Aceti-Oxigeno, S.A.
FABRICANTES DE GASES PARA USO MÉDICO, ALIMENTICIO E INDUSTRIALES

MATERIAL SAFETY DATA SHEET

(MSDS MATERIAL SAFETY DATA SHEET)

Annex 6

AIR

1. Product and company identification

1.1	Product name:	Compressed air
1.2	Common chemical name:	Air
1.3	IUPAC chemical name:	Air
1.4	Chemical family:	Family of natural mixtures
1.5	Condensed formula:	Does not have any
1.6	Synonyms:	Medical air, breathing air, compressed air
1.7	Company name:	Aceti-Oxígeno, S.A.
1.8	Company address:	Panama Mañanitas-Industrial Zone
1.9	Telephone:	Tel. 321-8888
1.10	Emergency Telephone:	103 Fire Brigade
1.11	REVISION DATE:	June 20. of 2022, rev. 1, valid until: June 20, 2027
1.12	Use:	Medical, industrial and analytical

2. Composition or Information on ingredients

2.1	Ingredient name:	Air
2.2	CAS[1] Number:	132259-10-0
2.3	Percentage:	100%
2.4	OSHA PEL-TWA[2]:	None
2.5	ACGIH TLV[3]:	None
2.6	[LD_{50}]:	None
2.7	[LC_{50}]:	None

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[1] Chemical Abstracts Service (International Material Identification Number according to the Chemical Abstracts Service)

[2] Occupational Safety and Health Administration. Permissible Exposure Limits. Time Weighted Average (Occupational Safety and Hygiene Administration. Permissible Exposure Limits. Time weighted average exposure)

[3] American Conference of Governmental Industrial Hygienists. Threshold Limit Value (North American Conference of Governmental Industrial Public Health. Threshold Limit Value)

3. Risk identification

3.1 Considerations and hazards during emergencies

3.1.1 High pressure gas

3.1.2 It can stimulate and accelerate combustion

3.2 Information on potential health effects

3.2.1 Exposure routes

3.2.1.1 Inhalation: At atmospheric pressure, air has no adverse effects on health. For high pressure exposures see Section 11, Toxicological Information.

3.2.1.2 Contact with eyes: No risk

3.2.1.3 Skin contact: No risk
3.2.1.4 Skin absorption: No risk
3.2.1.5 Ingestion: No risk
3.2.2 Chronic effects: No chronic effects have been established from the use of compressed air.
3.2.3 Medical conditions aggravated by overexposure: None
3.2.4 Other effects of overexposure: None
3.2.5 Carcinogenicity: Air is not listed by NTP[4], OSHA or IARC[5].

[4] National Toxicology Program
[5] International Agency for Research on Cancer

4. First aid

4.1 Inhalation: No first aid required.

4.2 Contact with eyes: No first aid required.

4.3 Skin contact: No first aid required.

4.4 Ingestion: No first aid required

4.5 Remarks to the doctor: None

5. Measures in case of fire

5.1 Ignition point: Not applicable because it is a gas.

5.2 Auto ignition: Not applicable

5.3 Flammable limits in air, volume by volume:
5.3.1 Lower: Not applicable
5.3.2 Superior: Not applicable

5.4 Extinguishing media: Air is not flammable, but it stimulates combustion. Use appropriate extinguishing media for the surrounding flammable materials.

5.5 Special instructions to firefighters: Evacuate all personnel from the danger area. If possible, cut off the flow of air that is fueling the fire. Immediately cool containers with water spray from as far away as possible. When containers cool, remove from fire area if no other hazard is associated.

5.6 Unusual fire and explosion hazards: High pressure compressed air can accelerate the combustion of other materials. On exposure to intense heat or flame, cylinders will rapidly vent and/or rupture violently. Most cylinders are designed to vent their contents when exposed to high temperatures. Pressure in a container can rise due to heat, which can cause it to rupture if pressure relief devices fail to function.

5.7 Hazardous combustion products: None

5.8 Sensitivity to static discharge: None

5.9 Sensitivity to mechanical impact: None

6. Measures in case of accidental release

6.1 Steps to be taken if material is released or spilled:
6.1.1 Close connection to air source if possible.
6.1.2 If there is a leak from the cylinder or valve, notify Aceti-Oxígeno, S.A. immediately.

