

MATERIAL SAFETY DATA SHEET

P-DIOXANE
J.T.BAKER MSDS

Revised: 09/05/00
Replaces: None
Printed: 07/08/06

PRODUCT IDENTIFICATION

PRODUCT NAME: P-DIOXANE
COMMON SYNONYMS: 1,4-DIOXANE; DIETHYLENE DIOXIDE; DIETHYLENE ETHER
CHEMICAL FAMILY: ETHERS
FORMULA: C4H8O2
FORMULA WT.: 88.11
CAS NO.: 123-91-1
NIOSH/RTECS NO.: JG8225000
PRODUCT USE: LABORATORY REAGENT
PRODUCT CODES: 9228,K471,K471,K472,9231,9196,9232
CHEMTREC # (800) 424-9300 NATIONAL RESPONSE CENTER # (800) 424-8802
J.T.BAKER INC. 222 RED SCHOOL LANE PHILLIPSBURG, NJ 08865 24-HOUR
EMERGENCY TELEPHONE -- (201) 859-2151
EFFECTIVE: 07/21/94 ISSUED: 04/08/95
REVISION #07

PRECAUTIONARY LABELING

BAKER SAF-T-DATA* SYSTEM

HEALTH	-	3	SEVERE (CANCER CAUSING)
FLAMMABILITY	-	4	EXTREME (FLAMMABLE)
REACTIVITY	-	2	MODERATE
CONTACT	-	3	SEVERE (LIFE)

LABORATORY PROTECTIVE EQUIPMENT

GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER

U.S. PRECAUTIONARY LABELING

DANGER

FLAMMABLE. HARMFUL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN. TENDS TO FORM EXPLOSIVE PEROXIDES, ESPECIALLY WHEN ANHYDROUS. NOTE: REPORTED AS CAUSING CANCER IN LABORATORY ANIMALS. EXERCISE DUE CARE. EXCEPTIONAL HEALTH AND CONTACT HAZARDS. BEFORE USING, READ MATERIAL SAFETY DATA SHEET (MSDS) FOR THIS MATERIAL.
KEEP AWAY FROM HEAT, SPARKS, FLAME. DO NOT GET IN EYES, ON SKIN, ON CLOTHING.
DO NOT BREATHE VAPOR. KEEP IN TIGHTLY CLOSED CONTAINER IN A COOL AREA AWAY FROM DIRECT SUNLIGHT. LOOSEN CLOSURE CAUTIOUSLY. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING. IN CASE OF FIRE, USE ALCOHOL FOAM, DRY CHEMICAL, CARBON DIOXIDE - WATER MAY BE INEFFECTIVE. IN CASE OF SPILL, SOAK UP WITH SAND OR EARTH. FLUSH SPILL AREA WITH WATER.

INTERNATIONAL LABELING

AVOID CONTACT WITH EYES. AFTER CONTACT WITH SKIN, WASH IMMEDIATELY WITH PLENTY OF WATER. KEEP CONTAINER TIGHTLY CLOSED.

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SAF-T-DATA* STORAGE COLOR CODE: RED (FLAMMABLE)

COMPONENTS

COMPONENT	CAS NO.	WEIGHT %	OSHA/PEL
ACGIH/TLV			
P-DIOXANE	123-91-1	99-100	25 PPM 25

PPM
SODIUM DIETHYLDITHIOCARBAMATE IS ADDED AS A PRESERVATIVE. THE TLV AND PEL

LISTED FOR P-DIOXANE DENOTE TLV (SKIN) AND PEL (SKIN).

PHYSICAL DATA

BOILING POINT: 101 C (213 F) (AT 760 MM HG)	VAPOR PRESSURE (MMHG): 27 (20 C)
MELTING POINT: 12 C (53 F) (AT 760 MM HG)	VAPOR DENSITY (AIR=1): 3.0
SPECIFIC GRAVITY: 1.04 (H2O=1)	EVAPORATION RATE: 2.7 (BUTYL ACETATE = 1)
SOLUBILITY(H2O): COMPLETE (100%)	% VOLATILES BY VOLUME: 100 (21 C)

PH: N/A

ODOR THRESHOLD (P.P.M.): N/A

PHYSICAL STATE: LIQUID

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

APPEARANCE & ODOR: CLEAR, COLORLESS LIQUID. FAINT ETHER-LIKE ODOR.

