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MATERIAL SAFETY DATA SHEETS

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GLYCOL ETHER PNB (Propylene Monomethyl Ether Acetate)

PRODUCT NAME: GLYCOL ETHER PNB
MSDS NUMBER: DZ05790

2. COMPOSITION/INFORMATION ON INGREDIENTS

PROPYLENE GLYCOL N-BUTYL ETHER
(PROPYLENE GLYCOL MONOBUTYL ETHER) 99%
2-PROPANOL-1-BUTOXY CAS# 005131-66-8
1-PROPANOL-2-BUTOXY CAS# 015821-83-7

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

* CLEAR LIQUID. MILD ODOR. CAUSES EYE IRRITATION. COMBUSTIBLE. *

POTENTIAL HEALTH EFFECTS (SEE SECTION 11 FOR TOXICOLOGICAL DATA.)

EYE: MAY CAUSE MODERATE EYE IRRITATION. MAY CAUSE MODERATE CORNEAL INJURY. VAPORS MAY IRRITATE EYES.

SKIN: PROLONGED OR REPEATED EXPOSURE MAY CAUSE SKIN IRRITATION, EVEN A BURN. A SINGLE PROLONGED EXPOSURE IS NOT LIKELY TO RESULT IN THE MATERIAL BEING ABSORBED THROUGH SKIN IN HARMFUL AMOUNTS.

INGESTION: SINGLE DOSE ORAL TOXICITY IS CONSIDERED TO BE LOW. SMALL AMOUNTS SWALLOWED INCIDENTAL TO NORMAL HANDLING

OPERATIONS ARE NOT LIKELY TO CAUSE INJURY; SWALLOWING AMOUNTS LARGER THAN THAT MAY CAUSE INJURY.

INHALATION: A SINGLE BRIEF (MINUTES) INHALATION EXPOSURE IS NOT LIKELY TO CAUSE ADVERSE EFFECTS.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: BASED ON ANIMAL DATA, REPEATED EXPOSURES ARE NOT ANTICIPATED TO CAUSE ADDITIONAL SIGNIFICANT ADVERSE EFFECTS.

CANCER INFORMATION: NO RELEVANT INFORMATION FOUND.

TERATOLOGY (BIRTH DEFECTS): BIRTH DEFECTS ARE UNLIKELY.

EXPOSURES HAVING NO ADVERSE EFFECTS ON THE MOTHER SHOULD HAVE NO EFFECT ON THE FETUS.
REPRODUCTIVE EFFECTS: IN ANIMAL STUDIES, HAS BEEN SHOWN NOT TO INTERFERE WITH REPRODUCTION.

