MATERIAL SAFETY DATA SHEET

SECTION I

PRODUCT: METHYL ETHYL KETONE

CHEMICAL NAME: 2-BUTANONE

CHEMICAL FAMILY: KETONE

SHS CODE: 31210

SECTION II-A

PRODUCT/INGREDIENT

NO. COMPOSITION GAS NUMBER PERCENT

P METHYL ETHYL KETONE 78-93-3 100

NFPA HAZARD RATING: HEALTH 1 FIRE 3 REACTIVITY 0

SECTION II-B

ACUTE TOXICITY DATA

NO. ACUTE ORAL LD50 ACUTE DERMAL LD50 ACUTE INHALATION LC50

P 2.9 G/KG (RAT) >5 G/KG (RABBIT) >5000 PPM/8H (RAT)

SECTION III

HEALTH INFORMATION


EYE CONTACT
LIQUID IS MILDLY IRRITATING TO THE EYES. HIGH VAPOR CONCENTRATIONS MAY ALSO BE IRRITATING.

SKIN CONTACT
LIQUID IS MODERATELY IRRITATING TO THE SKIN. PROLONGED OR REPEATED LIQUID CONTACT CAN RESULT IN DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INHALATION
VAPORS MAY CAUSE IRRITATION TO NOSE, THROAT AND RESPIRATORY TRACT. HIGH VAPOR CONCENTRATIONS MAY CAUSE CNS DEPRESSION.

INGESTION
LIQUID IS MODERATELY TOXIC AND MAY BE HARMFUL IF SWALLOWED: MAY PRODUCE CNS DEPRESSION.

SIGNS AND SYMPTOMS
IRRITATION AS NOTED ABOVE. EARLY TO MODERATE CNS (CENTRAL NERVOUS SYSTEM) DEPRESSION MAY BE EVIDENCED BY GIDDINESS, HEADACHE, DIZZINESS AND NAUSEA; IN EXTREME CASES, UNCONSCIOUSNESS AND DEATH MAY OCCUR.

Distributed by

WOBURN CHEMICAL COMPANY
2130 ENERGY PARK DRIVE
ST. PAUL, MINNESOTA 55108
612-645-9224
JCT NAME: METHYL ETHYL KETONE

AGGRAVATED MEDICAL CONDITIONS
PREEXISTING EYE, SKIN, AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

SEE SECTION VI FOR SUPPLEMENTAL INFORMATION.

SECTION IV

OCCUPATIONAL EXPOSURE LIMITS

<table>
<thead>
<tr>
<th>NO.</th>
<th>PEL/TWA OSHA PEL/CEILING</th>
<th>TLV/TWA ACGIH</th>
<th>TLV/STEL OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>200 PPM</td>
<td>200 PPM</td>
<td>300 PPM</td>
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</tbody>
</table>

*OSHA PEL/STEL.

SECTION V

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT
FLUSH SKIN WITH WATER WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. IF IRRITATION OCCURS, GET MEDICAL ATTENTION. DO NOT REUSE CLOTHING OR SHOES UNTIL CLEANED.

INHALATION
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

STATION
NOT GIVE LIQUIDS IF VICTIM IS UNCONSCIOUS OR VERY DROWSY. OTHERWISE GIVE NO MORE THAN 2 GLASSES OF WATER AND INDUCE VOMITING BY GIVING 30CC (2 TABLESPOONS) SYRUP OF IPECAC.* IF IPECAC IS UNAVAILABLE, GIVE 2 GLASSES OF WATER AND INDUCE VOMITING BY TOUCHING FINGER TO BACK OF VICTIM'S THROAT. KEEP VICTIM'S HEAD BELOW HIPS WHILE VOMITING. GET MEDICAL ATTENTION.

NOTE TO PHYSICIAN
*IF VICTIM IS A CHILD, GIVE NO MORE THAN 1 GLASS OF WATER AND 15CC (1 TABLESPOON) SYRUP OF IPECAC.
IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMESIS. GASTRIC LAVAGE SHOULD BE CONSIDERED FOLLOWING INTUBATION WITH A CUFFED ENDOTRACHEAL TUBE.

SECTION VI

SUPPLEMENTAL HEALTH INFORMATION

IN PREGNANT FEMALE RODENTS EXPOSED BY INHALATION TO HIGH CONCENTRATIONS OF METHYL ETHYL KETONE (MEK) VAPOR (15X THE OSHA - PEL/TWA) MINOR DEVELOPMENTALLY TOXIC EFFECTS TO THE FETUSES WERE OBSERVED.

MEK HAS BEEN DEMONSTRATED TO POTENTIATE (I.E. SHORTEN THE TIME OF ONSET) THE PERIPHERAL NEUROPATHY CAUSED BY EITHER N-HEXANE OR METHYL N-BUTYL KETONE. MEK BY ITSELF HAS NOT BEEN DEMONSTRATED TO CAUSE PERIPHERAL NEUROPATHY.

