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SAFETY DATA SHEET

SECTION 1. CHEMICAL IDENTIFICATION

| | |
|---------------------------------|---|
| CATALOG #: | 34463 |
| NAME: | Isovaleric acid |
| SYNONYMS: | 3-Methylbutanoic acid Isopentanoic acid |
| 24 HOUR EMERGENCY TELEPHONE: | (800) 535-5053(USA) 352-323-3500 (INTERNATIONAL) |
| TO REQUEST AN MSDS: | (800) 869-9290 |
| CUSTOMER SERVICE: | (630) 766-2112 |

SECTION 2. HAZARDS IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

GHS CLASSIFICATION IN ACCORDANCE WITH 29 CFR 1910 (OSHA HCS)
FLAMMABLE LIQUIDS (CATEGORY 4), H227

SKIN CORROSION (CATEGORY 1B), H314
SERIOUS EYE DAMAGE (CATEGORY 1), H318

FOR THE FULL TEXT OF THE H-STATEMENTS MENTIONED IN THIS SECTION, SEE SECTION 16.

**GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS
PICTOGRAM**



SIGNAL WORD DANGER

HAZARD STATEMENT(S)

H227 COMBUSTIBLE LIQUID.
H314 CAUSES SEVERE SKIN BURNS AND EYE DAMAGE.
H318 CAUSES SERIOUS EYE DAMAGE.

PRECAUTIONARY STATEMENT(S)

P210 KEEP AWAY FROM HEAT/SPARKS/OPEN FLAMES/HOT SURFACES. NO SMOKING.
P264 WASH SKIN THOROUGHLY AFTER HANDLING.
P280 WEAR PROTECTIVE GLOVES/ PROTECTIVE CLOTHING/ EYE PROTECTION/ FACE PROTECTION.
P301 + P330 + P331 IF SWALLOWED: RINSE MOUTH. DO NOT INDUCE VOMITING.
P303 + P361 + P353 IF ON SKIN (OR HAIR): REMOVE/ TAKE OFF IMMEDIATELY ALL CONTAMINATED CLOTHING. RINSE SKIN WITH WATER/ SHOWER.
P304 + P340 + P310 IF INHALED: REMOVE PERSON TO FRESH AIR AND KEEP COMFORTABLE FOR BREATHING. IMMEDIATELY CALL A POISON CENTER/DOCTOR.
P305 + P351 + P338 + P310 IF IN EYES: RINSE CAUTIOUSLY WITH WATER FOR SEVERAL MINUTES. REMOVE CONTACT LENSES, IF PRESENT AND EASY TO DO. CONTINUE RINSING. IMMEDIATELY CALL A POISON CENTER/DOCTOR.
P363 WASH CONTAMINATED CLOTHING BEFORE REUSE.
P370 + P378 IN CASE OF FIRE: USE DRY SAND, DRY CHEMICAL OR ALCOHOL-RESISTANT FOAM TO EXTINGUISH.
P403 + P235 STORE IN A WELL-VENTILATED PLACE. KEEP COOL.
P405 STORE LOCKED UP.
P501 DISPOSE OF CONTENTS/ CONTAINER TO AN APPROVED WASTE DISPOSAL PLANT.

HAZARDS NOT OTHERWISE CLASSIFIED (HNOC) OR NOT COVERED BY GHS NONE

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MF: C₅H₁₀O₂
 MW: 102.13
 CAS-NO. 503-74-2
 PURITY: 99 - 100% (GC)

HAZARDOUS COMPONENTS

| COMPONENT | CLASSIFICATION | CONCENTRATION |
|------------------------|--|---------------|
| Isovaleric acid | | |
| | FLAM. LIQ. 4; SKIN CORR. 1B; EYE DAM. 1; AQUATIC ACUTE 3; H227, H314, H318, H402 | <= 100 % |

FOR THE FULL TEXT OF THE H-STATEMENTS MENTIONED IN THIS SECTION, SEE SECTION 16.