4. FIRST AID

EYE: IRRIGATE WITH FLOWING WATER IMMEDIATELY AND CONTINUOUSLY FOR 15 MINUTES. CONSULT MEDICAL PERSONNEL.
SKIN: WASH OFF IN FLOWING WATER OR SHOWER.
INGESTION: IF SWALLOWED, SEEK MEDICAL ATTENTION. DO NOT INDUCE VOMITING UNLESS DIRECTED TO DO SO BY MEDICAL PERSONNEL.
INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. CONSULT A PHYSICIAN.
NOTE TO PHYSICIAN: IF BURN IS PRESENT, TREAT AS ANY THERMAL BURN, AFTER DECONTAMINATION. NO SPECIFIC ANTIDOTE. SUPPORTIVE CARE.
TREATMENT BASED ON JUDGMENT OF THE PHYSICIAN IN RESPONSE TO REACTIONS OF THE PATIENT.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES
FLASH POINT: 145F, 63C
METHOD USED: SETAFLASH CLOSED CUP
AUTOIGNITION TEMPERATURE: 260C
FLAMMABILITY LIMITS
LFL: 1.1% @ 80C
UFL: 8.4% @ 145C
HAZARDOUS COMBUSTION PRODUCTS: DURING A FIRE, SMOKE MAY CONTAIN THE ORIGINAL MATERIAL IN ADDITION TO UNIDENTIFIED TOXIC AND/OR IRRITATING COMPOUNDS.
OTHER FLAMMABILITY INFORMATION: VIOLENT STEAM GENERATION OR ERUPTION MAY OCCUR UPON APPLICATION OF DIRECT WATER STREAM TO HOT LIQUIDS. SPILLS OF THESE ORGANIC LIQUIDS ON HOT FIBROUS INSULATIONS MAY LEAD TO LOWERING OF THE AUTOIGNITION TEMPERATURES POSSIBLY RESULTING IN SPONTANEOUS COMBUSTION.
EXTINGUISHING MEDIA: WATER FOG OR FINE SPRAY, CARBON DIOXIDE, DRY CHEMICAL, FOAM. ALCOHOL RESISTANT FOAMS (ATC TYPE) ARE PREFERRED IF AVAILABLE. GENERAL PURPOSE SYNTHETIC FOAMS (INCLUDING AFF) OR PROTEIN FOAMS MAY FUNCTION, BUT MUCH LESS EFFECTIVELY.
MEDIA TO BE AVOIDED: DO NOT USE DIRECT WATER STREAM.
FIRE FIGHTING INSTRUCTIONS: KEEP PEOPLE AWAY. ISOLATE FIRE AREA AND DENY UNNECESSARY ENTRY. BURNING LIQUIDS MAY BE MOVED BY FLUSHING WITH WATER TO PROTECT PERSONNEL AND MINIMIZE PROPERTY DAMAGE. AVOID ACCUMULATION OF WATER. PRODUCT MAY BE CARRIED ACROSS WATER SURFACE SPREADING FIRE OR CONTACTING AN IGNITION SOURCE. DO NOT USE DIRECT WATER STREAM. MAY SPREAD FIRE.
PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS: WEAR POSITIVE-PRESSURE SELF-CONTAINED BREATHING APPARATUS (SCBA) AND PROTECTIVE FIRE FIGHTING CLOTHING (INCLUDES FIRE FIGHTING HELMET, COAT, PANTS, BOOTS, AND GLOVES). IF PROTECTIVE EQUIPMENT IS NOT AVAILABLE OR NOT USED, FIGHT FIRE FROM A PROTECTED LOCATION OR SAFE DISTANCE.

6. ACCIDENTAL RELEASE MEASURES

(SEE SECTION 15 FOR REGULATORY INFORMATION)
PROTECT PEOPLE: ELIMINATE ALL SOURCES OF IGNITION IN VICINITY OF SPILL OR RELEASED VAPOR TO AVOID FIRE OR EXPLOSION. FOR LARGE SPILLS, WARN PUBLIC OF DOWNWIND EXPLOSION HAZARD. CHECK AREA WITH EXPLOSION METER BEFORE REENTERING AREA. GROUND AND BOND ALL CONTAINERS AND HANDLING EQUIPMENT.
PROTECT THE ENVIRONMENT: VAPOR EXPLOSION HAZARD, KEEP OUT OF SEWERS. MATERIAL MAY FLOAT ON WATER AND ANY RUNOFF MAY CREATE AN EXPLOSION OR FIRE HAZARD IF IGNITED.
CLEANUP: PUMP WITH EXPLOSION-PROOF EQUIPMENT. ABSORB WITH MATERIAL SUCH AS DIRT OR SAND. IF AVAILABLE, USE FOAM TO SMOTHER OR SUPPRESS.

7. HANDLING AND STORAGE

HANDLING: CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, CAN CONTAIN VAPORS. DO NOT CUT, DRILL, GRIND, WELD, OR PERFORM SIMILAR OPERATIONS ON OR NEAR EMPTY CONTAINERS.
STORAGE: KEEP CONTAINERS TIGHTLY CLOSED WHEN NOT IN USE. STORE

IN CARBON STEEL, STAINLESS STEEL, TEFLON.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION
ENGINEERING CONTROLS: PROVIDE GENERAL AND/OR LOCAL EXHAUST
VENTILATION TO CONTROL AIRBORNE LEVELS BELOW THE EXPOSURE
GUIDELINES.

