



AEROSPACE RECOMMENDED PRACTICE

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GLOSSARY OF TECHNICAL AND PHYSIOLOGICAL TERMS RELATED TO AEROSPACE OXYGEN SYSTEMS

Ø a	Arterial symbol, used to designate source of blood gas, or other components of arterial blood, i.e., PaO_2 , partial pressure of arterial oxygen tension; PaCO_2 , arterial CO_2 tension, etc.
Ø A	Alveolar symbol, used to designate alveolar gas tensions, i.e., PAO_2 , alveolar O_2 tension; PAO_2 , alveolar oxygen tension, etc.
ABSOLUTE PRESSURE	See "Pressure, Absolute".
Ø ACAPNIA	The complete absence of carbon dioxide (usually in the blood); term commonly used incorrectly for hypocapnia.
ACAPNIC	Suffering from acapnia.
Ø ACIDOSIS, RESPIRATORY	Resulting from an increase of the carbonic acid of blood relative to the bicarbonate fraction with resultant decrease of pH; this occurs whenever elimination of carbon dioxide through pulmonary ventilation is impaired, as in respiratory obstruction, paralysis, pulmonary fibrosis, or other diffusion impairment.
ADAPTER	A mechanical means for connecting some part of one oxygen system to another different oxygen system.
ADIABATIC	Describes a process in which an energy change is accomplished on or by a fluid without heat transfer to or from the surroundings. See "Compression, Adiabatic".
AEROEMBOLISM	A condition wherein gases (mostly nitrogen) appear in the circulatory system and are transported in gaseous form. Related to relative decreases in the ambient pressure. These bubbles tend to lodge in smaller vessels impairing blood flow and tissue nutrition. Often coexistent with but not necessarily identical to bends.
Ø AEROSOL	A fine suspension of liquid or solid particles (usually 0.3 to 8 μm) in an atmosphere of gas.
AIR, CABIN	(1) Air flowing into a cabin. (2) Air in the cabin proper - the condition of cabin air is normally determined at the point where the air leaves the cabin.

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AIR CONTENT, ALVEOLAR, DRY	See "Gases, Respiratory".
AIR CONTENT, ATMOSPHERIC, DRY	See "Gases, Respiratory".
AIR CONTENT, EXPIRED, DRY	See "Gases, Respiratory".
AIR, BLEED	Air bled from the compressor of a gas turbine engine.
AIR, COOLING	A stream of air used as a heat sink.
AIR, RECIRCULATED	Air in enclosed spaces or equipment cooling systems which is recirculated by fans or blowers.
Ø AIR, STANDARD SEA LEVEL	Air at 15°C (59°F) and at a dry pressure of 101.3 kPa (29.92 inches Hg) absolute.
AIR, REGENERATED	Air which has been regenerated by removing excess carbon dioxide, water vapor, odor, or other contaminants and, by adding oxygen, thereby making it suitable for respiration.
AIRWAY	(1) The path which air travels from the atmosphere to the alveoli or small air sacs in the lung. (2) Any of several devices used in securing or maintaining an unobstructed respiratory passage.
ALKALOSIS, RESPIRATORY	A decrease of the carbonic acid fraction of blood relative to the bicarbonate fraction with resultant increase in pH; this occurs as a result of excessive elimination of carbon dioxide, as in hyperventilation. Also called "Hypocapnia".
ALTITUDE, DENSITY	The altitude corresponding to a given density in a standard atmosphere.
ALTITUDE, EQUIVALENT OR CABIN	I. C. A. O. (International Civil Aviation Organization) standard altitude at which atmospheric pressure is equal to the cabin pressure.
ALTITUDE, PRESSURE	The altitude corresponding to a given pressure in I. C. A. O. standard atmosphere.
ALTITUDE, STANDARD	The altitude corresponding to the temperature and pressure as defined for an I. C. A. O. Day and as tabulated in NACA-TN-3182.
ALVEOLAR AIR	Air in the terminal lung sacs, or alveoli and alveolar ducts.
Ø ALVEOLAR DUCT	A portion of the terminal air passages of the lung from which air sacs (alveoli) arise.
Ø ALVEOLAR MEMBRANE	Thin layer of tissue which partitions the air in the alveoli from capillary blood, and through which gas exchange occurs between blood and alveolar air.