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP): 12 C (54 F) NFPA 704M RATING: 2-3-1

AUTOIGNITION TEMPERATURE: 179 C (356 F)

FLAMMABLE LIMITS: UPPER - 22.0 % LOWER - 2.0 %

FIRE EXTINGUISHING MEDIA

USE ALCOHOL FOAM, DRY CHEMICAL OR CARBON DIOXIDE. (WATER MAY BE INEFFECTIVE.)

SPECIAL FIRE-FIGHTING PROCEDURES

FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED

BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE

MODE. MOVE CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. USE

WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

UNUSUAL FIRE & EXPLOSION HAZARDS

VAPORS MAY FLOW ALONG SURFACES TO DISTANT IGNITION SOURCES AND FLASH BACK.

CLOSED CONTAINERS EXPOSED TO HEAT MAY EXPLODE. CONTACT WITH STRONG OXIDIZERS MAY CAUSE FIRE. MAY FORM EXPLOSIVE PEROXIDES, ESPECIALLY WHEN

HEATED.

TOXIC GASES PRODUCED

CARBON MONOXIDE, CARBON DIOXIDE

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT

NONE IDENTIFIED.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE

YES.

HEALTH HAZARD DATA

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THRESHOLD LIMIT VALUE (TLV/TWA): 90 MG/M (25 PPM)
THE TLV LISTED DENOTES TLV (SKIN).
SHORT-TERM EXPOSURE LIMIT (STEL): NOT ESTABLISHED
PERMISSIBLE EXPOSURE LIMIT (PEL): 90 MG/M (25 PPM)
THE PEL LISTED DENOTES PEL (SKIN).

TOXICITY OF COMPONENTS

ORAL RAT LD50 FOR P-DIOXANE 4200
MG/KG
INTRAPERITONEAL RAT LD50 FOR P-DIOXANE 5600
MG/KG
SKIN RABBIT LD50 FOR P-DIOXANE 7600
MG/KG
INHALATION-2HR RAT LC50 FOR P-DIOXANE 46
G/M

CARCINOGENICITY: NTP: YES IARC: YES Z LIST: NO OSHA REG: NO
CARCINOGENICITY

THIS SUBSTANCE IS LISTED AS A NTP ANTICIPATED HUMAN CARCINOGEN AND
AN IARC

PROBABLE HUMAN CARCINOGEN (GROUPS 2A AND 2B).

REPRODUCTIVE EFFECTS

NONE IDENTIFIED.

EFFECTS OF OVEREXPOSURE

INHALATION: HEADACHE, NAUSEA, VOMITING, DIZZINESS, DROWSINESS,
IRRITATION OF UPPER RESPIRATORY TRACT,

UNCONSCIOUSNESS

SKIN CONTACT: IRRITATION, DERMATITIS
EYE CONTACT: IRRITATION, PROLONGED CONTACT MAY CAUSE BURNS
SKIN ABSORPTION: MAY BE HARMFUL
INGESTION: NAUSEA, VOMITING, DIARRHEA
CHRONIC EFFECTS: KIDNEY DAMAGE, LIVER DAMAGE

TARGET ORGANS

LIVER, KIDNEYS, EYES, SKIN

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

NONE IDENTIFIED

PRIMARY ROUTES OF ENTRY

INHALATION, INGESTION, ABSORPTION, EYE CONTACT, SKIN CONTACT

EMERGENCY AND FIRST AID PROCEDURES

INGESTION: CALL A PHYSICIAN. IF SWALLOWED, IF CONSCIOUS, GIVE
LARGE

AMOUNTS OF WATER. INDUCE VOMITING.

INHALATION: IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING,
GIVE

ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT,
GIVE

OXYGEN. PROMPT ACTION IS ESSENTIAL.

SKIN CONTACT: IN CASE OF CONTACT, IMMEDIATELY FLUSH SKIN WITH PLENTY
OF

WATER FOR AT LEAST 15 MINUTES WHILE REMOVING
CONTAMINATED

CLOTHING AND SHOES. WASH CLOTHING BEFORE RE-USE.

EYE CONTACT: IN CASE OF EYE CONTACT, IMMEDIATELY FLUSH WITH PLENTY
OF

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WATER FOR AT LEAST 15 MINUTES.