PERSONAL PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION: USE CHEMICAL GOGGLES. IF VAPOR EXPOSURE
CAUSES EYE DISCOMFORT, USE A FULL-FACE RESPIRATOR.

SKIN PROTECTION: WHEN PROLONGED OR FREQUENTLY REPEATED CONTACT
COULD OCCUR, USE PROTECTIVE CLOTHING IMPERVIOUS TO THIS
MATERIAL. SELECTION OF SPECIFIC ITEMS SUCH AS GLOVES, BOOTS,
APRON, OR FULL-BODY SUIT WILL DEPEND ON OPERATION.

RESPIRATORY PROTECTION: ATMOSPHERIC LEVELS SHOULD BE MAINTAINED
BELOW THE EXPOSURE GUIDELINE. WHEN RESPIRATORY PROTECTION IS
REQUIRED FOR CERTAIN OPERATIONS, USE AN APPROVED AIR-PURIFYING
RESPIRATOR.

EXPOSURE GUIDELINE(S): PROPYLENE GLYCOL N-BUTYL ETHER; THE VENDOR
IHG IS 50 PPM.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE: CLEAR LIQUID.

ODOR: MILD

VAPOR PRESSURE: 0.85 MMHG @ 20C

VAPOR DENSITY: (AIR=1): 4.6

BOILING POINT: 340F, 171C

SOLUBILITY IN WATER/MISCIBILITY: 5.5 G/100G @ 25C

SPECIFIC GRAVITY OR DENSITY: 0.878 @ 25/25C

FREEZING POINT: <-80C

VOLATILE ORGANIC COMPOUNDS (VOC) CONTENT: 880 G/L OR 7.34 LB/GAL
@20C AS PER RULE 443.1 OF CALIFORNIA SCAQMD

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: STABLE UNDER RECOMMENDED STORAGE CONDITIONS.
SEE STORAGE SECTION.

CONDITIONS TO AVOID: PRODUCT CAN DECOMPOSE AT ELEVATED
TEMPERATURES.

INCOMPATIBILITY WITH OTHER MATERIALS: AVOID CONTACT WITH
OXIDIZING MATERIALS.

HAZARDOUS DECOMPOSITION PRODUCTS: DOES NOT NORMALLY DECOMPOSE.

HAZARDOUS DECOMPOSITION PRODUCTS DEPEND UPON TEMPERATURE, AIR

SUPPLY AND THE PRESENCE OF OTHER MATERIALS. HAZARDOUS

DECOMPOSITION PRODUCTS MAY INCLUDE AND ARE NOT LIMITED TO:

ALDEHYDES, KETONES, ORGANIC ACIDS.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

11. TOXICOLOGICAL INFORMATION

(SEE SECTION 3 FOR POTENTIAL HEALTH EFFECTS. FOR DETAILED TOXICOLOGICAL DATA,
WRITE OR CALL THE ADDRESS OR NON-EMERGENCY NUMBER SHOWN IN SECTION 1)

SKIN: THE LD50 FOR SKIN ABSORPTION IN RATS IS > 2000 MG/KG.

INGESTION: THE ORAL LD50 FOR RATS IS 3300 MG/KG.

MUTAGENICITY: IN VITRO MUTAGENICITY STUDIES WERE NEGATIVE.

12. ECOLOGICAL INFORMATION

(FOR DETAILED ECOLOGICAL DATA, WRITE OR CALL
THE ADDRESS OR NON-EMERGENCY NUMBER SHOWN IN SECTION 1)

ENVIRONMENTAL FATE

MOVEMENT & PARTITIONING: BIOCONCENTRATION POTENTIAL IS LOW

(BCF LESS THAN 100 OR LOG POW LESS THAN 3). LOG OCTANOL/

WATER PARTITION COEFFICIENT (LOG POW) IS ESTIMATED USING

THE POMONA-MEDCHEM STRUCTURAL FRAGMENT METHOD TO BE 0.98.

