# Conditions under Which Oxygen Shall Be Used

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A. GENERAL / CHAPTER 14 - CONDITIONS UNDER WHICH OXYGEN SHALL BE USED

14. Conditions under Which Oxygen shall be Used

14.1 Definitions

First Aid Oxygen

First Aid Oxygen means the additional oxygen provided for the use of passengers, who do not satisfactorily recover following subjection to excessive cabin altitudes, during which they had been provided with supplemental oxygen.

*Note*: First Aid Oxygen is only required for pressurized aircraft operating above 25,000 ft where Cabin Crew Members are required.

Supplemental Oxygen / Pressurized Aircraft

Supplemental Oxygen Pressurized Aircraft means a supply of oxygen to the required number of occupants for the required flight time at the appropriate altitudes, following a cabin depressurization.

Supplemental Oxygen / Non-pressurized Aircraft

Supplemental Oxygen / Non-pressurized Aircraft means a supply of oxygen to be provided in unpressurized aircraft to the occupants whenever flight altitudes above 10,000 ft are used.

Crew Protective Breathing Equipment (PBE)

Crew Protective Breathing Equipment (PBE) is equipment that is used to protect the eyes, nose and mouth of each Flight Crew Member while on flight deck duty and for each Cabin Crew Member if required. The PBE shall allow Crew Members to continue to perform their duties even under smoke or toxic air conditions in the cabin or on the flight deck; the portable PBE equipment must allow active firefighting.

14.2 General

The amount of supplemental oxygen required shall be determined on the basis of cabin pressure altitude, flight duration and the assumption that a cabin pressurization failure will occur at the altitude or point of flight that is most critical from the standpoint of oxygen need, and that, after the failure, the aircraft will descend in accordance with emergency procedures specified in the AFM to a safe altitude for the route to be flown that will allow continued safe flight and landing. Following a cabin pressurization failure, the cabin pressure altitude shall be considered the same as the aircraft altitude, unless it is shown that no probable failure of the cabin or pressurization system will result in a cabin pressure altitude equal to the flight altitude.

Under these circumstances, the maximum cabin pressure altitude established for the type certification of the aircraft shall be used as a basis for determination of oxygen supply.
14.3 First Aid Oxygen

The amount of oxygen shall be calculated using an average flow rate of at least 3 liters Standard Temperature Pressure Dry (STPD) per minute/person for the entire flight after depressurization at cabin altitudes of more than 8000 ft for at least 2% of the passengers carried (but in no case for less than one person). The amount of first aid oxygen required for a particular operation shall be determined on the basis of cabin pressure altitudes and flight duration, consistent with the operating procedures established for each operation and route. The oxygen equipment provided shall be capable of generating a mass flow to each user of at least four liters per minute, STPD. Means may be provided to decrease the flow to not less than two liters per minute, STPD, at any altitude.

The amount of oxygen shall be calculated using an average flow rate of at least 3 liters Standard Temperature Pressure Dry (STPD) per minute/person and shall be sufficient for the remainder of the flight after depressurization when the cabin altitude exceeds 8000 ft but does not exceed 15,000 ft for at least 2% of the passengers carried (but in no case for less than one person).

There are 2 dispensing units on board of every ACA aircraft intending to operate above 25,000 ft. The amount of first aid oxygen required for a particular operation shall be determined on the basis of cabin pressure altitudes and flight duration, consistent with the operating procedures established for each operation and route.

14.4 Crew Protective Breathing Equipment (PBE)

The PBE (required for all pressurized aircraft and all unpressurized aircraft with MATOW above 5700 kg or a maximum seating capacity of more than 19) shall provide oxygen for a period of at least 15 minutes for each such PBE mask. When computing the total oxygen required for the non-portable equipment, then the supply for the supplemental oxygen system as required under OM, Chapter 1.12.

The portable PBE has a self-contained supply for 15 minutes.

On aircraft requiring a Flight Crew of more than one but no Cabin Crew Member, a portable PBE must be carded to protect the eyes, nose and mouth of one Flight Crew Member and to provide breathing gas for a period of not less than 15 minutes.

On aircraft requiring Cabin Crew Members, each required cabin crew station shall be provided with an installed PBE adjacent to the Crew Member duty station.

