

**MIL-STD-1431**

**5 September 1969**

**MILITARY STANDARD**  
**AURAL PROTECTOR, SOUND**



**FSC 4240**

MIL-STD-1431  
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DEPARTMENT OF DEFENSE  
Washington, D. C. 20301

**Aural Protector, Sound**

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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. This document is not intended to restrict any service in selecting new items required to support state-of-the-art changes.
2. Recommended corrections, additions, or deletions, should be addressed to Commanding Officer, Edgewood Arsenal, ATTN: SMUEA-TSE-SM, Edgewood Arsenal, Maryland 21010.

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#### FOREWORD

This is the first book format standard generated on Aural Protector, Sound. This document is mandatory for use by all departments and agencies of the Department of Defense in selecting items for application. It is intended to prevent the 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 required to support state-of-the-art changes.

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## 1. SCOPE

1.1 Coverage. This standard is a presentation of data, including but not limited to the general requirements of design and construction, protective treatment and shelf life, and the detail requirements of nomenclature, use data, safety precautions, packaging, marking and storage of all military standard hearing protectors. This standard does not necessarily contain all classifications of the item represented by the title or those which are commercially available. It does include the item preferred for use in the selection of a hearing protector for application by the Department of Defense that is specifically circumaural in design. Hereafter, in the definitive and descriptive areas of this standard, reference will be made to circumaural protectors. This standard covers the following item:

### NAME

AURAL PROTECTOR, SOUND

1.2 Application. Items listed herein accommodate 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.

### Military Specifications

MIL-P-38268 (USAF)                      Protector, Ear, Sound PRU-1A/P

### Test Methods

Z-24,22-1957                              United States of America Standards Institute;  
"Method for the Measurement of the Real-Ear  
Attenuation of Ear Protectors at Threshold".

## 3. GLOSSARY

### 3.1 Definitions

Attenuation - A reduction of sound pressure usually used to measure the efficiency of personal hearing protective devices.

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**Circumaural Protector** - A hearing protective device that covers the wearer's ear completely, sealing itself against sound by contact with the bone structure surrounding the ear.

**Decibel** - The unit used to measure sound or noise levels. In this case, it is 20 micronewtons per square meter (equivalent .0002 dynes per square centimeter).

**Frequency** - The rate at which sound pressure waves alternate, expressed in Hertz (Hz/s).

**Noise** - Noise is sound. The term noise is usually associated with an irritating or unpleasant sound.

**Noise Level** - The weighted sound pressure level in which the weighting must be indicated and referenced in terms of some measuring units.

**Sound** - Anything that can be heard; rapid pulsations of air pressure that the hearing mechanism converts to nerve impulses recognized by the brain.

#### 4. GENERAL REQUIREMENTS

4.1 Design and construction - The circumaural protector shall be designed to be worn by all personnel, including personnel wearing spectacles, who are subjected to high intensity sound. The protector will have a minimum number of parts, consistent with reliability, and shall be designed to permit easy assembly and disassembly with commercially available tools.

4.2 Wearability - The circumaural protector shall have no design or material properties that might cause discomfort or affect wearability.

4.3 Weight - The weight of the complete circumaural protector shall not be greater than 16 ounces.

4.4 Protective treatment - Materials that are subject to corrosion in oxygen, salt air, or any other atmospheric conditions likely to occur during service usage will be protected against such corrosion in a manner that shall in no way prevent compliance with performance requirements. Any protective coating that will crack, chip, or scale with age or extremes of atmospheric conditions shall not be used.

4.5 Finish - If aluminum parts are used, they will be anodized in accordance with Type II of MIL-A-8625.

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4.6 Materials - Materials shall conform to applicable specifications. Materials for which there are no applicable specifications, or which are not specifically described in this standard, will be of the best quality and entirely suitable for the purpose intended.

4.7 Interchangeability and substitutability - Interchangeable parts having the same manufacturer's part number will be functionally and dimensionally interchangeable. Component parts need not be interchangeable between manufacturers and may not be interchangeable with different models produced by the same manufacturer.

4.8 Shelf life - Factors such as moisture, temperature, type of container and extended exposure to direct sunlight may cause variations in shelf life. The subjection of protectors to storage conditions other than ideal may cause cracks, blisters, softening or brittleness that would lessen the resiliency and useful life of the item. Under ideal conditions, (5.1.6 - Storage data) the protectors should have indefinite shelf life. Shelf life is dated from the date of manufacture.

#### 5. DETAIL REQUIREMENTS

5.1 Name - AURAL PROTECTOR, SOUND

5.1.1 Specification - MIL-P-38268 (USAF), Protector, Ear, Sound PRU-1 A/P. Except as noted hereafter, the circumaural protector shall meet the requirements of Military Specification MIL-P-38268.

5.1.2 Technical description - The circumaural protector consists essentially of a suspension assembly and an earcup assembly.

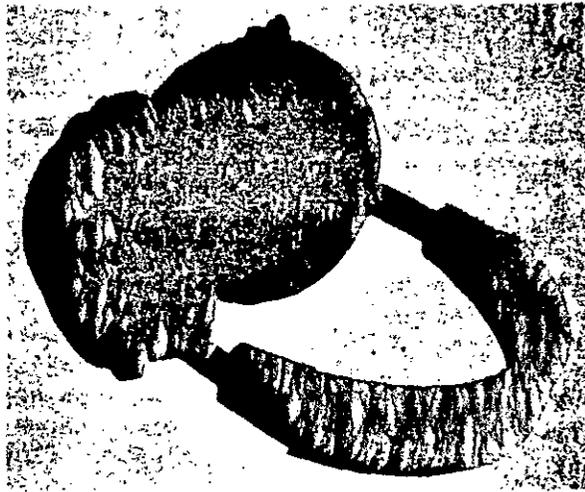


FIGURE 1. - Typical illustration of a circumaural protector

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5.1.2.1 Suspension assembly - The suspension assembly consists of a headband, headpad, and attachment assembly.

