

AIR PRODUCTS AND CHEMICALS INC -- OXYGEN, REFRIGERATED LIQUID -- 9135-00-965-2527  
===== Product Identification =====

Product ID:OXYGEN, REFRIGERATED LIQUID  
MSDS Date:04/01/1998  
FSC:9135  
NIIN:00-965-2527  
Status Code:A  
MSDS Number: CKSFM  
=== Responsible Party ===  
Company Name:AIR PRODUCTS AND CHEMICALS INC  
Address:7201 HAMILTON BLVD  
City:ALLENTOWN  
State:PA  
ZIP:18195-1501  
Country:US  
Info Phone Num:800-752-1597  
Emergency Phone Num:800-752-1597  
CAGE:00742  
=== Contractor Identification ===  
Company Name:AIR PRODUCTS AND CHEMICALS INC  
Address:7201 HAMILTON BLVD  
Box:City:ALLENTOWN  
State:PA  
ZIP:18195-1501  
Country:US  
Phone:800-345-3148/ 800-752-1597  
Contract Num:F41608-99-D-0569  
CAGE:00742

===== Composition/Information on Ingredients =====

Ingred Name:OXYGEN  
CAS:7782-44-7  
RTECS #:RS2060000  
> Wt:99.

===== Hazards Identification =====

LD50 LC

50 Mixture:NONE SPECIFIED BY MANUFACTURER.

Routes of Entry: Inhalation:YES Skin:NO Ingestion:NO

Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO

Health Hazards Acute and Chronic:INHALATION: BREATHING 80% OR MORE

OXYGEN AT ATMOSPHERIC PRESSURE FOR MORE THAN A FEW HOURS MAY CAUSE NASAL STUFFINESS, COUGH, SORE THROAT, CHEST PAIN AND BREATHING DIFFICULTY. BREATHING PURE OXYGEN UNDER PRESSURE MAY CAUSE LUNG DAMAGE AND ALSO CENTRAL NERVOUS SYSTEM EFFECTS RESULTING IN DIZZINE

SS, POOR COORDINATION, TINGLING SENSATION, VISUAL AND

HEARING DISTURBANCES, MUSCULAR TWITCHING, UNCONSCIOUSNESS AND CONVULSIONS. EYE, SKIN & INGESTION: TISSUE FREEZING AND SEVERE CRYOGENIC BURNS ON CONTACT WITH LIQUID. NO ADVERSE EFFECT EXPECTED FROM VAPOR.

Explanation of Carcinogenicity:NOT RELEVANT.

Effects of Overexposure:NO EVIDENCE OF ADVERSE EFFECTS FROM REPEATED EXPOSURE AVAILABLE.

Medical Cond Aggravated by Exposure:PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY D

ISEASE RETAIN CARBON DIOXIDE ABNORMALLY. IF OXYGEN IS

ADMINISTERED TO THEM, RAISING THE OXYGEN CONCENTRATION IN THEIR BLOOD CAN DEPRESS THEIR BREATHING.

===== First Aid Measures =====

First Aid:INGESTION: CALL MD IMMEDIATELY. INHALATION: MOVE TO FRESH

AIR. CALL PHYS. PHYS SHOULD BE ADVISED THAT VICTIM HAS BEEN EXPOSED TO HIGH CONCENTRATION OF OXYGEN. RESCUE PERSONNEL SHOULD BE AWARE OF EXTREME FIRE HAZARDS. EYES: IMMEDIATELY FLUSH W/W

WATER FOR 15

MINUTES. SEE A PHYS, PREFERABLY OPHTHALMOLOGIST, IMMEDIATELY. SKIN: FOR EXPOSURE TO LIQUID, IMMEDIATELY WARM FROSTBITE AREA W/WARM WATER. SUPPORTIVE TREATMENT: IMMEDIATE SEDATION, ANTI-CONVULSIVE IF NEEDED, & REST.

===== Fire Fighting Measures =====

Autoignition Temp:Autoignition Temp Text:NONFLA

Lower Limits:NONFLAM

Upper Limits:NONFLAM

Extinguishing Media:MATERIAL IS NON FLAMMABLE. USE EXTINGUISHING MEDIA APPROPRIATE FOR SURR

**OUNDING FIRE.**

Fire Fighting Procedures:NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT. EVACUATE ALL PERSONNEL FROM DANGER AREA. IF POSSIBLE, SHUT OFF FLOW OF OXYGEN WHICH IS SUPPORTING FIRE. IMMEDIATELY COOL CONTAINERS.

