

AEROSPACE INFORMATION REPORT

SAE AIR1176

REV.
B

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Oxygen System and Component Cleaning and Packaging

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FOREWORD

The cleaning methods and agents described in this document are subject to change by regulatory decree.

The following agencies are known to affect the workplace:

Agencies Involved:

ACGIH	American Conference of Governmental Industrial Hygienists
AQMD	Air Quality Metropolitan District - Los Angeles Basin
CAL-OSHA	California Occupational Safety and Health Administration
EPA	Environmental Protection Agency
FDA	Food and Drug Administration
HESIS	Hazard Evaluation System and Information Service
IARC	Internal Agency for Research on Cancer
NIOSH	National Institute of Safety and Health
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration

Items of Concern:

- a. Phase-out of "FREON" and substitution of alternate materials. Alternate materials are predicted to be more costly by an order of magnitude and incompatible with existing machinery.
- b. More restrictive regulations on release of volatile materials. (Example: Ban on use of hydrofluoric acid in oil refineries but approval to use sulfuric acid which will require 100 times more quantity.)

1. SCOPE:

This Aerospace Information Report (AIR) specifies work area details, cleaning methods, test methods, and specifications for oxygen clean parts and packaging materials.

1.1 Purpose:

This document provides minimum requirements for work areas, cleaning, and packaging of aircraft oxygen systems and components, the normal working pressures of which are 5 psig (0.34 bar) or greater.

2. REFERENCES:

FED-STD-313C	Material Safety Data Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities
USAF T.O.00-25-203	Contamination Control of Aerospace Facilities

3. GENERAL:

- 3.1 All oxygen systems and components must be free (less than 26.9 mg/m² of surface area) of incompatible oils and grease, or any other combustible fluid or compound. The components must also be free of oxidizable organic particles and shreds of easily oxidizable metals, such as aluminum, magnesium, iron, lint, excelsior, shredded paper, or any other combustible material.
- 3.2 Oxygen system components, including supply plumbing, can most effectively be cleaned when not installed in the system. Components containing plastic or elastomeric parts are subject to damage when exposed to some cleaning agents, and their resulting odors are difficult to satisfactorily remove. Contaminants such as oils, dust, metal chips, etc., cannot be easily removed by gas purging or liquid flushing within the installed system. Such contaminants can eventually become trapped in some narrow orifice causing either partial or complete failure of the system. In addition, if the contaminant is of a combustible type, the fire hazard is increased. Such contaminants can only be removed by complete disassembly of the affected components, followed by proper cleaning procedures and controlled handling of the clean components until reinstallation into the using system.

4. WORK AREA:

The room should be of adequate size, isolated from oil, grease, paper and lint particles, and other airborne contaminants. Work areas should be lighted to at least 100 ft candles. The relative humidity and temperature maintained at in the work area should be below 50% and 23.9°C ± 28 (75°F ± 5) for good working conditions. Where critical fits, such as metal-to-metal seats are involved, or the disassembly or buildup of high pressure oxygen components is performed, the work should be done on a laminar flow clean bench meeting the requirements of USAF Technical order 00-25-203.

4.1 Ventilation:

Forced filtered air is preferred. Filtration should remove all airborne particles over 100 μm in size. Filtration or equivalent ventilation may be used, provided airborne particle size is limited to less than 100 μm size. The concentration of airborne particles should be held to the minimum possible.

NOTE: A high concentration of 10 μm airborne particles can cause more problems to components than will a low concentration of 100 μm particles.

4.2 Work Benches:

Work benches shall be covered with easily cleaned surfaces, such as synthetic rubber, vinyl linoleum, formica, or stainless steel.

4.3 Walls and Ceiling:

Walls and ceiling shall be covered with washable vinyl or painted with epoxy, latex paint, or polyurethane-based paints.

4.4 Floors:

Floors shall be nondusting. Covering may be vinyl linoleum or polyurethane paint.

4.5 Storage Areas:

Storage areas shall have easily cleaned surfaces.

4.6 Cleaning:

Work area, benches, floors, and storage areas shall be vacuum cleaned daily. Airborne particle size shall be checked with standard test equipment (Gelleman or equivalent) often enough to prove the airborne particle size in the general work area is less than 100 μm .

4.7 Tools and Solvent Storage:

Tools used for handling oxygen components should be kept in a clean, oil free condition at all times. Solvents, cleaners, or other equipment not related to the immediate work effort should be kept away from the work area.