ALVEOLAR VENTILATION

That air which enters the alveoli. In principle, tidal volume minus the physiological dead space times the respiratory rate.

Ø ALVEOLUS (plural ALVEOLI)

See Pulmonary Alveolus

Ø AMBIENT

Surrounding, or prevailing, as "ambient temperature".

Ø ANEMIA

A quantitative or qualitative deficiency of the blood. This may be a reduction in the total number of red blood cells, Hemoglobinemia, which is a reduction of the hemoglobin content within each cell, or both. The result is a decrease in the oxygen-carrying capacity of the blood. Anemia is marked by paleness of the skin and mucous membranes, loss of energy, heart palpitation and murmurs.

Ø ANEROID

A sealed flexible chamber containing little or no air which causes it to expand when exposed to a reduced ambient pressure or contract when subjected to increased ambient pressure. See "Control, Barometric".

Ø ANOXEMIA

A condition of absolute lack of oxygen, as opposed to hypoxemia or hypoxia which refers to deficiency or lowered oxygen content.

ANOXIA

Absence of oxygen; a condition incompatible with many forms of life. Failure of tissue either to receive or to utilize an adequate amount of oxygen; former term, now more properly "Hypoxia".

APNEA

See "Respiration, Types of".

Ø ARRHYTHMIA

Absence of rhythm, applied especially to any variation from the normal rhythm of the heart beat.

Ø ARTERIAL BLOOD

Usually refers to oxygenated (bright red) blood in the conducting and distributing arteries of the systemic circulation. (Blood in the pulmonary artery, by contrast, is dark (purplish) because of its low oxygen content prior to oxygenation in the lung capillary vascular bed.) The pulmonary artery conducts venous blood from the superior and inferior vena cava vein through the right heart to the lung.

Ø ARTERY

A vessel conducting blood from the heart. Conducting and distributing arteries are those which deliver oxygenated blood to all organs. The pulmonary artery conveys venous blood from the heart to the alveolar ducts and alveoli. Bronchial and tracheal arteries supply oxygenated arterial blood to the non respiratory conducting lung structures.

Ø ASPHYXIA

Suffocation from lack of available or usable oxygen plus retention of carbon dioxide in vital tissues. The retention of carbon dioxide distinguishes asphyxia from hypoxia which is merely a diminished amount of oxygen supply. Cardiac muscle tolerates asphyxia poorly as compared to hypoxia.

Ø ASPIRATION

- (1) Removal of accumulated mucus and foreign bodies from airway by suction.
- (2) To draw by suction into the airway, vomitus, food, secretions or excretions. Results in aspiration pneumonitis.
- (3) The act of breathing or drawing in.

ASTHMA

Recurrent attacks of difficult breathing, with dyspnea (shortness of breath), cough, wheezing, and a sense of constriction of the chest.

ATELECTASIS

Partial or complete collapse, or imperfect expansion of the air sacs of the lungs; may include entire lobes or entire lung fields.

ATMOSPHERE

- (1) A mixture of gases surrounding the earth.
- (2) A mixture of gases surrounding an object or a person.
- (3) In expressing pressure of compressed gases, 1 atmosphere is assumed to be 14.7 psia.

Ø ATMOSPHERE, STANDARD

Atmosphere in which: (1) the air is a dry perfect gas; (2) the temperature at sea level is 15° Celsius (59° Fahrenheit); (3) the pressure at sea level is 101.3 kPa (29.92 inches Hg) (760 mm Hg); (4) the temperature gradient from sea level to the altitude at which the temperature is -56.5° C (-69.7° F) is -0.006499° C/meter (-0.003566° F per foot) and zero above that altitude; and (5) the density at sea level under the conditions described in subparagraphs (1) thru (4) is 1.225 kg/m³ (0.002377 lb. sec.²/ft.⁴) (.002377 slugs per cu. ft.).

ATMOSPHERIC PRESSURE

See "Pressure, Atmospheric".

ATOMIZER

Device to reduce a liquid or solid to small droplets, in the form of a spray. See "Nebulizer".

Ø A T P D

Ambient Temperature and Pressure, Dry.

A T P S

Ambient Temperature and Pressure, Saturated with water vapor.

AUTOMIX

A valve operated by barometric pressure which regulates the mixture of oxygen with ambient air to attain a percentage of oxygen according to altitude.