SECTION 4. FIRST-AID MEASURES

DESCRIPTION OF FIRST AID MEASURES

| | |
|--|--|
| GENERAL ADVICE | CONSULT A PHYSICIAN. SHOW THIS SAFETY DATA SHEET TO THE DOCTOR IN ATTENDANCE.MOVE OUT OF DANGEROUS AREA. |
| IF INHALED | IF BREATHED IN, MOVE PERSON INTO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. CONSULT A PHYSICIAN. |
| IN CASE OF SKIN CONTACT | TAKE OFF CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH OFF WITH SOAP AND PLENTY OF WATER. CONSULT A PHYSICIAN. |
| IN CASE OF EYE CONTACT | RINSE THOROUGHLY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES AND CONSULT A PHYSICIAN. CONTINUE RINSING EYES DURING TRANSPORT TO HOSPITAL. |
| IF SWALLOWED | DO NOT INDUCE VOMITING. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. RINSE MOUTH WITH WATER. CONSULT A PHYSICIAN. |
| MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED | THE MOST IMPORTANT KNOWN SYMPTOMS AND EFFECTS ARE DESCRIBED IN THE LABELLING (SEE SECTION 2.2) AND/OR IN SECTION 11 |
| INDICATION OF ANY IMMEDIATE MEDICAL | NO DATA AVAILABLE |

**ATTENTION AND
SPECIAL TREATMENT
NEEDED**

SECTION 5. FIRE AND EXPLOSION DATA

EXTINGUISHING MEDIA

**SUITABLE
EXTINGUISHING MEDIA** USE WATER SPRAY, ALCOHOL-RESISTANT FOAM, DRY
CHEMICAL OR CARBON DIOXIDE.

**SPECIAL HAZARDS
ARISING FROM THE
SUBSTANCE OR MIXTURE** CARBON OXIDES

**ADVICE FOR
FIREFIGHTERS** WEAR SELF CONTAINED BREATHING APPARATUS FOR
FIRE FIGHTING IF NECESSARY.

FURTHER INFORMATION USE WATER SPRAY TO COOL UNOPENED CONTAINERS.

SECTION 6. ACCIDENTAL RELEASE MEASURES

**PERSONAL
PRECAUTIONS,
PROTECTIVE
EQUIPMENT AND
EMERGENCY
PROCEDURES** USE PERSONAL PROTECTIVE EQUIPMENT. AVOID
BREATHING VAPORS, MIST OR GAS. ENSURE
ADEQUATE VENTILATION. REMOVE ALL SOURCES OF
IGNITION. EVACUATE PERSONNEL TO SAFE AREAS.
BEWARE OF VAPORS ACCUMULATING TO FORM
EXPLOSIVE CONCENTRATIONS. VAPORS CAN
ACCUMULATE IN LOW AREAS.
FOR PERSONAL PROTECTION SEE SECTION 8

**ENVIRONMENTAL
PRECAUTIONS** PREVENT FURTHER LEAKAGE OR SPILLAGE IF SAFE
TO DO SO. DO NOT LET PRODUCT ENTER DRAINS.

**METHODS AND
MATERIALS FOR
CONTAINMENT AND
CLEANING UP** CONTAIN SPILLAGE, AND THEN COLLECT WITH AN
ELECTRICALLY PROTECTED VACUUM CLEANER OR BY
WET BRUSHING AND PLACE IN CONTAINER FOR
DISPOSAL ACCORDING TO LOCAL REGULATIONS (SEE
SECTION 13). KEEP IN SUITABLE, CLOSED CONTAINERS
FOR DISPOSAL.

**REFERENCE TO OTHER
SECTIONS** FOR DISPOSAL SEE SECTION 13.

SECTION 7. HANDLING AND STORAGE

| | |
|---|---|
| PRECAUTIONS FOR SAFE HANDLING | AVOID INHALATION OF VAPOR OR MIST. KEEP AWAY FROM SOURCES OF IGNITION - NO SMOKING. TAKE MEASURES TO PREVENT THE BUILD UP OF ELECTROSTATIC CHARGE. FOR PRECAUTIONS SEE SECTION 2.2. |
| CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES | KEEP CONTAINER TIGHTLY CLOSED IN A DRY AND WELL-VENTILATED PLACE. CONTAINERS WHICH ARE OPENED MUST BE CAREFULLY RESEALED AND KEPT UPRIGHT TO PREVENT LEAKAGE. Store at RT |
| SPECIFIC END USE(S) | APART FROM THE USES MENTIONED IN SECTION 1.2 NO OTHER SPECIFIC USES ARE STIPULATED. |

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CONTROL PARAMETERS

COMPONENTS WITH WORKPLACE CONTROL PARAMETERS

CONTAINS NO SUBSTANCES WITH OCCUPATIONAL EXPOSURE LIMIT VALUES.