Unusual Fire/Explosion Hazard:OXIDIZING AGENT, VIGOROUSLY ACCELERATES COMBUSTION. SOME MATERIALS WHICH ARE NONCOMBUSTIBLE IN AIR WILL BURN IN PRESENCE OF OXYGEN ENRICHED ATMOSPHERE (>23%). FIRE-RESISTANT CLOTHING MAY BURN AND OFFE R NO PROTECTION IN OXYGE

N RICH ATMOSPHERES. OXYGEN MAY FORM EXPLOSIVE COMPOUNDS WHEN EXPOSED TO COMBUSTIBLE MATERIALS.

===== Accidental Release Measures =====

Spill Release Procedures:EVACUATE ALL UNNECESSARY PERSONNEL FROM AFFECTED AREA. SHUT OFF SOURCE OF OXYGEN, IF POSSIBLE, SEPARATE COMBUSTIBLES FROM THE LEAK. REMOVE SOURCES OF HEAT& IGNITION. VENTILATE AREA OR REMOVE LEAKING C ONTAINER TO WELL-VENTILATED AREA. IF POSSIBLE, PREVENT LIQUID OXYGEN FROM CONCENTRAT ING.

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:STORE & USE W/ADEQUATE VENTILATION. DO NOT STORE IN CONFINED SPACE. CRYOGENIC CONTAINERS ARE EQUIPPED W/PRESSURE RELIEF DEVICES TO CONTROL INTERNAL PRESSURE.

Other Precautions:ALL GAUGES, VALVES, REGULATORS, PIPING & EQUIPMENT TO BE USED IN OXYGEN SERVICE SHOULD BE USED IN ACCORDANCE WITH CGA PAMPHLET G-4.1 USE PIPING AND E QUIPMENT ADEQUATELY DESIGNED TO WITHSTAND PRESSURES TO BE ENCOUNTERED. SOME METALS SUCH AS CARBON STEEL MAY BECOME BRITTLE AT LOW TEMPERATURES AND WIL L EASILY FRACTURE.

===== Exposure Controls/Personal Protection =====

Respiratory Protection:GENERAL USE: NOT REQUIRED. EMERGENCY USE: USE NIOSH APPROVED SCBA DUE TO POSSIBILTY OF FIRE WHEN CONCENTRATIONS EXCEED 23%.

Ventilation:NATURAL OR MECHANICAL TO PREVENT OXYGEN-ENRICHED ATMOSPHERES OVER 21% OXYGE

N.  
Protective Gloves:LOOSE FIT THERMAL INSULATED/LEATHER.  
Eye Protection:SAFETY GLASSES.  
Other Protective Equipment:SAFETY SHOES WHEN HANDLING CONTAINERS. LONG SLEEVE SHIRTS & TROUSERS W/OUT CUFFS. ANSI APPROVED EYE WASH & DELUGE SHOWER.  
Work Hygienic Practices:GLOVES MUST BE CLEAN & FREE OF OIL & GREASE. CONTACT NEHC FOR MORE SPECIFIC INFORMATION.  
Supplemental Safety and Health  
NFPA RATINGS: HEALTH=3;FLAMMABILITY=0;REACTIVITY=0;SPECIAL-OX. HMIS RATINGS: HEALTH=3;FLAMMABILITY=0;R EACTIVITY=0. MOLECULAR WT = 32; GAS DENSITY = 0.083 LB/FT3; EXPANSION RATIO: 1 TO 860.5

===== Physical/Chemical Properties =====

Boiling Pt:=-182.9C, -297.3F  
Melt/Freeze Pt:=-218.8C, -361.9F  
Spec Gravity:1.1 (AIR=1)  
Evaporation Rate & Reference:GAS, NOT APPLICABLE.  
Solubility in Water:0.049 VOL/VOL @ 32F.  
Appearance and Odor:LIQUID BLUE, ODORLESS CRYOGENIC LIQUID.

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES  
FLAMMABLE MATERIALS, HYDROCARBONS SUCH AS OILS & GREASE, ASPHALT, ETHERS, ALCOHOLS, ACIDS & ALDEHYDES. OXYGEN REACTS W/MANY MATERIALS.  
Stability Condition to Avoid:NONE.  
Hazardous Decomposition Products:NONE.