7. Handling and storage

7.1 Precautions for storage
7.1.1 Store and use with adequate ventilation

7.1.2 Cylinders of air and other oxidizing gases must be separated from cylinders of combustible gases by a minimum distance of 20 feet (6 meters) or by a barrier of non-combustible material at least 5 feet high (1.52 meters) that has a fire resistance rate of at least half an hour.

7.1.3 Cylinders must be stored upright with the valve protection cap in place, properly secured to prevent falling or being knocked over.

7.1.4 Protect cylinders from any physical damage. Do not drag, roll, slide or drop them.

7.1.5 Do not allow storage temperature to exceed 125ºF (52ºC).

7.1.6 Full and empty cylinders must be separated.

7.1.7 Use a FIFO (first-in, first-out) inventory system to prevent full cylinders from being stored for long periods of time.

7.2 Precautions to be taken into account for handling.

7.2.1 Use a handcart to move cylinders.

7.2.2 Never attempt to lift a cylinder by the protective valve cap.

7.2.3 Keep the cylinders and their valves free of oil and grease.

7.2.4 For use, open the valve slowly.

7.2.5 Any difficulty in the operation of the valve implies discontinuing its use and contacting Aceti-Oxígeno, S.A.

7.2.6 Never insert an object (tool such as wrench, screwdriver, etc.) into the openings of the valve protection cap, as it may be damaged and generate air leakage.

7.2.7 Do not hit the valve protection cap with a hammer. Use an adjustable strap wrench to remove rusted or overtightened plugs.

7.2.8 Never bring an electric arc near a compressed gas cylinder or make it part of an electrical circuit.

7.2.9 For additional precautions in the use of air, see Section 16. Other Information.

8. Exposure control and personal protection

8.1 Infrastructure controls

8.1.1 Ventilation: Not required.

8.2 Respiratory protection

8.2.1 General routine use: Not required

8.2.2 Use in emergencies: Not required.

8.3 Protective gloves: It is recommended to wear work gloves when handling cylinders. If used, gloves must be clean and free of oil and grease.

8.4 Eye protection: The use of safety glasses is recommended for handling the cylinders.

8.5 Other protective equipment: The use of safety footwear is recommended for handling cylinders.

9. Physical and chemical properties

9.1 Molecular Weight: 28.9750 g/mol (as a weighted average of the molecular weight of its main components)

9.2 Boiling point (1 atmospheric pressure): -317.8 ºF (-194.3 ºC)

9.3 Specific Gravity (Air = 1) at 70ºF (21.1ºC) and 1 atmospheric pressure: 1,000

9.4 Melting point (1 atmospheric pressure): -357.2 ºF (-216.2 ºC)

9.5 Vapor pressure at 20 ºC: Not applicable

9.6 Gas density at 70ºF (21.1ºC) and 1 atmospheric pressure: 0.07493 lb/cf or 1.2000 Kg/m^3

9.7 Evaporation rate (Butyl Acetate = 1): Not applicable because it is a gas.

9.8 Solubility in water:

9.8.1 Vol/Vol at 32ºF (0ºC) and 1 atmospheric pressure: 0.0292

9.8.2 Vol/Vol at 60ºF (15.6ºC) and 1 atmospheric pressure: 1.1

9.9 Expansion Ratio: Not applicable

9.10 pH: Not applicable

9.11 Appearance, odor and condition: Colorless, odorless and tasteless gas at normal pressure and temperature.

9.12 Water/Oil Distribution Coefficient: Not applicable

9.13 *Odor threshold: Not applicable*

10. Stability and reactivity

10.1 Stability: Stable.

10.2 Conditions to avoid: None

10.3 Incompatibilities (Materials to avoid): None

10.4 Reactivity:
10.4.1 Hazardous decomposition products: None
10.4.2 Hazardous polymerization products: Will not occur.

11. Toxicological information

Air is non-toxic and is necessary to sustain life. Inhalation of air in hyper-pressurized environments can cause symptoms similar to overexposure to oxygen. These include tingling in the fingers, impaired coordination. Exposure to high pressure air environments may require the use of decompression equipment.