POTENTIAL FOR MOBILITY IN SOIL IS VERY HIGH (KOC BETWEEN

0 AND 50). SOIL ORGANIC CARBON/WATER PARTITION COEFFICIENT

(KOC) IS ESTIMATED TO BE 1.3 - 6.0. HENRY'S LAW CONSTANT

(H) IS ESTIMATED TO BE 3.86E-06 ATM.M3/MOLE.

DEGRADATION & PERSISTENCE: THEORETICAL OXYGEN DEMAND

(THOD) IS CALCULATED TO BE 2.42 P/P. MATERIAL IS

READILY BIODEGRADABLE. PASSES OECD TEST(S) FOR READY

BIODEGRADABILITY. BIODEGRADATION REACHED IN CO2 EVOLUTION

TEST (MODIFIED STURM TEST, OECD TEST NO. 301 B) AFTER 28

DAYS: 67%. BIODEGRADATION REACHED IN MODIFIED OECD

SCREENING TEST (OECD TEST NO. 301 E) AFTER 28 DAYS: 90%.

BIODEGRADATION REACHED IN CLOSED BOTTLE TEST (OECD TEST

NO. 301 D) AFTER 28 DAYS: 60.5%.

ECOTOXICITY: MATERIAL IS PRACTICALLY NON-TOXIC TO AQUATIC

ORGANISMS ON AN ACUTE BASIS (LC50/EC50 >100 MG/L IN MOST SENSITIVE SPECIES). ACUTE LC50 IN GUPPY (POECILIA RETICULATA) IS 560-1000 MG/L. ACUTE LC50 IN WATER FLEA (DAPHNIA MAGNA) IS > 1000 MG/L.

13. DISPOSAL CONSIDERATIONS

(SEE SECTION 15 FOR REGULATORY INFORMATION)
DISPOSAL: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. ALL DISPOSAL METHODS MUST BE IN COMPLIANCE WITH ALL FEDERAL, STATE/PROVINCIAL AND LOCAL LAWS AND REGULATIONS. REGULATIONS MAY VARY IN DIFFERENT LOCATIONS. WASTE CHARACTERIZATIONS AND COMPLIANCE WITH APPLICABLE LAWS ARE THE RESPONSIBILITY SOLELY OF THE WASTE GENERATOR. THE VENDOR HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION 2 (COMPOSITION/INFORMATION ON INGREDIENTS). FOR UNUSED & UNCONTAMINATED PRODUCT, THE PREFERRED OPTIONS INCLUDE SENDING TO A LICENSED, PERMITTED: RECYCLER, RECLAIMER, INCINERATOR OR OTHER THERMAL DESTRUCTION DEVICE.

14. TRANSPORT INFORMATION

DEPARTMENT OF TRANSPORTATION (D.O.T.): FOR DOT REGULATORY INFORMATION, IF REQUIRED, CONSULT TRANSPORTATION REGULATIONS, PRODUCT SHIPPING PAPERS OR CONTACT YOUR VENDOR REPRESENTATIVE.
CANADIAN TDG INFORMATION:
FOR TDG REGULATORY INFORMATION, IF REQUIRED, CONSULT TRANSPORTATION REGULATIONS, PRODUCT SHIPPING PAPERS, OR YOUR VENDOR REPRESENTATIVE.

15. REGULATORY INFORMATION

(NOT MEANT TO BE ALL-INCLUSIVE--SELECTED REGULATIONS REPRESENTED)
NOTICE: THE INFORMATION HEREIN IS PRESENTED IN GOOD FAITH AND BELIEVED TO BE ACCURATE AS OF THE EFFECTIVE DATE SHOWN ABOVE. HOWEVER, NO WARRANTY, EXPRESS OR IMPLIED IS GIVEN. REGULATORY REQUIREMENTS ARE SUBJECT TO CHANGE AND MAY DIFFER FROM ONE LOCATION TO ANOTHER; IT IS THE BUYER'S RESPONSIBILITY TO ENSURE THAT ITS ACTIVITIES COMPLY WITH FEDERAL, STATE OR PROVINCIAL, AND LOCAL LAWS. THE FOLLOWING SPECIFIC INFORMATION IS MADE FOR THE PURPOSE OF COMPLYING WITH NUMEROUS FEDERAL, STATE OR PROVINCIAL, AND LOCAL LAWS AND REGULATIONS. SEE OTHER SECTIONS FOR HEALTH AND SAFETY INFORMATION.
SARA 313 INFORMATION: TO THE BEST OF OUR KNOWLEDGE, THIS PRODUCT CONTAINS NO CHEMICAL SUBJECT TO SARA TITLE III SECTION 313 SUPPLIER NOTIFICATION REQUIREMENTS.