MEK CAN POTENTIATE THE NEUROTOXICITY OF HEXACARBON COMPOUNDS (N-HEXANE, METHYL-N-BUTYLKETONE, AND 2,5-HEXANEDIONE) AND THE LIVER AND KIDNEY TOXICITY OF HALOALKANE SOLVENTS.
PRODUCT NAME: METHYL ETHYL KETONE

SECTION VII

PHYSICAL DATA

BOILING POINT: 175
(DEG F)
SPECIFIC GRAVITY: 0.81
(H2O=1)
VAPOR PRESSURE: 70.9 (MM HG)
68 DEG. F
MELTING POINT: -124
(DEG F)
SOLUBILITY: APPRECIABLE
(IN WATER)
VAPOR DENSITY: 2.5
(AIR=1)
EVAPORATION RATE (N-BUTYL ACETATE'=1): 3.8
VOC: 100% *
6.67 LB/GAL
APPEARANCE AND ODOR:
COLORLESS, MOBILE LIQUID. PUNGENT ODOR.

SECTION VIII

FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
23 DEG. F (TCC)
FLAMMABLE LIMITS /% VOLUME IN AIR
LOWER: 1.8 UPPER: 11.5

EXTINGUISHING MEDIA
USE WATER FOG. "ALCOHOL" FOAM, DRY CHEMICAL OR CO2.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS
WARNING: FLAMMABLE. CLEAR FIRE AREA OF UNPROTECTED PERSONNEL. DO NOT ENTER CONFINED FIRE SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS). INCLUDING A POSITIVE PRESSURE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

UNUSUAL FIRE AND EXPLOSION HAZARDS
CONTAINERS EXPOSED TO INTENSE HEAT FROM FIRES SHOULD BE COOLED WITH WATER TO PREVENT VAPOR PRESSURE BUILDUP WHICH COULD RESULT IN CONTAINER RUPTURE. CONTAINER AREAS EXPOSED TO DIRECT FLAME CONTACT SHOULD BE COOLED WITH LARGE QUANTITIES OF WATER AS NEEDED TO PREVENT WEAKENING OF CONTAINER STRUCTURE.

SECTION IX

REACTIVITY

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
AVOID HEAT, SPARKS, FLAME AND CONTACT WITH STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS
CARBON MONOXIDE AND UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED DURING COMBUSTION. ONE HAZARDOUS COMBUSTION PRODUCT, METHYL VINYL KETONE HAS BEEN FOUND IN THE COMBUSTION ZONE OF A PLANT INCINERATOR BURNING WASTE MEK. THIS INFORMATION WAS SUPPLIED TO EPA UNDER FY1# OTS-0190-0661 BY HERCULES, INC.

SECTION X

EMPLOYEE PROTECTION

RESPIRATORY PROTECTION
AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. IF EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS (SEC. IV) USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134 USE EITHER A FULL-FACE, ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS.

PROTECTIVE CLOTHING
AVOID CONTACT WITH EYES. WEAR CHEMICAL GOGGLES IF THERE IS LIKELIHOOD OF CONTACT WITH EYES. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. WEAR CHEMICAL-RESISTANT GLOVES AND OTHER CLOTHING AS REQUIRED TO MINIMIZE CONTACT. TEST DATA FROM PUBLISHED LITERATURE AND/OR GLOVE AND CLOTHING-
JUICY NAME: METHYL ETHYL KETONE

ADDITIONAL PROTECTIVE MEASURES
* MANUFACTURERS INDICATE THE BEST PROTECTION IS PROVIDED BY BUTYL. USE EXPLOSION-PROOF VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS. AIR-DRY CONTAMINATED CLOTHING IN A WELL VENTILATED AREA. THEN LAUNDER BEFORE REUSING.

SECTION XI  ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES
WARNING. FLAMMABLE. ELIMINATE ALL IGNITION SOURCES. HANDLING EQUIPMENT MUST BE GROUNDED TO PREVENT SPARKING. *** LARGE SPILLS *** EVACUATE THE HAZARD AREA OF UNPROTECTED PERSONNEL. WEAR APPROPRIATE RESPIRATOR AND PROTECTIVE CLOTHING. SHUT OFF SOURCE OF LEAK ONLY IF SAFE TO DO SO. DIKE AND CONTAIN. IF VAPOR CLOUD FORMS, WATER FOG MAY BE USED TO SUPPRESS; CONTAIN RUN-OFF. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE/SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND OR OTHER SUITABLE MATERIAL; PLACE IN NON-LEAKING CONTAINERS FOR PROPER DISPOSAL. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE; DISPOSE OF FLUSH SOLUTIONS AS ABOVE. *** SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATERIAL AND PLACE IN NON-LEAKING CONTAINERS; SEAL TIGHTLY FOR PROPER DISPOSAL.