AVERAGE LUNG VOLUME

Average volume of gas in lung during respiration (residual volume plus expiratory reserve plus 1/2 tidal volume). See "Lung".

BAG, ECONOMIZER

A bag (connected to a mask) to which oxygen is admitted continuously at a fixed rate of flow, and which during expiration is isolated from the mask by a check valve so that oxygen delivered to the bag during expiration is available for the next inspiration, thereby reducing the peak demand on the oxygen system.

BAG, REBREATHING

A bag connected through an open passage to a mask, so that oxygen delivered to the bag at a continuous fixed rate of flow becomes mixed with a portion of the expired gas, thereby providing a large volume of oxygen-enriched gas for the next inspiration, thus reducing the peak demand on the oxygen system and reducing the oxygen consumption by rebreathing a portion of each expiration.

BAROMETRIC CONTROL

See "Control, Barometric".

BENDS

A condition of pain in the joints and deep or superficial tissues caused by the appearance of gas bubbles as a result of the relative decrease in ambient pressure. Identical with decompression sickness. Also see "Aeroembolism" and "Dysbarism".

Ø BLINKER

A type of oxygen flow indicator having a shutter which opens and closes during breathing.

Ø BOTTLE, OXYGEN

See "Cylinder, Oxygen".

Ø BRADYCARDIA

Slowness of the heart manifested by a pulse rate usually less than 60 per minute. Also slowing of the heart rate below normal.

BRADYPNEA

See "Respiration, Types of".

BREATH

The air inhaled and exhaled during respiration.

BREATHING

The cyclic inflow and exit of air from the lungs through the air conducting components of the respiratory tract.

BRONCHI

The two primary divisions of the trachea, or windpipe. (Singular, bronchus.)

Ø BRONCHIUM (plural BRONCHIA)

One of the subdivisions of a bronchus, smaller than the bronchus and larger than the bronchioles.

Ø BRONCHIECTASIS

Abnormal and chronic dilatation and infection of bronchial tubes and terminal air sacs and passage. Marked by fetid breath and paroxysmal coughing with the expectoration of mucopurulent matter.

Ø BRONCHIOLE

A minute, thin walled branch of a bronchus, especially one that terminates in one or more alveoli and alveolar ducts.

Ø BRONCHIOLITIS	Inflammation of the bronchioles, bronchopneumonia.
Ø BRONCHITIS	Inflammation and edema of the bronchial tubes leading to airway obstruction deep in the lung.
Ø BRONCHOCONSTRICTOR	A medicament or agent which narrows the air passages of the lungs.
Ø BRONCHODILATOR	A medicament or agent which dilates the air passages of the lungs.
Ø BRONCHOSPASM	Spasmodic narrowing of the lumen of a bronchus associated with edema of air passages and air trapping.
Ø BTPD	Body Temperature (37° C or 98.6° F), Ambient Pressure, Dry.
Ø BTPS	Body Temperature (37° C or 98.6° F), Ambient Pressure, Saturated with water vapor ($p_{H_2O} = 47 \text{ mm Hg} = 6.3 \text{ kPa}$).
CABIN, NONPRESSURIZED	An airplane cabin which is not designed or equipped for pressurizing and which will, therefore, have a cabin pressure equal to that of the surrounding atmosphere.
CABIN, PRESSURIZED	An airplane cabin which is constructed, sealed, and equipped with an auxiliary system to maintain a pressure within the cabin greater than that of the surrounding atmosphere.
CANNULA, NASAL	A tube (or pair of tubes) designed to be inserted into one or both nostrils, for the administration of oxygen or other gases, or for sampling of respiratory gases.
Ø CAPILLARY	A minute (6 to 8 microns (μm) diameter) thin-walled blood vessel, smallest of the blood-transport system. Capillaries constitute the interchange point between the circulatory system and the tissues, and connect the arterial system with the venous system.
CAPILLARY TUBE	(1) A small diameter tube inserted in a pneumatic or hydraulic system to produce a desired pressure drop. (2) A small diameter tube connecting a thermostatic or pilot valve with a bellows or diaphragm in a control device.
Ø CARBON DIOXIDE (CO_2)	An odorless, colorless gas which neither burns nor supports combustion. It is one of the chief products of combustion of carbon-containing substances. It is a waste end product of the living metabolic processes in the body. It is excreted in exhaled air. It diffuses from the blood across the alveolar membrane into the respiratory air as a result of a gradient in partial pressures.