SARA/TITLE III HAZARD CATEGORIES AND LISTS

ACUTE: YES CHRONIC: YES FLAMMABILITY: YES PRESSURE: NO REACTIVITY: NO
EXTREMELY HAZARDOUS SUBSTANCE: NO
CERCLA HAZARDOUS SUBSTANCE: YES CONTAINS 1,4-DIETHYLENE DIOXIDE (RQ
= 1

LB)
SARA 313 TOXIC CHEMICALS: YES CONTAINS 1,4-DIOXANE
GENERIC CLASS: GENERIC CLASS REMOVED FROM CFR:

7/1/91

TSCA INVENTORY: YES

STATE LISTS: FOR PRODUCTS SOLD IN THE STATE OF CALIFORNIA, THE STATE
REQUIRES

THAT WE PROVIDE TO USERS AND THEIR EMPLOYEES THE FOLLOWING MESSAGE:

WARNING:

THIS PRODUCT IS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE
CANCER.

REACTIVITY DATA

STABILITY: UNSTABLE HAZARDOUS POLYMERIZATION: WILL NOT
OCCUR

CONDITIONS TO AVOID: HEAT, FLAME, OTHER SOURCES OF IGNITION, AIR,
SUNLIGHT

INCOMPATIBLES: STRONG OXIDIZING AGENTS, SULFUR TRIOXIDE,
HYDROGEN

CHLORIDE

DECOMPOSITION PRODUCTS: EXPLOSIVE PEROXIDES, CARBON MONOXIDE, CARBON
DIOXIDE

SPILL & DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE

WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE
CLOTHING. SHUT

OFF IGNITION SOURCES; NO FLARES, SMOKING OR FLAMES IN AREA. STOP
LEAK IF

YOU CAN DO SO WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. TAKE
UP

WITH SAND OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIAL AND PLACE INTO
CONTAINER FOR LATER DISPOSAL. FLUSH AREA WITH WATER.

J. T. BAKER SOLUSORB(R) SOLVENT ADSORBENT IS RECOMMENDED FOR SPILLS OF
THIS

PRODUCT.

DISPOSAL PROCEDURE

DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL
ENVIRONMENTAL REGULATIONS.

EPA HAZARDOUS WASTE NUMBER: U108 (TOXIC WASTE)

INDUSTRIAL PROTECTIVE EQUIPMENT

VENTILATION: USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET
TLV

REQUIREMENTS.

RESPIRATORY PROTECTION: RESPIRATORY PROTECTION REQUIRED IF AIRBORNE
CONCENTRATION EXCEEDS TLV. AT CONCENTRATIONS

ABOVE 25

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PPM, A SELF-CONTAINED BREATHING APPARATUS IS ADVISED.
EYE/SKIN PROTECTION: SAFETY GOGGLES AND FACE SHIELD,
UNIFORM, PROTECTIVE SUIT, NEOPRENE GLOVES ARE RECOMMENDED.

STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA* STORAGE COLOR CODE: RED (FLAMMABLE)

STORAGE REQUIREMENTS

KEEP CONTAINER TIGHTLY CLOSED. STORE IN A COOL, DRY, WELL-VENTILATED, FLAMMABLE LIQUID STORAGE AREA. PRODUCT FREEZES AT ABOUT 11 C. MAINTAIN ABOVE THIS TEMPERATURE.

SPECIAL PRECAUTIONS

BOND AND GROUND CONTAINERS WHEN TRANSFERRING LIQUID. USE CAUTION WHEN OPENING CAP. IMPORTANT - DO NOT USE AFTER EXPIRATION DATE.

TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME: DIOXANE

HAZARD CLASS: 3

UN/NA: UN1165 REPORTABLE QUANTITY: 100 LBS. PACKAGING GROUP: II

LABELS: 3 FLAMMABLE LIQUID

REGULATORY REFERENCES: 49CFR 172.101

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME: DIOXANE

HAZARD CLASS: 3.2

I.M.O. PAGE: 3217

UN: UN1165 MARINE POLLUTANTS: NO

PACKAGING GROUP: II

LABELS: 3 FLAMMABLE LIQUID

REGULATORY REFERENCES: 49CFR PART 176; IMDG CODE

AIR (I.C.A.O.)

