

MINIMUM DESIGN STANDARDS FOR
SMOKE PROTECTION GOGGLES FOR AIR TRANSPORT CREW

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Revised

1. SCOPE - This Aerospace Standard covers goggles to be used in conjunction with an oronasal oxygen mask and a demand regulator delivering "safety pressure" oxygen during cockpit smoke emergency situations on civil air transports.

2. MATERIALS (GENERAL REQUIREMENTS)

2.1 The materials used in the manufacture of smoke goggles shall not:

- a. Contaminate oxygen.
- b. Be adversely affected by continuous contact with oxygen.
- c. Contain or cause objectionable odors.
- d. Be allergenic or irritating when in contact with the skin.
- e. Be affected by ozone to a harmful extent.
- f. Be lesser than flame resistant, by treatment or selection, as defined in the Civil Air Regulations.

2.2 The finish of the frame, face seal and other components within the field of vision shall be non-reflective to the greatest possible degree.

3. GENERAL DESIGN STANDARDS

3.1 Head Band - A head band shall be included as part of the goggle assembly to secure the goggles in place. The head band shall conform to the following requirements:

- a. Shall be as comfortable as possible in keeping with the need for positive retention of the goggles over the eyes.
- b. Shall be readily adjustable (if required by the selection of materials), preferably with one hand, to provide the degree of pressure on the face required by the individual for adequate sealing.
- c. Shall be free of hooks, clips, or other devices which tend to snag the hair, the suspension of the oxygen mask or eye glasses.

3.2 Eye-Pieces - The eye-pieces, or lenses, shall possess the following qualities for maximum safety, convenience, and utility:

- a. The field of vision provided by the goggles must be at least 180° in the horizontal plane and 135° in the vertical plane.
- b. Lenses shall be of the safety shatter-proof type of material and shall be replaceable. Lenses shall meet the requirements of the American Standard Safety Code and may be rigid or flexible.
- c. Lenses shall possess the maximum degree of optical clarity attainable in the material selected. Clarity, freedom from distortion, and transmission of light shall be approximately equal to that of ground glass.

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- d. Lenses shall either be clear or yellow-tinted. The yellow-tinted lenses offer the additional advantage of excluding the short-wave length light (blue smoke haze) while admitting 90% of long-wave length light (red and yellow).
- 3.3 Sealing Gasket - The seal around the goggles must effectively eliminate the entrance of smoke, even when the goggles are worn over eye glasses. On goggles which are pressure-ventilated by the bleeding of oxygen from the mask into the goggle cavity, sealing is not so critical, since any existing leakage is outward.
- 3.4 Defogging - Goggle lenses must either be chemically coated (or treated) to minimize fogging, or shall be defogged by a bleed tube (or tubes) from the oxygen mask to direct a flow of oxygen across the lenses. The flow into the goggles shall be the minimum amount required to provide the intended effect.
- 3.5 Initial Decontamination - Goggles shall be provided with a means of excluding or eliminating any acrid fumes or smoke entrapped within the goggle cavity after initial donning. One acceptable method of accomplishing this is by bleeding oxygen from the mask into the goggle cavity.
- 3.6 Size and Weight - The goggle assembly shall be as light in weight as practicable to eliminate any unnecessary discomfort to the wearer. Size and weight shall be kept to a minimum to simplify stowage facilities.
- 3.7 Flexibility - The goggle assembly shall be flexible and pliable to enhance wearer comfort and to reduce damage to the goggles while being handled and stowed.
- 3.8 Compatibility - The goggles shall be compatible for use with the type of oronasal oxygen mask with which it is to be used. The goggle cavity must be large enough to accommodate aviator type sunglasses and common types of corrective spectacles.
4. SERVICE LIFE - Goggles provided under this standard must be so designed and constructed that in normal usage they can be expected to remain in a satisfactory serviceable condition for a minimum period of time to be specified by the manufacturer.
5. TEST REQUIREMENTS - The ability of the goggles to conform to the requirements of paragraph 3 must be demonstrated. Testing shall consist of exposing several human subjects wearing the goggles over spectacles to intense smoke for at least 15 minutes. Compatible oxygen masks shall be worn by each subject. The goggles are to be donned after onset of the smoke condition to certify compliance with paragraph 3.5.

PREPARED BY

SAE COMMITTEE A-10, AIRCRAFT OXYGEN EQUIPMENT