

Non

allowed

# NOSB NATIONAL LIST FILE CHECKLIST

## PROCESSING

**MATERIAL NAME:** Oxygen

**CATEGORY:** Non-agricultural

Complete?: 3/17

✓

**NOSB Database Form**

✓

**References**

✓

**MSDS (or equivalent)**

      

**FASP (FDA)**

✓

**Date file mailed out:** 2/14/95

✓

**TAP Reviews from:** Bob Dorst

Richard Thauer

Steve Taylor

      

**Supplemental Information:**

*oil free, non oil source*

**MISSING INFORMATION:** \_\_\_\_\_

# NOSB/NATIONAL LIST COMMENT FORM/BALLOT

Use this page to write down comments and questions regarding the data presented in the file of this National List material. Also record your planned opinion/vote to save time at the meeting on the National List.

Name of Material Oxygen

Type of Use:  Crops;  Livestock;  Processing

TAP Review by:

1. Steve Taylor
2. Bob Dorf
3. Richard Theuer

Comments/Questions:

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My Opinion/Vote is:

Signature \_\_\_\_\_ Date \_\_\_\_\_

# USDA/TAP REVIEWER COMMENT FORM

Use this page or an equivalent to write down comments and summarize your evaluation regarding the data presented in the file of this potential National List material. Attach additional sheets if you wish.

This file is due back to us within 30 days of: 14 Feb

Name of Material: Oxygen

Reviewer Name: Stwe Taylor

Is this substance Natural or Synthetic? Explain (if appropriate)  
Natural

Please comment on the accuracy of the information in the file:

This material should be added to the National List as:  
 Synthetic Allowed       Prohibited Natural  
or,  This material does not belong on the National List because:

Are there any restrictions or limitations that should be placed on this material by use or application on the National List?

Any additional comments or references?

Signature Stwe Taylor

Date 3-5-95



# USDA/TAP Reviewer Comment Form

2.

Material: Oxygen

Reviewer: Bob Durst

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Is this substance Natural or Synthetic? Explain (if appropriate)

It is a natural substance. It is a common constituent of air.

Please comment on the accuracy of the information in the file:

The file is accurate.

This material should be added to the National List as:

Synthetic Allowed,

Prohibited Natural, or

This material does not belong on the National List because: it is a natural substance and would not need to be listed on an ingredient label.

Are there any restriction or limitations that should be placed on this material by use or application on the National List?

Any additional comments or references?

It should be used only in an oil-free grade.

Signature Robert W. Durst

Date 3/4/95



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USDA/TAP REVIEWER  
COMMENT FORM

Original mailing date: 14 Feb 1995.

Material: Oxygen  
Reviewer: Richard C. Theuer

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**NATURAL** Oxygen constitutes 20% of the air we breath.  
Nitrogen is separated from air cryogenically (super cold  
temperature liquefaction of air and fractional distillation).

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**COMMENTS RE SECTION 2119(m) CRITERIA:**

1. Oxygen gas is natural.
  2. Oxygen at high partial pressures chronically can cause tissue peroxidation.
  3. Pure oxygen has adverse health effects and vigorously accelerates combustion.
  3. Oxygen accelerates aerobic digestion of food wastes.
  4. This TAP reviewer is unaware of any direct food use of oxygen itself. Its product, ozone, has important disinfectant properties and is used to disinfect water without creating halogenated hydrocarbons.
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The following natural substance should be allowed as a processing aid or ingredient for organic foods. It should not be added to the National List of natural substances prohibited for use as ingredients or processing aids in Organic Food:

oxygen (gaseous or liquid)

12 Mar 1995





# NOSB Materials Database

4.

## Identification

**Common Name** **Oxygen** **Chemical Name**  
**Other Names**  
**Code #: CAS** **Code #: Other**  
**N. L. Category** Non-agricultural **MSDS**  yes  no

## Chemistry

**Family**  
**Composition** O<sub>2</sub>  
**Properties** colorless, odorless gas.  
**How Made** Nitrogen is separated from air cryogenically (super cold temperature liquefaction of air and fractional distillation). Natural.  
  