PROPER SHIPPING NAME: DIOXANE

HAZARD CLASS: 3

UN: UN1165

PACKAGING GROUP: II

LABELS: 3 FLAMMABLE LIQUID

REGULATORY REFERENCES: 49CFR PART 175; ICAO=== WE BELIEVE THE TRANSPORTATION

FACTUAL AND DATA AND REFERENCES CONTAINED HEREIN TO BE
MEANT AS THE OPINION OF QUALIFIED EXPERTS. THE DATA IS
PRODUCT A GUIDE TO THE OVERALL CLASSIFICATION OF THE
BE AND IS NOT PACKAGE SIZE SPECIFIC, NOR SHOULD IT
THE TAKEN AS A WARRANTY OR REPRESENTATION FOR WHICH
CONSIDERATION, COMPANY ASSUMES LEGAL RESPONSIBILITY.=== THE
INFORMATION IS OFFERED SOLELY FOR YOUR

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INVESTIGATION, AND VERIFICATION. ANY USE OF THE INFORMATION MUST BE DETERMINED BY THE USER TO BE IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS. SEE SHIPPER REQUIREMENTS 49CFR 171.2, CERTIFICATION 172.204, AND EMPLOYEE TRAINING 49 CFR 173.1(B).

U.S. CUSTOMS HARMONIZATION NUMBER: 29092000004

NOTE: WHEN HANDLING LIQUID PRODUCTS, SECONDARY PROTECTIVE CONTAINERS MUST BE USED FOR CARRYING. N/A = NOT APPLICABLE, OR NOT AVAILABLE N/E = NOT ESTABLISHED. THE INFORMATION IN THIS MATERIAL SAFETY DATA SHEET MEETS THE REQUIREMENTS OF THE UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ACT AND REGULATIONS PROMULGATED THEREUNDER (29 CFR 1910.1200 ET. SEQ.) AND THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. THIS DOCUMENT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE MATERIAL BY A PERSON TRAINED IN, OR SUPERVISED BY A PERSON TRAINED IN, CHEMICAL HANDLING. THE USE IS RESPONSIBLE FOR DETERMINING THE PRECAUTIONS AND DANGERS OF THIS CHEMICAL FOR HIS OR HER PARTICULAR APPLICATION. DEPENDING ON USAGE, PROTECTIVE CLOTHING INCLUDING EYE AND FACE GUARDS AND RESPIRATORS MUST BE USED TO AVOID CONTACT WITH MATERIAL OR BREATHING CHEMICAL VAPORS/FUMES. EXPOSURE TO THIS PRODUCT MAY HAVE SERIOUS ADVERSE HEALTH EFFECTS. THIS CHEMICAL MAY INTERACT WITH OTHER SUBSTANCES. SINCE THE POTENTIAL USES ARE SO VARIED, BAKER CANNOT WARN OF ALL OF THE POTENTIAL DANGERS OF USE OR INTERACTION WITH OTHER CHEMICALS OR MATERIALS. BAKER WARRANTS THAT THE CHEMICAL MEETS THE SPECIFICATIONS SET FORTH ON THE LABEL. BAKER DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE. THE USER SHOULD RECOGNIZE THAT THIS PRODUCT CAN CAUSE SEVERE INJURY AND EVEN DEATH, ESPECIALLY IF IMPROPERLY HANDLED OR THE KNOWN DANGERS OF USE ARE NOT HEEDED. READ ALL PRECAUTIONARY INFORMATION. AS NEW DOCUMENTED GENERAL SAFETY INFORMATION BECOMES AVAILABLE, BAKER WILL PERIODICALLY REVISE THIS MATERIAL SAFETY DATA SHEET. NOTE: CHEMTREC, CANUTEC, AND NATIONAL RESPONSE CENTER EMERGENCY TELEPHONE NUMBERS ARE TO BE USED ONLY IN THE EVENT OF CHEMICAL EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT INVOLVING CHEMICALS. ALL NON-EMERGENCY QUESTIONS SHOULD BE DIRECTED TO CUSTOMER SERVICE (1-800-JTBAKER ASSISTANCE. COPYRIGHT 1995 J.T.BAKER INC. * TRADEMARKS OF J.T.BAKER INC. APPROVED BY QUALITY ASSURANCE DEPARTMENT.