EXPOSURE CONTROLS

APPROPRIATE ENGINEERING CONTROLS

HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICE. WASH HANDS BEFORE BREAKS AND AT THE END OF WORKDAY.

PERSONAL PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION

TIGHTLY FITTING SAFETY GOGGLES. FACESHIELD (8-INCH MINIMUM). USE EQUIPMENT FOR EYE PROTECTION TESTED AND APPROVED UNDER APPROPRIATE GOVERNMENT STANDARDS SUCH AS NIOSH (US) OR EN 166(EU).

SKIN PROTECTION

HANDLE WITH GLOVES. GLOVES MUST BE INSPECTED PRIOR TO USE. USE PROPER GLOVE REMOVAL TECHNIQUE (WITHOUT TOUCHING GLOVE'S OUTER SURFACE) TO AVOID SKIN CONTACT WITH THIS PRODUCT. DISPOSE OF CONTAMINATED GLOVES AFTER USE IN ACCORDANCE WITH APPLICABLE LAWS AND GOOD LABORATORY PRACTICES. WASH AND DRY HANDS.

| | |
|--|---|
| BODY PROTECTION | COMPLETE SUIT PROTECTING AGAINST CHEMICALS, THE TYPE OF PROTECTIVE EQUIPMENT MUST BE SELECTED ACCORDING TO THE CONCENTRATION AND AMOUNT OF THE DANGEROUS SUBSTANCE AT THE SPECIFIC WORKPLACE. |
| RESPIRATORY PROTECTION | WHERE RISK ASSESSMENT SHOWS AIR-PURIFYING RESPIRATORS ARE APPROPRIATE USE A FULL FACE RESPIRATOR WITH MULTI-PURPOSE COMBINATION (US) OR TYPE ABEK (EN 14387) RESPIRATOR CARTRIDGES AS A BACKUP TO ENGINEERING CONTROLS. IF THE RESPIRATOR IS THE SOLE MEANS OF PROTECTION, USE A FULL-FACE SUPPLIED AIR RESPIRATOR. USE RESPIRATORS AND COMPONENTS TESTED AND APPROVED UNDER APPROPRIATE GOVERNMENT STANDARDS SUCH AS NIOSH (US) OR CEN (EU). |
| CONTROL OF ENVIRONMENTAL EXPOSURE | PREVENT FURTHER LEAKAGE OR SPILLAGE IF SAFE TO DO SO. DO NOT LET PRODUCT ENTER DRAINS. |

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

| | |
|--|---------------------------------|
| APPEARANCE | Colorless to pale yellow liquid |
| ODOUR | NO DATA AVAILABLE |
| ODOUR THRESHOLD | NO DATA AVAILABLE |
| PH | NO DATA AVAILABLE |
| MELTING POINT/FREEZING POINT | |
| INITIAL BOILING POINT AND BOILING RANGE | 175 - 177 °C |
| FLASH POINT | 70 °C |
| EVAPORATION RATE | NO DATA AVAILABLE |
| FLAMMABILITY (SOLID, GAS) | NO DATA AVAILABLE |
| UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS | NO DATA AVAILABLE |
| VAPOUR PRESSURE | 0.507 HPA AT 20 °C |
| VAPOUR DENSITY | NO DATA AVAILABLE |
| RELATIVE DENSITY | 0.93 |
| WATER SOLUBILITY | NO DATA AVAILABLE |
| PARTITION COEFFICIENT: N- OCTANOL/WATER | NO DATA AVAILABLE |
| AUTO-IGNITION TEMPERATURE | NO DATA AVAILABLE |
| DECOMPOSITION TEMPERATURE | NO DATA AVAILABLE |
| VISCOSITY | NO DATA AVAILABLE |
| EXPLOSIVE PROPERTIES | NO DATA AVAILABLE |

OXIDIZING PROPERTIES NO DATA AVAILABLE

OTHER SAFETY INFORMATION NO DATA AVAILABLE

SECTION 10. STABILITY AND REACTIVITY

REACTIVITY NO DATA AVAILABLE

CHEMICAL STABILITY STABLE UNDER RECOMMENDED STORAGE CONDITIONS.

POSSIBILITY OF HAZARDOUS REACTIONS NO DATA AVAILABLE

CONDITIONS TO AVOID HEAT, FLAMES AND SPARKS.