Processing

## Use/Action

**Type of Use**  
**Specific Use(s)** modified atmosphere. Olive processing.  
**Action**  
**Combinations**

## Status

**OFPA**  
**N. L. Restriction**  
**EPA, FDA, etc** FDA-GRAS  
**Directions**  
**Safety Guidelines**  
**State Differences**  
**Historical status**  
**International status** Allowed by IFOAM, EU and Codex.

# NOSB Materials Database

5.

## OFPA Criteria

2119(m)1: chemical interactions      Not Applicable

2119(m)2: toxicity & persistence      Not Applicable

2119(m)3: manufacture & disposal consequences

2119(m)4: effect on human health

Oxygen toxicity is possible at high concentrations.

2119(m)5: agroecosystem biology      Not Applicable

2119(m)6: alternatives to substance

Air.

2119(m)7: Is it compatible?

## References

See attached.

## OXYGEN REFERENCES

AU: Amanullah,-A.; Nienow,-A.W.; Emery,-A.N.; McFarlane,-C.M.

TI: The use of *Bacillus subtilis* as an oxygen sensitive culture to simulate dissolved oxygen cycling in large scale fermenters.

SO: Food-bioprod-process. Rugby [England] : The Institution ; a Basingstoke : Hemisphere Pub. Corp. [distributor], 1991-. Sept 1993. v. 71 (C3) p. 206-208.

CN: DNAL TP368.F64

AU: Garcia,-P.; Brenes,-M.; Garrido,-A.

TI: Effect of oxygen and temperature on the oxidation rate during darkening of ripe olives.

SO: J-Food-Eng. Essex : Elsevier Applied Science Publishers. 1991. v. 13 (4) p. 259-271.

CN: DNAL TP368.J68

AB: Darkening during ripe olive processing is due to oxidation and polymerization of polyphenols, but there are little quantitative data on these reactions. This investigation shows that the oxidation rate could be improved by higher dissolved oxygen concentrations, but this produces a more unstable colour than when using air. Increasing temperatures also accelerate fruit darkening without adverse effects, though heat can be applied only during the water rinses. As a result of this study, a process that is considerably shorter and produces less waste water is proposed. It consists of treating the olives with a sodium hydroxide solution followed by a water rinse at 50 degrees C. After 13-24 h the product has developed a sufficiently good colour to be packed.

AU: Shay,-B.J.; Egan,-A.F.

TI: Extending retail storage life of beef and lamb by modified atmosphere packaging.

SO: Food-Aust-Off-J-CAFTA-AIFST. North Sydney, Australia : Council of Australian Food Technology Associations. Aug 1990. v. 42 (8) p. 399-400, 404.

CN: DNAL TP368.F662

AU: Parkin,-K.L.; Schwobe,-M.A.

TI: Effects of low temperature and modified atmosphere on sugar accumulation and chip color in potatoes (*Solanum tuberosum*).

SO: J-Food-Sci-Off-Publ-Inst-Food-Technol. Chicago, Ill. : The Institute. Sept/Oct 1990. v. 55 (5) p. 1341-1344.

CN: DNAL 389.8-F7322

AB: Storage of Norgold and Russet Burbank tubers at 3 degrees C in air led to accumulation of sucrose and hexose and a decline in chip color quality to unacceptable levels (Hunter L values less than 40) within 2 wk. Storage in modified atmospheres of 1000 ppm ethylene in air and low oxygen delayed decline in color by 6-8 wk compared with storage in air. Storage in 1000 ppm ethylene apparently reduced rate of conversion of sucrose to hexose. The low oxygen atmosphere appeared to reduce extent of sucrose accumulation and rate of sucrose conversion to hexose during storage.

AU: Beuchat,-L.R.; Brackett,-R.E.

TI: Survival and growth of *Listeria monocytogenes* on lettuce as influenced by shredding, chlorine treatment, modified atmosphere packaging and temperature.