CARBON MONOXIDE (CO)	A colorless, odorless, toxic gas resulting from combustion of carbonaceous compounds in an insufficient supply of oxygen.
Ø CHEMICAL OXYGEN GENERATOR	A device containing chemically combined oxygen which, when properly activated (generally by heating from an internal exothermic chemical reaction) will produce a supply of pure gaseous oxygen at a rate and in a quantity suitable for breathing.
CHEYNE-STOKES RESPIRATION	See "Respiration, Types of".
CLOSED CIRCUIT SYSTEM	See "Rebreather System".
COMPLEMENTAL AIR	See "Reserve, Inspiratory".
Ø COMPLIANCE	A measure of the elastic properties of the lung, airway, thorax and other compliance-contributing components alone or together, in volume change per unit pressure change, usually liters per centimeter of water (L/cm H ₂ O) or, in SI units, cubic decimetres per 98 Pascals (dm ³ /98 Pa).
COMPRESSION, ADIABATIC	Compression of a gas or mixture of gases without transmission of heat to or from it.
COMPRESSION, ISOTHERMAL	Compression of a gas or mixture of gases with subtraction of sufficient heat to maintain a constant temperature.
COMPRESSOR	A device in which work is done on a fluid (liquid or gas) to raise its total pressure.
COMPRESSOR, AXIAL	A compressor which inducts and delivers a fluid (liquid or gas) axially by one or more rotating elements, compressing the fluid.
COMPRESSOR, CABIN	A compressor which compresses and delivers air to a pressurized cabin.
COMPRESSOR, CENTRIFUGAL	A compressor which inducts a fluid (liquid or gas) axially, delivers it radially outward relative to the rotating impeller, and compresses the fluid.
Ø CONCENTRATION	The amount of a given constituent present in a unit volume. May be expressed as a ratio, as a percentage, in parts per million or in milligrams per liter (mg/dm ³).
Ø CONDITIONER	A device by which the inspired air, in passing through it, is warmed, purified, humidified, or medicated.

CONDITIONING, AIR

The simultaneous control of all, or at least the first three, of the following factors affecting both the physical and chemical conditions of the atmosphere within a structure: temperature; humidity; motion; distribution; pressure; dust; and bacteria.

Ø CONFORMANCE

See "ELASTANCE".

Ø CONTAINER

See "Cylinder, Oxygen".

CONTROL, BAROMETRIC

A method of control which depends on the barometric pressure of the atmosphere. See "Aneroid".

CONTROL, DIFFERENTIAL PRESSURE

A method of control which limits the maximum pressure differential between cabin pressure and atmospheric pressure and maintains this differential at all altitudes above those of the isobaric control. When operating, the differential control always overrides the isobaric control.

CONTROL, ISOBARIC

A method of control which maintains essentially constant cabin air pressure.

CONTROL, MANUAL

A control device regulated by hand.

COR PULMONALE

Dilation of the right side of the heart, secondary to an obstructing pulmonary disease, or to obstruction of the pulmonary artery.

CORONARY OCCLUSION

Shutting or closing off of one of the arteries of the heart. Common cause of "heart attack".

COSTAL BREATHING

See "Respiration, Types of".

COUPLING, AUTOMATIC OUTLET

An oxygen connection which when disconnected automatically closes a valve to prevent loss of oxygen, and reopens when reconnected.

CREWMEMBER

A person assigned to perform duty in an aircraft during flight time.

CRITICAL POINT

The critical point of a fluid is that point at which liquid and vapor have identical properties; critical temperature, critical pressure and critical volume are terms given to temperature, pressure and volume at the critical point. Above the critical temperature, gas cannot be liquefied by pressure alone. Critical pressure is saturation pressure corresponding to critical temperature.

Ø CYANOSIS

A bluish-gray tinge in the color of mucous membranes and skin (usually first noticeable in the lips, ear lobes, and nail beds) associated with blood oxygen deficiency. Usually caused by the presence of excessive amounts (5 g or more per 100 cc blood) of reduced hemoglobin in the capillaries. Seldom recognized in subjects with less than 10 g hemoglobin per 100 ml blood.