5.1.2.2 Headband - The headband shall be designed so that the earcups can be adjusted vertically to suit the user. The tension of the headband will not cause the earcups to exert greater than 4-1/2 pounds pressure against the user's head in the extended position of the vertical adjustment. Less tension will be acceptable provided the sound-attenuating qualities and wearer comfort are not sacrificed. All edges will be rounded.

5.1.2.3 Headpad - The headpad, when required, will provide cushioning between the headband and the user's head. The thickness of the pad will be sufficient to insure comfort and to prevent the headband from contacting the user's head. The material used for the headpad will not harden when exposed to a low temperature (minus 20°F) and will not become sticky when exposed to a high temperature (plus 160°F). The material shall be of a closed cell type that will not absorb moisture.

5.1.2.4 Attachment assembly - The attachment assembly will be designed so that the earcups are permanently attached to the headband. The attachment assembly will allow sufficient vertical and angular movement of the earcups to insure that the earcups will fit over the ears and evenly against the user's head.

5.1.2.5 Earcup assembly - The earcup assembly will consist of earcups, seals, and fillers.

5.1.2.6 Earcups - Each circumaural protector will have two cups. The materials used to fabricate the earcups shall meet the requirements of this military standard. If an earcup is constructed of more than one piece, the pieces should be permanently joined together and all seams should be smooth. The earcups should be free from sharp corners. The size of the earcups shall be the minimum necessary to provide the attenuation specified. If the design of the earcups necessitates differentiation between the front and the back of the earcups, permanent designation markings will be provided. Earcups of protectors produced by the same manufacturer should be interchangeable within an individual model.

5.1.2.7 Earcup seals - The earcup seals should be designed as replaceable items and furnished as spares if required. The seals will be designed to conform to various head contours. The seals shall not be cemented to the earcups; however, the seals will remain attached to the earcups during normal usage of the circumaural protector but remain easily replaceable. Materials coming in contact with the skin will be of the closed-cell type and will not be treated in any manner that might cause skin irritations. The earcup seals may be foam, foam or grease filled, or fluid-filled provided they meet all other requirements.

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5.1.2.8 Earcup fillers - If earcup fillers are used, they should be installed in the earcup cavities so that the material will not normally come in contact with the user's ears. The fillers will be designed so that they can be removed from the ear cup cavities and replaced without damage to the fillers or earcups. The filler material should not be glued to the earcups. The material used for the earcup fillers will assure that the specified sound-attenuation requirements are met. The material shall not cause skin irritation.

5.1.2.9 Sound attenuation of the circumaural protector - The sound-attenuation of the protector shall be as specified in Table I when measured in accordance with the United States of America Standards Institute, "Method for the Measurement of the Real-Ear Attenuation of Ear Protectors at the Threshold".

TABLE I Sound attenuation requirements

Group	Test frequencies Hertz/second	Minimum group attenuation (decibels)
A	125 250	25
B	500 1000 2000 3000 4000	185
C	6000 8000	60

The minimum group attenuation is the sum of the attenuation measured for the test frequencies contained in that group. The acceptable minimum sound attenuation for each of the single test frequencies contained in group B shall be 25 decibels for 500 Hz and 35 decibels for 1000, 2000, 3000, and 4000 Hz. Attenuation will be tested at all the test frequencies listed in Table I.

5.1.3 Use data - Repeated exposure to high intensity noise could result in significant loss of hearing in some individuals. Knowledge of the relationship between exposure to noise and hearing loss is sufficiently well established to permit the identification of noise exposure against which the hearing mechanism and resultant hearing ability, should be protected. In areas where excessive noise levels cannot be reduced by other means, personal hearing protective devices must be worn. In general, the initiation of a hearing conservation program is indicated if the noise level exceeds 90 decibels. Sensitivity to noise levels varies with the individual. This circumaural protector is intended for use in such areas.

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5.1.4 Safety precautions - This circumaural protector will be inspected before each use for visible defects. In general, the effectiveness of the protector is determined by its headband tension and its fit over the ear. If headband tension is decreased too much, either by usage or by the individual wearer, attenuation is decreased.

5.1.5 Packaging data - Unless otherwise specified, the circumaural protector will be packaged in accordance with accepted commercial practices. Procurement document should specify selection of applicable level of packaging, packing and preservation.

5.1.5.1 Packaging - Unless otherwise specified, the circumaural protector will be prepared for shipment to permit acceptance by common or other carriers for transportation at the lowest applicable rate, and to afford maximum protection from normal hazards of transportation.

5.1.5.2 Marking - Unless otherwise specified, issue packages will be marked with the name of the commodity, the quantity, the name of the contractor, the number of the contract or order, and the name and address of the consignee.

5.1.6 Storage data - Whenever possible, circumaural protectors should be stored in the original packing in a storage facility that is normally cool and dry. Under these ideal conditions, packages should be spot-checked every six months for deterioration or more frequently if storage conditions vary from the ideal.

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

Assignee activity: US Army Munitions Command

Custodians: Army - MU                      Preparing activity: Army - MI  
              Navy - SH  
              Air Force - 84

Review activities: Army - EL

User activities: Army - ME, MI  
                  Navy - CG

Project No. 4240-0173



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