11.1 Ability to cause irritation: None

11.2 Sensitization to material: None

11.3 Effects on the reproductive system: None

11.4 Teratogenicity: None

11.5 Mutagenicity: None

11.6 Synergistic Materials: None

12. Ecological information

No adverse or negative ecological impacts are expected. The air does not contain Class I or Class II chemicals, which deplete the ozone layer (40 CFR [6] Part 82). Air is not listed as a marine pollutant by DOT[7] (49 CFR Part 171)

[6] Code of Federal Regulations (United States Code of Federal Regulations)
[7] Department of Transportation of the United States of America

13. Disposal considerations

13.1 Waste disposal method: Do not attempt to dispose of residual or unused amounts. Return the cylinder to the supplier.

13.2 Discarded cylinders must be returned to the supplier for proper and safe disposal.

13.3 For emergency disposal, secure cylinder and slowly discharge gas to atmosphere.

14. Transport information

14.1 DOT/IMO Shipping Name: Compressed Air.

14.2 Hazard Classification: 2.2 (Non-flammable Gas)

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14.3 Identification number: UN 1002

14.4 Product identification number: 1002

14.5 Product reportable quantity: Not applicable

14.6 Shipping labels: Non-flammable gas

14.7 Placard: Non-flammable gas

14.8 Special shipping information: Cylinders must be transported in a secure upright position, in a well-ventilated vehicle. The transport of compressed gases in automobiles or closed body vehicles can present great safety risks and should not be recommended or encouraged.

15. Related regulations

The following information is related to United States regulatory requirements potentially applicable to this product in Panama. Users of this product are responsible for complying with their local or general regulatory requirements.

15.1 United States Federal Regulations

15.1.1 EPA - Environmental Protection Agency

15.1.1.1 CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (40 CFR Parts 117 and 302). Reportable Quantity RQ: Not applicable

15.1.1.2 SARA: Superfund Amendment and Reauthorization Act

Section 302/304: Requires emergency planning based on Threshold Planning Quantities (TPQ) and release reporting based on Reportable Quantities (RQ) of EPA-scheduled substances as extremely hazardous (40 CFR Part 355)

Extremely Hazardous Substance: Not Applicable
Planning Threshold Quantity: Not applicable

Section 311/312: Requires the submission of a Material Safety Data Sheet (MSDS) and a chemical inventory report with identification of the risk classes defined by the EPA (40 CFR Part 370). The hazard classes for this product are:

Immediate:	No
Late:	No
Pressure:	Yes
Reactivity:	No
Fire:	No

Section 313: Requires submission of annual toxic chemical release reports listed in 40 CFR Part 372. Air is not required to report under this Section.

15.1.2 40 CFR Part 68: Risk Management for Chemical Accidental Release: Requires the development and implementation of risk management programs in manufacturing facilities, use, storage, or any other Controlled substance handled in amounts exceeding specified thresholds. Air is listed as a regulated substance.

15.1.3 TSCA Toxic Substance Control Act: Air is listed on the inventory of controlled products by TSCA.

15.2 OSHA Occupational Safety and Health Administration

15.2.1 29 CFR 1910.119: Process Safety Management of Highly Hazardous Chemicals: Requires facilities to develop Process Safety Management based on Threshold Quantities (TQ) of products high-risk chemicals, such as those listed in Appendix A. Air is not listed in Appendix A as a high-risk chemical.

15.3 FDA (Food and Drug Administration):

Air USP (United Stated Pharmacopea) is regulated by the FDA as a prescription drug.

16. Additional information

16.1 Special precautions: Use piping and equipment properly designed to withstand working pressures. Use a check valve or other cylinder protection device to prevent and avoid reverse flow.

Shipping compressed gas cylinders that have been filled without the consent of the cylinder owner is a violation of US federal law [49CFR Part 173.301(b)].

16.2 Mixtures: When two or more gases or liquefied products are mixed, their properties can combine to create additional unexpected hazards. Obtain and evaluate the safety information for each component before manufacturing the mixture. Seek advice from an industrial health worker or other qualified person, when carrying out the safety evaluation of the final product. Remember that gases and liquids have properties that can cause severe harm or death.

16.3 Other data:

16.3.1 Atmospheric air that is packaged generally compressed is composed of the following gases:

Nitrogen	78%
Oxygen	21%
Argon	0.9%

Compressed air can be produced synthetically, mixing 79% nitrogen and 21% oxygen.

16.3.2 NFPA Valuation

Health	0
Flammability	0
Instability	0
Special	0

16.3.3 HMIS Valuation (Hazardous Materials Identification Systems)

Health	0
Flammability	0
Reactivity	0

Classification of the chemical substance according to the SGA:

Physical hazards: Gases under pressure – Compressed gas.

