgewood Arsenal, Maryland 21010.

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FOREWORD

This standard is mandatory for use by all departments and agencies of the Department of Defense in the selection of items for application. It is intended to prevent entry of unnecessary items (sizes, types, varieties) into the Department of Defense logistics system. This is not a procurement document. This document is not intended to restrict any service in selecting new items to support state-of-the-art changes.

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1. SCOPE

1.1 Coverage. This standard is a presentation of nomenclature, technical description, military and typical commercial uses, directions for use, packaging data, labeling, general safety precautions, air filtering. This standard does not necessarily include all classifications of the items represented by the title or those which are commercially available. It does contain items preferred for use in the selection of respirators, air filtering for application by the Department of Defense. This standard covers the following five items.

<u>NAME</u>	<u>NO. OF ITEMS</u>
RESPIRATOR, AIR FILTERING, ORGANIC VAPORS	1
RESPIRATOR, AIR FILTERING, DUSTS, FUMES AND MISTS	1
RESPIRATOR, AIR FILTERING, PAINT SPRAYS AND ORGANIC VAPORS	1
RESPIRATOR, AIR FILTERING, PESTICIDES	1
RESPIRATOR, AIR FILTERING, DUST, ABC-M4	1

1.2 Application. Items listed herein accomodate essential requirements of the military and defense agencies, and will effect continued economies in all logistics functions when properly employed in new applications.

2. REFERENCED DOCUMENTS

The issues of the following documents in effect on the date of invitation for bids form a part of this standard to the extent specified herein.

Federal Specifications

GGG-M-125 Mask, Air Line: and Respirator, Air Filtering Industrial

Military Specifications

MIL-R-3308 Respirator, Air Filtering, Dust, ABC-M4

Military Standards

MIL-STD-129 Marking for Shipment and Storage

Technical Bulletin (Medical)

223 Respiratory Protective Devices

American Standards Publication

Z88.2 - 1969 American National Standard Practices for Respiratory Protection

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Z87.1 - 1968 American National Standard Practice for Occupational and Educational Eye and Face Protection

Department of the Interior - Bureau of Mines

Schedule 21 Filter-Type Dust, Fume, and Mist Respirators for Permissibility

Schedule 23 Nonemergency Gas Respirators (Chemical Cartridge Respirators, Including Paint Spray Respirators)

3. GLOSSARY

3.1 Definitions.

Air-filtering respirator. A respirator designed to remove contaminants from ambient air prior to its inhalation. The ambient air must have sufficient oxygen to sustain life.

Approved. Tested and listed as satisfactory by the Bureau of Mines, U.S. Department of Interior.

Cartridge. A small container filled with air-purifying media.

Chemical cartridge respirator. An air-purifying respirator equipped with one or more cartridges of small size filled with sorbents and catalysts that remove vapors and gases from ambient air prior to its inhalation. The cartridge may also contain a filter to remove particulate.

Contaminant. A harmful, irritating, or nuisance material that is foreign to the normal atmosphere.

Dust. Finely divided solid particles generated by mechanical processes.

Exhalation valve. A device that allows exhaled air to be expelled from a respirator and which prevents outside air from entering the respirator.

Facepiece. A tight-fitting covering that covers the wearer's nose and mouth and which may also cover his eyes and which makes an air-tight fit with his face. A head harness usually is included in the assembly of the facepiece.

Filter. A medium that removes particulate matter from air passing through it.

Fume. A solid condensation particle of extremely small size generally less than one micron in diameter.

Gas. An aeriform fluid which is in the gaseous state at ordinary temperatures and pressure.

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Half-mask facepiece. A tight fitting covering that covers the wearer's nose and mouth and which makes an air-tight fit with his face. A head harness usually is included in the assembly of the facepiece.

Head harness. A device that holds a facepiece securely in place on the wearer's face.

Inhalation valve. A device that allows respirable air to enter the respiratory-inlet covering of a respirator and which prevents air from leaving the covering through the intake port.

Mist. Suspended liquid droplets generated by condensing a vapor or disintegrating a liquid into an aerosol state.

Particulate matter. Finely divided solid or liquid particles. A suspension of particulate matter in air is commonly known as an aerosol.

Resistance. Opposition to the flow of air.

Respirable. Fit to be breathed.

Respirator. A device designed to protect the wearer from inhalation of harmful atmospheres.

Spray. Finely divided liquid particles generated by mechanical processes which are generally of larger average size than mist particles.