===== Toxicological Information =====

Toxicological Information:AT ATMOSPHERIC CONCENTRATION AND PRESSURE, OXYGEN POSES NO TOXICITY HAZARDS. PREMATURE INFANTS EXPOSED TO HIGH OXYGEN CONCENTRATIONS MAY SUFFER DELAYED RETINAL DAMAGE WHICH CAN PROGRESS TO RETINAL DETACHMENT AND BLINDNESS. RETINAL DAMAGE MAY ALSO OCCUR IN ADULTS EXPOSED TO 100% OXYGEN FOR EXTENDED PERIODS (24 TO 48 HR). AT TWO OR MORE ATMOSPHERES CNS TOXICITY OCCURS ( NAUSEA, VOMITING, DIZZINESS OR VERTIGO, MUSCLE TWITCHING, VISION CHANGES, AND LOSS OF CONSCIOUSNESS AND GENERALIZED SEIZURES). AT THREE ATMOSPHERES, CNS TOXICITY OCCURS IN LESS THAN TWO HOURS, AND AT SIX ATMOSPHERES ONLY MINUTES.

===== Ecological Information =====

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Ecological:THE ATMOSPHERE CONTAINS APPROXIMATELY 21% OXYGEN. NO ADVERSE ECOLOGICAL EFFECTS ARE EXPECTED. OXYGEN DOES NOT CONTAIN ANY CLASS I OR CLASS II OZONE DEPLETING CHEMICALS (40 CFR PART 82). OXYGEN IS NOT LISTED AS A MARINE POLLUTANT BY DOT (49 CFR PART 171).

===== Disposal Considerations =====

Waste Disposal Methods:DO NOT ATTEMPT TO DISPOSE OF RESIDUAL OR UNUSED QUANTITIES. CONTACT YOUR SUPPLIER. FOR EMERGENCY DISPOSAL, DISCHARGE SLOWLY TO ATMOSPHERE IN A WELL VENTILATED AREA OR OUTDOORS. DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

===== MSDS Transport Information =====

Transport Information:TRANSPORT SECURED UPRIGHT POSITION IN A WELL VENTILATED TRUCK. NEVER TRANSPORT IN PASSENGER COMPARTMENT OR ENCLOSED VEHICLE. AN OXYGEN LABEL MAY BE USED FOR DOMESTIC SHIPMENTS IN THE U.S. OR CANADA IN PLACE OF THE NONFLAMMABLE AND OXIDIZER LABELS (49 CFR PART 172). SHIPMENT OF COMPRESSED GAS CYLINDERS WHICH HAVE BEEN FILLED WITHOUT THE OWNER'S CONSENT IS A VIOLATION OF FEDERAL LAW (49 CFR PART 173.301(B)). DOT SHIPPING NAME: OXYGEN, REFRIGERATED LIQUID;HAZARD CLASS:2.2;IDENTIFICATION NUMBER:UN 1073;SHIPPING LABEL:NON-FLAMMABLE GAS AND OXIDANT OR OXYGEN;PLACARD:NONFLAMMABLE GAS OR OXYGEN

===== Regulatory Information =====

SARA Title III Information:SECTIONS 302/304:EMERGENCY PLANNING AND NOTIFICATION (40 CFR PART 355) EXTREMELY HAZARDOUS SUBSTANCES:NONE;THRESHOLD PLANNING QUANTITY:NONE SECTIONS 311/312:HAZARDOUS CHEMICAL REPORTING (40 CFR PART 370) IMMEDIATE HEALTH:YES;PRESSURE:YES;DELAYED HEALTH:NO;REACTIVITY:YES;FIRE:YES SECTION 313:TOXIC CHEMICAL RELEASE REPORTING (40 CFR PART 372) OXYGEN DOES NOT REQUIRE REPORTING UNDER SECTION 313. 40 CFR PART 68:RISK MANAGEMENT PROGRAMS FOR CHEMICAL ACCIDENTAL

RELEASE

PREVENTION OXYGEN IS NOT LISTED AS A REGULATED SUBSTANCE.

Federal Regulatory Information:EPA-CERCLA:COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980. (40 CFR PARTS 117 AND 302) REPORTABLE QUANTITY (RQ): NONE. TSCA:OXYGEN IS LISTED ON THE TSCA INVENTORY.

State Regulatory Information:CALIFORNIA: PROPOSITION 65: THIS PRODUCT DOES NOT CONTAIN ANY LISTED SUBSTANCES WHICH THE STATE OF CALIFORNIA REQUIRES WARNING UNDER THIS STATUTE.

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===== Other Information =====

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