Health Hazards: N/A.

Environmental Hazards: N/A.

Elements for the communication and signalization of hazards:

Word of warning: Attention.
Hazard statements:
H280: Contains gas under pressure; may explode if heated.

Precautionary advice:
Prevention: N/A.
Answer: N/A.
Storage:
P410+P403: Protect from sunlight. Store in a well-ventilated place.
Elimination: N/A.
Other hazards:
Containers may explode when heated.
Ruptured cylinders can be projected.

Pictogram/ Hazard symbol:

16.4 Standard valve connection for the United States and Canada

16.4.1 Coiled: Standard CGA 346 (or CGA 590 as an alternate for industrial air) for cylinders filled between 0-3000 psig, Standard CGA 347 for cylinders filled between 3001 and 5500 psig, and Standard CGA 702 for cylinders filled between 5501 and 7500 psig. For limited use standard connections see ANSI/CGA V-1, Compressed Gas Association Standard for Compressed Gas Cylinder Valve Outlet and Inlet Connections.
For Panama the standard is CGA 346.

16.4.2 Indexed Pin Yoke: CGA Standard 950 (for medical purposes)

16.4.3 Ultra high integrity: Not applicable

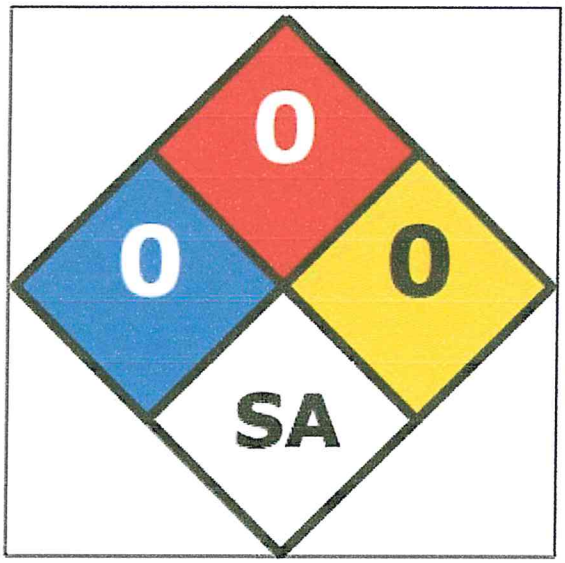
Use the proper CGA connection. DO NOT USE ADAPTERS.

More detailed information on air can be found in the following documents published by the Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Phone (703) 412-0900:

G-7	Compressed Air for Human Respiration
G-7.1	American National Standard Commodity Specifications for Air
P-1	Safe Handling of Compressed Gases in Containers
AV-1	Safe Handling and Storage of Compressed Gases

Conversion Table

AIR 28.975 g/mol PE=-194.3 °C						
UNITS	WEIGHT		GAS VOLUME		LIQUID VOLUME	
	Pounds	Kilograms	SCF Gas	Nm³ Gas	Liquid gallons	Liquid liters
Pounds	**1.000**	0.454	13.399	0.352	0.138	0.524
Kilograms	2.205	**1.000**	29.531	0.776	0.305	1.155
SCF Gas	0.075	0.034	**1.000**	0.026	0.010	0.039
Nm³ Gas	2.852	1.293	38.040	**1.000**	0.391	1.480
Liquid gallons	7.378	3.347	97.922	2.573	**1.000**	3.785
Liquid liters	1.949	0.901	25.599	0.703	0.292	**1.000**



COMPATIBILITY WITH OTHER MATERIALS

Metals	
Bronze	Satisfactory
303 Stainless Steel	Satisfactory
316 Stainless Steel	Satisfactory
Aluminum	Satisfactory
Zinc	Satisfactory
Copper	Satisfactory
Monel-metal	Satisfactory
Plastics	
PCTFE	Satisfactory
Teflon	Satisfactory
Tefzel	Satisfactory
Kynar	Satisfactory
PVC	Satisfactory
Polycarbonate	Satisfactory

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Elastomers

Kalrez	Satisfactory
Viton	Satisfactory
Buna-N	Satisfactory
Neoprene	Satisfactory
Polyurethane	Satisfactory

Change control:

Revision 01:

- Added safety color code for NFPA and the global harmonized system.

- The format was modified to the standards and approved by the sister companies Infra and Productos del Aire.

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