Threshold limit values. Refer to airborne concentrations of substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed for a 7 or 8 hour workday and 40 hour workweek without adverse effects.

Vapor. The gaseous state that is solid or liquid at ordinary temperature and pressure.

4. GENERAL REQUIREMENTS

4.1 Packaging data. The respirators, air filtering and related items included in this standard shall be packaged in accordance with the specifications listed for that item or as specified in the contract or order. All containers shall be marked for shipment and storage in accordance with MIL-STD-129.

4.2 Safety. Only general safety precautions are outlined in this standard. For more specific information the applicable safety or medical authorities must be consulted.

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4.3 Shelf life. Factors such as moisture, temperature, type and condition of containers, exposure to sunlight and the atmosphere cause variations in shelf life. Ideal storage conditions are outlined for each item. An approximate period of time after which these items will no longer be suitable for their intended use is also presented. The term "cool" denotes temperatures above freezing up to 100°F but not consistently over 100°F when stored out of direct sunlight. The term "dry" is usually used to denote an area where condensation does not come in contact with the packages or contents (for example, storing on pallets away from walls in an enclosure or building). Periodic examinations of the material or containers should be made more frequently when storage conditions vary from the ideal. All of the items covered in this standard containing rubber components are affected by sunlight and ozone and should be stored under proper conditions as specified. Each item should be examined prior to use. Shelf life is dated from the date of manufacture.

4.4 Use data. Respirators, air filtering covered in this standard are used to protect personnel in atmosphere that are not immediately dangerous to life or health, and from which the wearer can escape unharmed without the aid of the respirator. Such atmospheres, not immediately dangerous, will produce discomfort and possible chronic injury after repeated or prolonged exposure. Consequently these devices are not to be employed for respiratory protection where the atmospheres may become deficient in oxygen or where it may become immediately hazardous by reason of toxicity and concentration of the contaminant.

4.5 Interchangeability. Component parts are not interchangeable between manufacturers nor are they always interchangeable with different models produced by the same manufacturer. Respirators shall be purchased with sufficient extra filters or cartridges so that the facepiece can be discarded when filters or cartridges are consumed.

4.6 Approval. Respirators shall be tested and approved by the Bureau of Mines, U.S. Department of Interior, as provided in the Bureau of Mines Schedules 21B and 23B, or shall be tested and approved by the Bureau of Mines, U.S. Department of Interior, and the National Institute of Occupational Safety and Health, U.S. Department of Health, Education, and Welfare, as provided in Subparts K, L, and M of Part II, Subchapter B, Chapter 1, Title 30, Code of Federal Regulations.

5. DETAIL REQUIREMENTS

5.1 Name. RESPIRATOR, AIR FILTERING, ORGANIC VAPORS

5.1.1 Specifications. GGG-M125, Mask, Air Line: and Respirator, Air Filtering, Industrial - Type II.

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5.1.2 Technical description. The respirator, air filtering, organic vapors shall consist of a half mask facepiece made of rubber, flexible plastic, or other suitable elastomeric material. It shall have an exhalation valve(s) that allows respirable air to enter the facepiece and which prevents exhaled air from leaving the facepiece through the intake port(s), and one or two receptacles to accommodate the chemical cartridge(s) required. It shall have an inhalation valve(s) that allows respirable air to enter the facepiece and which prevents air from leaving the facepiece through the intake port(s). The head harness shall contain straps made of rubber, elastic braid, or a combination of elastic and non-elastic braid and shall contain easily adjustable buckles to insure a tight seal of the facepiece over the nose and mouth.

