



• *HIGH PRESSURE OXYGEN* •

All gases under pressure are potential safety hazards in the form of stored energy. If a pressurized gas is not properly controlled, or used with equipment not designed for the gas or pressures encountered, accidents resulting in severe injury or death may occur. This is especially true in the case of oxygen.

Oxygen by itself is a non-flammable oxidizing gas, however oxygen vigorously supports combustion. As a result, almost all materials are combustible and will burn more actively and at higher temperatures in the presence of pure oxygen. Some materials which do not burn in air will burn readily in oxygen enriched atmospheres, other some materials may spontaneously combust in an oxygen rich environment, and if the concentration of oxygen is sufficiently high, the combustion of these materials may take the form of a violent explosion.

• *CONTAMINATION IN OXYGEN SYSTEMS* •

Contaminants in oxygen systems are potential fire or explosion hazards. When a gas is compressed it releases energy in the form of heat. When the gas is compressed quickly inside a closed system such as a container or piping, temperatures inside the system can rise sharply. In an oxygen system, this rise in temperature can be high enough to cause explosive ignition of contaminants such as oil, grease, solvents and materials such as dust, lint, metal chips and many organic materials.

Oxygen flowing at high speed through valves and piping systems can also propel contaminants with such force that friction or impact between particles can raise their temperature to the ignition point. The ignition of these particles may be enough to cause heavier metal sections to ignite and cause a major accident.

• *MOISTURE IN OXYGEN SYSTEMS* •

The presence of moisture in an oxygen system with valves located in an unheated part of the aircraft may cause the valves to freeze, rendering the system inoperative. Moisture may also cause internal cylinder corrosion, which in turn can lead to particulate contamination, be sufficient cause for condemning the cylinder.

In order to help prevent moisture contamination, aircraft oxygen systems should only be charged with Aviators Breathing Oxygen that meets the requirements of MIL-PRF-27210 or SAE AS1065.

• *MINIMUM POSITIVE PRESSURE* •

A cylinder that has been fully depleted may allow the ingress of moisture and/or contaminants so oxygen cylinders should be maintained at a positive pressure at all times. Theoretically, any pressure differential is sufficient to prevent contamination, but cylinders that have been depleted to zero PSI must be internally inspected and purged in accordance with MIL-STD-1395 or SAE-AS13591 prior to refill. The cylinder may also require abrasive blasting of the cylinder interior and replacement of the protective phosphate coating if corrosion is detected.

• *SAFETY PRECAUTIONS* •

Because oxygen strongly supports combustion and fire, and because of the high pressures involved, there are always some hazards associated with the handling of oxygen equipment. These hazards can be reduced with proper equipment handling, including during installation and maintenance, and by taking the proper precautions and providing appropriate instructions to all personnel involved. The following safety precautions should always be followed:

- Always HANDLE WITH CARE! Do not drop pressurized components!
- Allow only authorized, approved personnel to service, repair or overhaul your oxygen equipment.
- Follow the manufacturer's instructions for operation, maintenance and overhaul procedures.
- Never use oil or grease in, on or around oxygen equipment.
- Do not improvise or substitute parts or materials on oxygen systems.
- Do not expose oxygen systems to high temperatures, and keep away from all combustibles.
- Do not smoke in an aircraft when an oxygen system is in use.
- Use only "Aviators Breathing Oxygen" when refilling an oxygen system.
- Always open oxygen valves slowly.
- Ensure aircraft is well grounded to prevent electrostatic discharge when servicing oxygen system.
- Always do a preflight check of your oxygen system before takeoff. Check the following:
 - Oxygen pressure gauge.
 - Regulator operation (if possible).
 - Flow indicator (ensure oxygen is flowing).
 - All connections to ensure they are secure.
 - Masks and hoses for any signs of wear or deterioration.
 - For any other evidence of damage or misuse.