SO: J-Food-Sci-Off-Publ-Inst-Food-Technol. Chicago, Ill. : The Institute. May/June 1990. v. 55 (3) p. 755-758, 870.

CN: DNAL 389.8-F7322

AB: The effects of shredding, chlorine treatment and modified atmosphere packaging on survival and growth of *Listeria monocytogenes*, mesophilic aerobes, psychrotrophs and yeasts and molds on lettuce stored at 5 degrees C and 10 degrees C were determined. With the exception of shredded lettuce which had not been chlorine treated, no significant changes in populations of *L. monocytogenes* were detected during the first 8 days of incubation at 5 degrees C; significant increases occurred between 8 and 15 days. Significant increases occurred within 3 days when lettuce was stored at 10 degrees C; after 10 days, populations reached 10(8)-10(9) CFU/g. Chlorine treatment, modified atmosphere (3% O<sub>2</sub>, 97% N<sub>2</sub>) and shredding did not influence growth of *L. monocytogenes*. It was concluded that *L. monocytogenes* is capable of growing on lettuce subjected to commonly used packaging and distribution procedures used in the food industry.

AU: Lawlis,-T.L.; Fuller,-S.L.

TI: Modified-atmosphere packaging incorporating an oxygen-barrier shrink film.

SO: Food-Technol. Chicago, Ill. : Institute of Food Technologists. June 1990. v. 44 (6) p. 124. ill.

CN: DNAL 389.8-F7398

AB: Abstract: Modified-atmosphere packaging provides a means to provide freshness, quality and convenience of many meat products. Topics discussed are the process details, materials used, the benefits of oxygen-barrier properties, and safety aspects.

AU: Walter,-R-H; Sherman,-R-M

TI: Reduction in chemical oxygen demand of ozonated sugar solutions by charcoal [This procedure might find application in the recycling of water in food processing industries]

SO: J-Food-Sci, Mar/Apr 1978, 43 (2): 404-406.

CN: DNAL 389.8-F7322

AU: Koehrsen,-L-G; Archuleta,-E-G

TI: Air and pure oxygen activated sludge treatment of a high-strength waste [Food processing, leather tannery, meat packing]

SO: Eng-Ext-Ser-Purdue-Univ, 1973, 142 (pt. 1): 205-213.

CN: DNAL 290.9-P972

MATERIAL SAFETY DATA SHEET  
OXYGEN

SECTION I - Product Identification

PRODUCT NAME: OXYGEN  
COMPANY NAME: LIQUID AIR CORP. CHEMICAL FAMILY: OXIDIZER  
DATE: OCTOBER 1, 1985 EMERGENCY TELEPHONE: (415)977-6500

SECTION II - Hazardous Components

OXYGEN VIGOROUSLY ACCELERATES COMBUSTION. CONTACT WITH ALL FLAMMABLE MATERIALS SHOULD BE AVOIDED. SOME MATERIALS WHICH ARE NOT FLAMMABLE IN AIR WILL BURN IN PURE OXYGEN OR OXYGEN-ENRICHED ATMOSPHERES.

SECTION III - Physical Data

BOILING POINT: -297.35 F VAPOR PRESSURE: @ 70 F ABOVE CRITICAL TEMP. OF -181.433 F  
SOLUBILITY IN WATER @ 68 F BUNSEN COEFFICIENT = .0310  
LIQUID DENSITY AT BOILING POINT: 71.23 LB/FT3 GAS DENSITY AT 70 F 1 ATM: -361.838 F  
APPEARANCE AND ODOR: COLORLESS, ODORLESS AND TASTELESS GAS  
SPECIFIC GRAVITY: @ 70 F (AIR=1) IS 1.11

SECTION IV - Fire and Explosion Hazard Data

FLASH POINT: NONE GIVEN  
AUTO IGNITION TEMP.: NONE GIVEN  
FLAMMABLE LIMITS % BY VOLUME: NONE GIVEN  
EXTINGUISHING MEDIA: COPIOUS QUANTITIES OF WATER FOR FIRES WITH OXYGEN AS THE OXIDIZER.  
SPECIAL FIRE FIGHTING PROCEDURES: IF POSSIBLE, STOP THE FLOW OF OXYGEN WHICH IS SUPPORTING THE FIRE.  
UNUSUAL FIRE AND EXPLOSION HAZARDS: VIGOROUSLY ACCELERATED COMBUSTION.