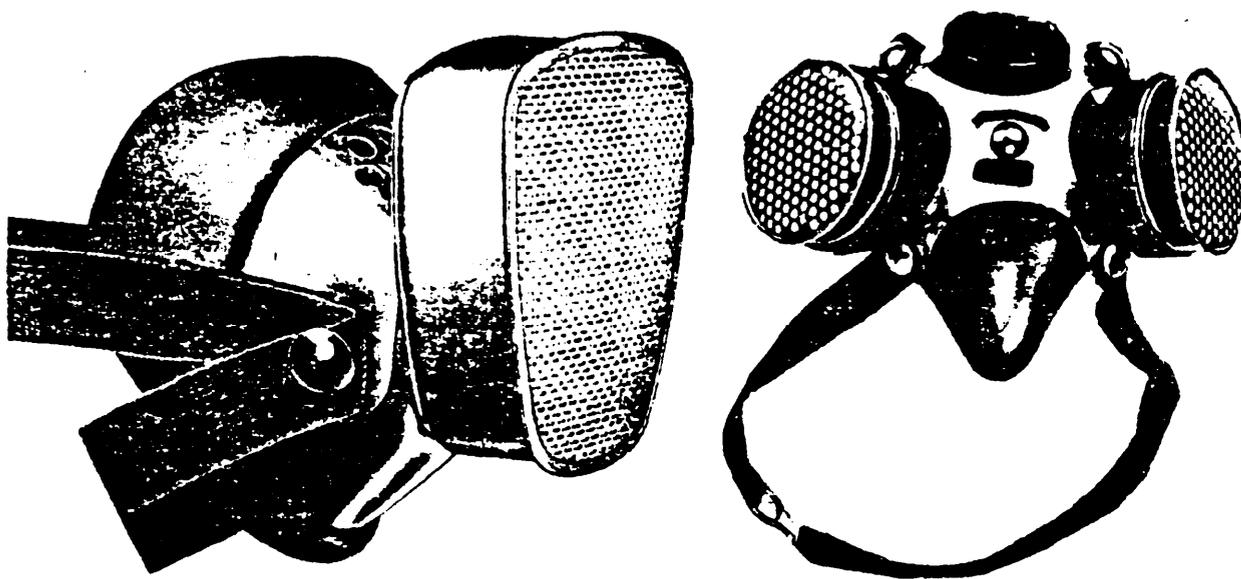


FIGURE 1. - Typical illustration of single and dual cartridge respirators for organic vapors.

5.1.2.1 Chemical cartridge. The chemical cartridge(s) shall provide protection against low concentrations of organic vapors. The cartridges(s) shall be so attached to the facepiece connection(s) as to be vapor-tight and result in the minimum resistance to breathing.

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5.1.3 Use data. The respirator is intended for military use by personnel who must handle organic materials which result in contaminating the air with low concentrations not exceeding 0.1 percent (1,000 parts per million) by volume of organic vapors such as acetone, alcohol, ether, toluene, gasoline, and petroleum distillates. Typical commercial applications for the respirator are the same as for the military. The respirator should not be used for respiratory protection against vapors with poor warning properties or those which generate high heats of reaction with sorbent or catalyst media in the cartridge.

5.1.4 Packaging data. For military use the respirator with a specified number of replaceable cartridges is packaged and packed in accordance with GGG-M-125.

5.1.5 Safety precautions. The respirator shall not be used against warfare agents, in an atmosphere containing less than 19.5 percent oxygen by volume at sea level pressure, in an atmosphere which is immediately dangerous to life or health, against substances which are absorbed by the body through the skin, against organic vapors which generate high heats of reaction with sorbent or catalyst media in the cartridge, and in an atmosphere which contains dusts, fumes, sprays, and mists. Respirators with half-mask facepieces do not afford protection for the eyes. Where required, appropriate eye protection shall be worn with half-mask facepieces and shall meet the pertinent requirements of American National Standard Practice for Occupational and Educational Eye and Face Protection Z87.1 - 1968.

5.1.6 Storage data. Respirators should be stored in the packages in which they are received in a cool, dry area out of direct sunlight and dampness. Under these conditions, the respirators and cartridges should have a shelf life of three years.

5.2 Name. RESPIRATOR, AIR FILTERING, DUSTS, FUMES AND MISTS

5.2.1 Specifications. GGG-M-125, Mask, Air Line: and Respirator, Air Filtering, Industrial - Type III, Class 1 and 2.

5.2.2 Technical description. The respirator, air filtering, dusts, fumes, and mists shall consist of a half-mask facepiece made of rubber, flexible plastic, or other suitable elastomeric material. It shall have an exhalation valve(s) that allows respirable air to enter the facepiece and which prevents exhaled air from leaving the facepiece through the intake port(s), and one or two receptacles to accommodate the filter(s) required. It shall have an inhalation valve(s) that allows respirable air to enter the facepiece and which prevents air from leaving the facepiece through the intake port(s). The head harness shall contain straps made of rubber, elastic braid, or a combination of elastic and non-elastic braid and shall contain easily adjustable buckles to insure a tight seal of the facepiece over the nose and mouth.