SARA HAZARD CATEGORY: THIS PRODUCT HAS BEEN REVIEWED ACCORDING TO THE EPA "HAZARD CATEGORIES" PROMULGATED UNDER SECTIONS 311 AND 312 OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA TITLE III) AND IS CONSIDERED, UNDER APPLICABLE DEFINITIONS, TO MEET THE FOLLOWING CATEGORIES:

AN IMMEDIATE HEALTH HAZARD
A FIRE HAZARD

TOXIC SUBSTANCES CONTROL ACT (TSCA):
ALL INGREDIENTS ARE ON THE TSCA INVENTORY OR ARE NOT REQUIRED TO BE LISTED ON THE TSCA INVENTORY.

THE CAS NUMBER FOR TSCA IS 005131-66-8.

STATE RIGHT-TO-KNOW: THIS PRODUCT IS NOT KNOWN TO CONTAIN ANY SUBSTANCES SUBJECT TO THE DISCLOSURE REQUIREMENTS OF NEW JERSEY PENNSYLVANIA

OSHA HAZARD COMMUNICATION STANDARD:
THIS PRODUCT IS A "HAZARDOUS CHEMICAL" AS DEFINED BY THE OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200.

CANADIAN REGULATIONS

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WHMIS INFORMATION: THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) CLASSIFICATION FOR THIS PRODUCT IS:
B3 - COMBUSTIBLE LIQUID WITH A FLASH POINT BETWEEN 37.8C AND 93.3C

D2B - EYE OR SKIN IRRITANT
REFER ELSEWHERE IN THE MSDS FOR SPECIFIC WARNINGS AND
SAFE HANDLING INFORMATION. REFER TO THE EMPLOYER'S
WORKPLACE EDUCATION PROGRAM.

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CPR STATEMENT: THIS PRODUCT HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE
HAZARD CRITERIA OF THE CANADIAN CONTROLLED PRODUCTS REGULATIONS (CPR)
AND THE MSDS CONTAINS ALL THE INFORMATION REQUIRED BY THE CPR.

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HAZARDOUS PRODUCTS ACT INFORMATION: THIS PRODUCT CONTAINS THE FOLLOWING
INGREDIENTS WHICH ARE CONTROLLED PRODUCTS AND/OR ON THE INGREDIENT
DISCLOSURE LIST (CANADIAN HPA SECTION 13 AND 14):
COMPONENTS: CAS # AMOUNT(%W/W)
PROPYLENE GLYCOL N-BUTYL ETHER
(PROPYLENE GLYCOL MONOBUTYL ETHER) 99%
2-PROPANOL-1-BUTOXY CAS# 005131-66-8
1-PROPANOL-2-BUTOXY CAS# 015821-83-7
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16. OTHER INFORMATION

THIS PRODUCT IS ALSO REGISTERED ON THE FOLLOWING INVENTORIES:
THE REGISTRY NUMBER FOR EINECS (EU) IS 249-598-7.
THE REGISTRY NUMBER FOR DSL (CANADA) IS 5131-66-8.
THE REGISTRY NUMBER FOR ECL (KOREA) IS 2-521.
THE REGISTRY NUMBER FOR MITI (JAPAN) IS 2-2424.
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

The information contained herein is based on data considered to be accurate based on the material as packaged. However, no warranty is expressed regarding the accuracy of these data or the results to be obtained from the use thereof. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It is the user's obligation to determine the conditions of safe use of the product. While this MSDS is based on technical data judged to be reliable, PHARMCO-AAPER assumes not responsibility for the completeness or accuracy of the information contained herein.