SECTION V - Health Hazard Data

EFFECTS OF OVEREXPOSURE:  
INHALATION: HYPEROXIA WHICH INCLUDE CRAMPS, NAUSEA, DIZZINESS, HYPOTHERMIA, AMBYLOPIA, RESPIRATORY DIFFICULTIES, BRADYCARDIA, FAINTING SPELLS AND CONVULSIONS CAPABLE OF DEATH.  
EMERGENCY FIRST AID:  
INHALATION: CONSCIOUS PERSONS SHOULD BE ASSISTED TO AN UNCONTAMINATED AREA AND BREATHE FRESH AIR. THEY SHOULD BE KEPT WARM AND QUIET. TEH PHYSICIAN SHOULD BE INFORMED THAT THE VICTIM IS EXPERIENCING HYPEROXIA.  
UNCONSCIOUS PERSONS SHOULD BE MOVED TO AN UNCONTAMINATED AREA AND GIVEN ASSISTED RESPIRATION. WHEN BREATHING HAS BEEN RESTORED, TREATMENT SHOULD BE AS ABOVE. CONTINUED TREATMENT SHOULD BE SYMPTOMATIC AND SUPPORTIVE.

SECTION VI - Reactivity Data

STABILITY: STABLE  
INCOMPATIBILITY: ALL FLAMMABLE MATERIALS  
HAZARDOUS DECOMPOSITION PRODUCTS: NONE GIVEN  
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

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**SECTION VII - Spill and Disposal Procedures**  
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SPILLS: EVACUATE ALL PERSONNEL FROM AFFECTED AREA. USE APPROPRIATE PROTECTIVE EQUIPMENT. IF LEAK IS IN USER'S EQUIPMENT, BE CERTAIN TO PURGE PIPING WITH AN INERT GAS PRIOR TO ATTEMPTING REPAIRS. IF LEAK IS IN CONTAINER VALVE, CONTACT THE CLOSEST LIQUID AIR CORP.

DISPOSAL: DO NOT ATTEMPT TO DISPOSE OF RESIDUAL OR UNUSED QUANTITIES. RETURN IN THE SHIPPING CONTAINER PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE TO LIQUID AIR CORP. FOR DIPOSAL. FOR EMERGENCY DISPOSAL, CONTACT THE CLOSEST LIQUID AIR CORP.

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**SECTION VIII - Protective Equipment**  
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RESPIRATORY PROTECTION: NONE GIVEN

VENTILATION: TO PREVENT ACCUMULATION ABOVE 25 MOLAR PERCENT

LOCAL EXHAUST: " " "

PROTECTIVE GLOVES: AS REQUIRED; ANY MATERIAL

EYE PROTECTION: SAFETY GOGGLES OR GLASSES

OTHER: SAFETY SHOES, SAFETY SHOWER

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**SECTION IX - Storage and Handling Precautions**  
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HANDLING: USE IN WELL-VENTILATED AREAS. KEEP VALVE AND CAPS IN PLACE. DO NOT DRAG, SLIDE, OR ROLL. USE HAND TRUCK TO MOVE. DO NOT HEAT.

STORAGE: PROTECT FROM PHYSICAL DAMAGE. STORE IN COOL, DRY, WELL-VENTILATED AREA AWAY FROM TRAFFIC AND EXITS. DO NOT LET EXCEED 130 F.

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**SECTION X - Transportation Data and Additional Information**  
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NA

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(TM) and (R) : Registered Trademarks

N/A = Not Applicable OR Not Available

The information published in this Material Safety Data Sheet has been compiled from our experience and data presented in various technical publications. It is the user's responsibility to determine the suitability of this information for adoption of necessary safety precautions. We reserve the right to revise Material Safety Data Sheets periodically as new information becomes available.

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