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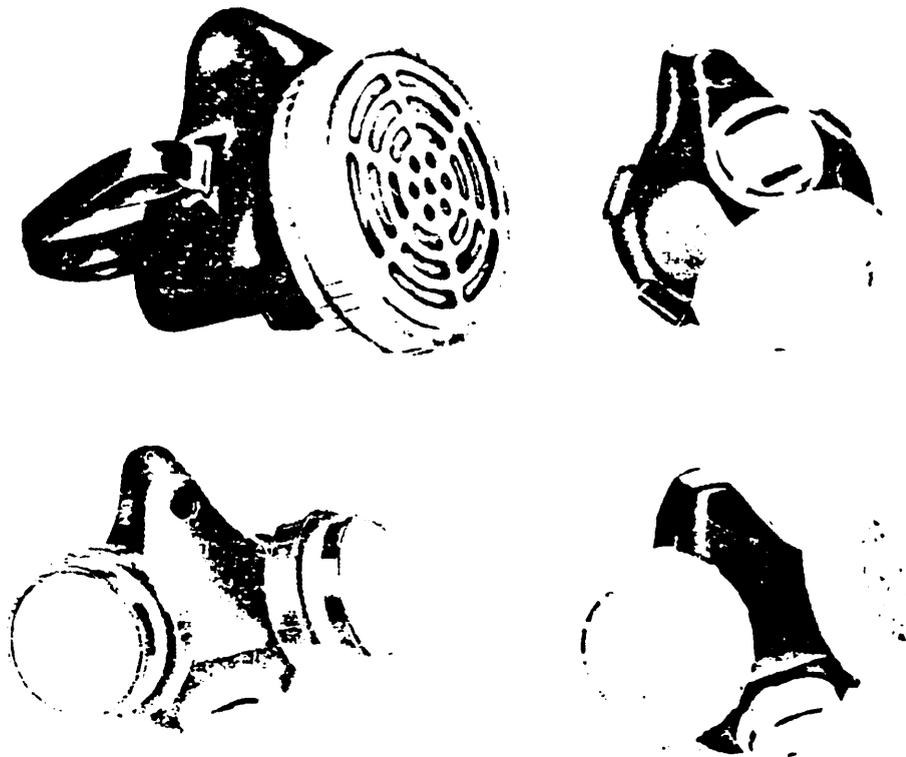


FIGURE 2. - Typical illustration of respirator, air filtering, dusts, mists or fumes

5.2.2.1 Filters. The filters shall be either dust, fume, or mist type as specified. The dust filter shall provide protection against dusts having a Threshold Limit Value not less than 2.4 million particles per cubic foot of air or 0.1 milligram particulate per cubic meter of air. The fume filter shall provide protection against fumes having a Threshold Limit Value not less than 0.1 milligram particulate per cubic meter of air. The filters shall be attached to the facepiece so as to be air-tight and result in a minimum resistance to breathing.

5.2.3 Use data. Respirators for dusts, fumes, or mists are intended for military use by personnel who are exposed to dusts generated by processes such as grinding, crushing, drilling, polishing, and blasting; or fumes generated by processes such as welding, calcination, and sublimation; or mists generated by processes such as spray coating with vitreous enamels, chromium plating and other processes involving the surface treatment of metals.

5.2.4 Packaging data. Same as 5.1.4.

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5.2.5 Safety precautions. The respirator shall not be used against war agents, in an atmosphere containing less than 19.5 percent oxygen by volume at sea level pressure, in an atmosphere immediately dangerous to life or health, against substances that are absorbed by the body through the skin, against substances of high toxicity that lack warning properties, in an atmosphere containing contaminating vapors and gases, and against dusts, fumes, sprays, and mists from which vapors or gases are evolved.

5.2.6 Storage data. Respirators and filters should be stored in the packages in which they are received in a cool, dry area out of direct sunlight and dampness. Under these conditions, the shelf life of the respirators and filters should be from five to eight years.

5.3 Name. RESPIRATOR, AIR FILTERING, PAINT SPRAYS AND ORGANIC VAPORS

5.3.1 Specifications. GGG-M-125, Mask, Air Line: and Respirator, Air Filtering, Industrial, Type IV, Class 4.

5.3.2 Technical description. The respirator, air-filtering, paint sprays, and organic vapors shall contain a half-mask facepiece made of rubber, flexible plastic, or other suitable elastomeric material. It shall be constructed of materials that can be frequently sterilized without showing evidence of deterioration. It shall have an exhalation valve designed to permit the passage of exhaled air. It shall have an inhalation valve(s) that allows respirable air to enter the facepiece and which prevents exhaled air from leaving the facepiece through the intake port(s). It shall contain one or two receptacles to accommodate the filter-adsorbent cartridges. The head harness shall contain straps made of rubber, elastic braid, or a combination of elastic and non-elastic braid and shall contain easily adjustable buckles to insure a tight seal of the facepiece over the nose and mouth.