14.5 An Explanation of the Conditions under which Oxygen must be Provided and Used for Crew Members and Passengers

The following Oxygen Requirements apply to all Flight Crew, Cabin Crew Members and passengers shall be supplied with supplemental oxygen in accordance with the Table below.
14.5.1 A flight to be operated at flight altitudes at which the atmospheric pressure in personnel compartments will be less than 700 hPa at altitude 10,000 ft shall not be commenced unless sufficient stored breathing oxygen is carried to supply:

a) all crew members and 10 per cent of the passengers for any period in excess of 30 minutes that the pressure in compartments occupied by them will be between 700 hPa and 620 hPa or at altitude between 10,000-13000 ft; and

b) the crew and passengers for any period that the atmospheric pressure in compartments occupied by them will be less than 620 hPa or at altitude above 13000 ft.

14.5.2 A flight to be operated with a pressurized aeroplane shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all the crew members and passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurization, for any period that the atmospheric pressure in any compartment occupied by them would be less than 700 hPa. In addition, when an aeroplane is operated at flight altitudes at which the atmospheric pressure is less than 376 hPa or at altitude or which, if operated at flight altitudes at which the atmospheric pressure is more than 376 hPa and cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa, there shall be no less than a 10-minute supply for the occupants of the passenger compartment.

Note 1: The oxygen supply provided takes into account the cabin pressure altitude and descent profile for the routes concerned.

Note 2: The minimum oxygen supply available shall provide for a constant rate of descent from the aeroplane’s maximum certificated operating altitude to 10 000 ft, 3050 m in 10 minutes and followed by 20 minutes at 10 000 ft, 3050 m.

Note 3: The minimum oxygen supply available shall provide for a constant rate of descent from the aeroplane’s maximum certificated operating altitude to 10 000 ft, 3050 m in 10 minutes and followed by 110 minutes at 10 000 ft, 3050 m. The supplemental oxygen is capable of storing and dispensing oxygen required in may be included in determining the calculated supply that is required.

Note 4: The minimum oxygen supply available shall provide for a constant rate of descent from the aeroplane’s maximum certificated operating altitude to 15 000 ft, 4575 m in 10 minutes.

Note 5: For the purpose of the above table, both passengers and infants are included.

14.6 OXYGEN SUPPLY (Hawker 850 XP)

The passenger oxygen system is not capable of providing an adequate oxygen for a prolonged unpressurized flight at the maximum operating altitude. The highest recommended cabin altitude to which passengers should expose for extended flight is 25,000 feet. Passenger safety is not assured for prolonged unpressurized flight above 34,000 feet since pressure breathing masks are not provided.
If a descent becomes necessary in the event of cabin decompression, allowances should be made for the change in range performance at the lower altitude.

Cockpit masks are assumed to be on diluter demand at 30,000 feet and below, 100% oxygen from 30,000 to 35,000 feet and pressure breathing above 35,000 feet.

### 14.7 OXYGEN DURATION (Hawker 850XP)

A bottle of 1,850 PSIG at 15 °C is fully charged (100% Capacity). Read duration directly from the oxygen the oxygen duration table.

1. Read the oxygen pressure from the gauge
2. Determine the OAT (assume OAT to be equal to BOTTLE TEMPERATURE)
3. Determine the percent of usable capacity from the following graph (e.g., 1100 PSIG at 0 °C - 57%)

4. Compute the oxygen duration in minutes from the table by multiplying the full bottle duration by the percent of usable capacity, e.g.,
   a. Pilot and copilot plus six passengers
   b. Cylinder volume = 77 cubic feet
   c. Duration with full bottle (30,000 feet - 61 minutes)
   d. Duration with 57% capacity = 57x61-35 minutes
## Conditions Under Which Oxygen Shall Be Used

### Oxygen Duration (Minutes)

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<thead>
<tr>
<th>No. of User</th>
<th>10,000</th>
<th>15,000</th>
<th>20,000</th>
<th>25,000</th>
<th>30,000</th>
<th>35,000</th>
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<td>292</td>
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*Base on 100% charge (1850 PSIG) (1903 usable liters - NTPD) (crew masks on normal)*