SECTION XII  SPECIAL PRECAUTIONS

KEEP LIQUID AND VAPOR AWAY FROM HEAT, SPARKS AND FLAME. SURFACES THAT ARE SUFFICIENTLY HOT MAY IGNITE EVEN LIQUID PRODUCT IN THE ABSENCE OF SPARKS OR FLAME. EXTINGUISH PILOT LIGHTS, CIGARETTES AND TURN OFF OTHER SOURCES OF IGNITION PRIOR TO USE AND UNTIL ALL VAPORS ARE GONE. VAPORS MAY ACCUMULATE AND TRAVEL TO IGNITION SOURCES DISTANT FROM THE HANDLING SITE; FLASH-FIRE CAN RESULT. KEEP CONTAINERS CLOSED WHEN NOT IN USE. USE WITH ADEQUATE VENTILATION.

CONTAINERS, EVEN THOSE THAT HAVE BEEN EMMPTED, CAN CONTAIN EXPLOSIVE VAPORS. DO NOT CUT, DRILL, OR WELD OR PERFORM SIMILAR OPERATIONS ON OR NEAR CONTAINERS. DO NOT PRESSURIZE DRUM CONTAINERS OR KNOCK THEM.

STATIC ELECTRICITY MAY ACCUMULATE AND CREATE A FIRE HAZARD. GROUND FIXED EQUIPMENT. BOND AND GROUND TRANSFER CONTAINERS AND EQUIPMENT.

WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING, APPLYING COSMETICS, OR USING TOILET FACILITIES. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. AIR-DRY CONTAMINATED CLOTHING IN A WELL VENTILATED AREA BEFORE LAUNDERING.

SECTION XIII  TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION:
CLASS 3 (FLAMMABLE LIQUIDS), II

D.O.T. PROPER SHIPPING NAME:
METHYL ETHYL KETONE (OR ETHYL METHYL KETONE)

OTHER REQUIREMENTS:
UN1193. GUIDE 26

SECTION XIV  OTHER REGULATORY CONTROLS

THIS PRODUCT IS LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES

PROTECTION OF STRATOSPHERIC OZONE (PURSUANT TO SECTION 611 OF THE CLEAN AIR ACT AMENDMENTS OF 1990): PER 40 CFR PART 82. THIS PRODUCT DOES NOT CONTAIN NOR WAS IT DIRECTLY MANUFACTURED WITH ANY CLASS I OR CLASS II OZONE DEPLETING SUBSTANCES.

IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE ENVIRONMENTAL DATA SHEET (EDS) SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS.
PRODUCT NAME: METHYL ETHYL KETONE

SECTION XV
STATE REGULATORY INFORMATION

THE FOLLOWING CHEMICALS ARE SPECIFICALLY LISTED BY INDIVIDUAL STATES; OTHER PRODUCT SPECIFIC HEALTH AND SAFETY DATA IN OTHER SECTIONS OF THE MSDS MAY ALSO BE APPLICABLE FOR STATE REQUIREMENTS. FOR DETAILS ON YOUR REGULATORY REQUIREMENTS YOU SHOULD CONTACT THE APPROPRIATE AGENCY IN YOUR STATE.

STATE LISTED COMPONENT PERCENT STATE CODE

METHYL ETHYL KETONE (CAS NO: 000078-93-3) 100 CA, FL, IL, MA, ME, MN, NJ, PA, RI

CA = CALIFORNIA HAZ. SUBST. LIST; CAG6C, CAGSR, CAG6C/R = CALIFORNIA SAFE DRINKING WATER AND TOXICS ENFORCEMENT ACT OF 1986 OR PROPOSITION 65 LIST; CT = CONNECTICUT TOXIC. SUBST. LIST; FL = FLORIDA SUBST. LIST; IL = ILLINOIS TOX. SUBST. LIST; LA = LOUISIANA HAZ. SUBST. LIST; MA = MASSACHUSETTS SUBST. LIST; ME = MAINE HAZ. SUBST. LIST; MN = MINNESOTA HAZ. SUBST. LIST; NJ = NEW JERSEY HAZ. SUBST. LIST; PA = PENNSYLVANIA HAZ. SUBST. LIST; RI = RHODE ISLAND HAZ. SUBST. LIST.

SECTION XVI
SPECIAL NOTES

THIS MSDS REVISION HAS CHANGES IN SECTIONS II, III AND VI. A SPANISH TRANSLATION OF THIS MSDS MAY BE OBTAINED BY CALLING 1-800-240-MSDS.

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

DATE PREPARED: FEBRUARY 01, 1996

BE SAFE
READ OUR PRODUCT SAFETY INFORMATION ... AND PASS IT ON (PRODUCT LIABILITY LAW REQUIRES IT)

J. C. WILLETT
SHELL OIL COMPANY
PRODUCT SAFETY AND COMPLIANCE
P. O. BOX 4320
HOUSTON, TX 77210