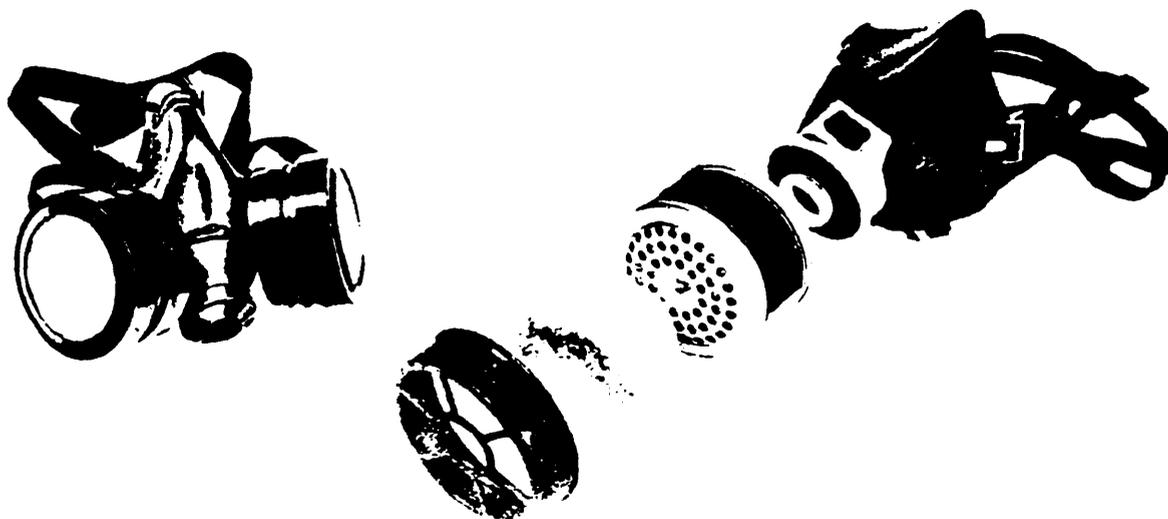


FIGURE 3. - Typical illustration of single and double cartridge respirators for paint sprays and organic vapors

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5.3.2.1 Filter-adsorbent cartridge. The filter shall be incorporated in or firmly attached to the cartridge and shall be located on the inlet side of the cartridge upstream of the adsorbent. The filter shall provide protection against either dusts having a Threshold Limit Value not less than 2.4 million particles per cubic foot of air or 0.1 milligram particulate per cubic meter of air or fumes having a Threshold Limit Value not less than 0.1 milligram particulate per cubic meter of air as required. The cartridges shall provide protection against low concentrations of organic vapors not exceeding 0.1 percent (1,000 parts per million) by volume. The cartridge(s) shall be so attached to the facepiece connection(s) as to be gas-tight and result in the minimum resistance to breathing.

5.3.3 Use data. The respirator is intended for military use in the protection of personnel against particulates and organic vapors generated during paint spraying operations. Typical commercial applications are the same.

5.3.4 Packaging data. Same as 5.1.4.

5.3.5 Safety precautions. The respirator shall not be used against war agents, in an atmosphere containing less than 19.5 percent oxygen by volume at sea level pressure, in an atmosphere immediately dangerous to life or health, against substances that are absorbed by the body through the skin, and against substances of high toxicity that lack warning properties.

5.3.6 Storage data. Respirators and filter-adsorbent cartridges should be stored in the packages in which they are received in a cool, dry area out of direct sunlight and dampness. Under these conditions, the respirators and filter-adsorbent cartridges should have a shelf life of three years.

5.4 Name. RESPIRATOR, AIR FILTERING, PESTICIDES

5.4.1 Specifications. None.

5.4.2 Technical description. The respirator, air filtering, pesticides shall contain a half-mask facepiece made of rubber, flexible plastic, or other suitable elastomeric material. It shall have an inhalation valve designed to permit the passage of exhaled air. It shall have an inhalation valve(s) that allows respirable air to enter the facepiece and which prevents exhaled air from leaving the facepiece through the intake port(s). The respirator shall be equipped with one or two receptacles to accommodate the filter adsorbent cartridge(s) required. The head harness shall contain straps made of rubber, elastic braid, or a combination of elastic and non-elastic braid and shall contain easily adjustable buckles to insure a tight seal of the facepiece over the nose and mouth.

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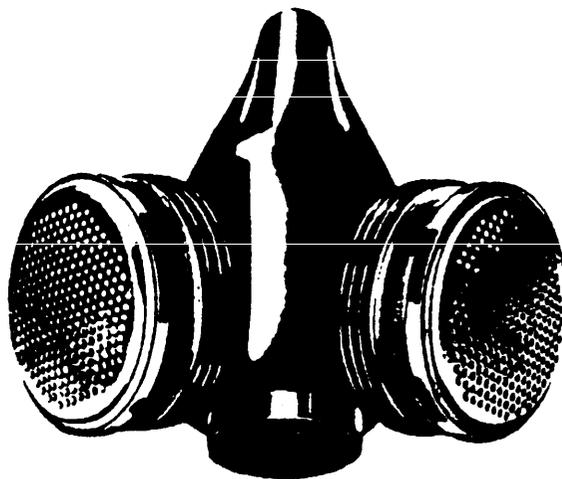


FIGURE 4. - Typical illustration of respirator, pesticides

5.4.2.1 Filter adsorbent cartridge. The filter adsorbent cartridge shall provide protection for toxic pesticides in dust, mist, spray, or vapor form. The filter shall be incorporated in or firmly attached to the cartridge and shall be located on the inlet side of the cartridge upstream of the adsorbent. The cartridge(s) shall be so attached to the facepiece connection(s) as to be gas-tight and result in the minimum resistance to breathing.

5.4.3 Use data. The respirator is intended for military use in the protection of personnel against toxic pesticides in the field such as insecticides, fungicides, herbicides, and rodenticides in the form of dusts, sprays, mists, and vapors.

5.4.4 Packaging data. For military use the respirator is packaged and packed in accordance with the contract order.

5.4.5 Safety precautions. The respirator shall not be used against war agents, in an atmosphere containing less than 19.5 percent oxygen by volume at sea level pressure, in an atmosphere immediately dangerous to life or health, against substances that are absorbed by the body through the skin, against substances of high toxicity that lack warning properties, and against fumigants.

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5.4.6 Storage data. Respirators and filter-adsorbent cartridges should be stored in the packages in which they are received in a cool, dry area out of sunlight and dampness. Under these conditions, the respirators and filter adsorbent cartridges should have a shelf life of three years.

5.5. Name. RESPIRATOR, AIR FILTERING, DUST, ABC-M⁴

5.5.1 Specifications. MIL-R-3308, Respirator, Air Filtering, Dust, ABC-M⁴.

5.5.2 Technical description. The M⁴ respirator, air filtering, dust shall be a half mask type consisting of an olive drab jersey-knit cotton cloth panel serving as the filter pad, and an aluminum stiffening strip with spring wires for shaping the respirator to the face. Additional spring wires shall be provided at the cheek positions. The head harness shall consist of a single elastic material strap with an easily adjustable buckle.



FIGURE 5. - Typical illustration of respirator, ABC-M⁴

5.5.3 Use data. The M⁴ respirator is intended for military use in shielding the nose and mouth from coarse dust particles and is not intended for protection against industrial dusts. Typical commercial applications are the same.

5.5.4 Packaging data. The M⁴ respirator is packaged and packed in accordance with MIL-R-3308.

5.5.5 Safety precautions. The M⁴ respirator should be cleaned before and after each use to insure protection.

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5.5.6 Storage data. The M4 respirator should be stored in the packages in which they are received in a cool, dry area out of direct sunlight. Under ideal storage conditions the respirators shall have an indefinite shelf life.

NOTICE. - Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer.

INTERNATIONAL INTEREST. - Certain provisions, (Par 5.5) of this standard is the subject of international standardization agreement ABC-M4. When amendment revision or cancellation of this standard is proposed which will effect or violate the international agreement concerned, the preparing activity will take appropriate reconciliation action through international standardization channels, including departmental standardization offices, if required.

Custodians: ARMY - MU Preparing Activity: ARMY - MU
 NAVY - YD
 AIR FORCE - 84

Review Activities: ARMY - MD
 NAVY - YD
 AIR FORCE - 84

User Activities: ARMY - AT, ME
 NAVY - SH, MC, AS, SA

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