INCOMPATIBLE MATERIALS BASES, OXIDIZING AGENTS, REDUCING AGENTS

HAZARDOUS DECOMPOSITION PRODUCTS HAZARDOUS DECOMPOSITION PRODUCTS FORMED UNDER FIRE CONDITIONS. - CARBON OXIDES
OTHER DECOMPOSITION PRODUCTS - NO DATA AVAILABLE
IN THE EVENT OF FIRE: SEE SECTION 5

SECTION 11. TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

ACUTE TOXICITY LD50 ORAL - RAT - MALE AND FEMALE - 2,500 MG/KG
LD50 ORAL - RAT - > 2,000 MG/KG

LC0 INHALATION - RAT - 4 H - 2.48 MG/L
INHALATION : MATERIAL IS EXTREMELY DESTRUCTIVE TO THE TISSUE OF THE MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT. CORROSIVE TO RESPIRATORY SYSTEM.

DERMAL : NO DATA AVAILABLE

NO DATA AVAILABLE

SKIN CORROSION/IRRITATION SKIN - RABBIT
RESULT: CORROSIVE - 3 MIN - 1 H

| | |
|---|--|
| SERIOUS EYE DAMAGE/EYE IRRITATION | CAUSES SERIOUS EYE DAMAGE. RISK OF BLINDNESS! |
| RESPIRATORY OR SKIN SENSITISATION | NO DATA AVAILABLE |
| GERM CELL MUTAGENICITY | OECD TEST GUIDELINE 474 MOUSE - MALE AND FEMALE - RED BLOOD CELLS (ERYTHROCYTES) RESULT: NEGATIVE (IN ANALOGY TO SIMILAR PRODUCTS) |
| CARCINOGENICITY | |
| IARC: | NO COMPONENT OF THIS PRODUCT PRESENT AT LEVELS GREATER THAN OR EQUAL TO 0.1% IS IDENTIFIED AS PROBABLE, POSSIBLE OR CONFIRMED HUMAN CARCINOGEN BY IARC. |
| ACGIH: | NO COMPONENT OF THIS PRODUCT PRESENT AT LEVELS GREATER THAN OR EQUAL TO 0.1% IS IDENTIFIED AS A CARCINOGEN OR POTENTIAL CARCINOGEN BY ACGIH. |
| NTP: | NO COMPONENT OF THIS PRODUCT PRESENT AT LEVELS GREATER THAN OR EQUAL TO 0.1% IS IDENTIFIED AS A KNOWN OR ANTICIPATED CARCINOGEN BY NTP. |
| OSHA: | NO COMPONENT OF THIS PRODUCT PRESENT AT LEVELS GREATER THAN OR EQUAL TO 0.1% IS ON OSHA S LIST OF REGULATED CARCINOGENS. |
| REPRODUCTIVE TOXICITY | NO DATA AVAILABLE |
| SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE | ACUTE ORAL TOXICITY - IF INGESTED, SEVERE BURNS OF THE MOUTH AND THROAT, AS WELL AS A DANGER OF PERFORATION OF THE OESOPHAGUS AND THE STOMACH. ACUTE INHALATION TOXICITY - MUCOSAL IRRITATIONS, COUGH, SHORTNESS OF BREATH, POSSIBLE DAMAGES:, DAMAGE OF RESPIRATORY TRACT. |
| SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE | NO DATA AVAILABLE |
| ASPIRATION HAZARD | NO DATA AVAILABLE |

**ADDITIONAL
INFORMATION**

REPEATED DOSE TOXICITY - RAT - MALE - ORAL - NO
OBSERVED ADVERSE EFFECT LEVEL - 4,100 MG/KG
(IN ANALOGY TO SIMILAR PRODUCTS)

RTECS: NY1400000

MATERIAL IS EXTREMELY DESTRUCTIVE TO TISSUE
OF THE MUCOUS MEMBRANES AND UPPER
RESPIRATORY TRACT, EYES, AND SKIN. INHALATION
MAY PROVOKE THE FOLLOWING SYMPTOMS :
SPASM, INFLAMMATION AND EDEMA OF THE
BRONCHI, SPASM, INFLAMMATION AND EDEMA OF
THE LARYNX, PNEUMONITIS, PULMONARY EDEMA,
SYMPTOMS AND SIGNS OF POISONING ARE :
BURNING SENSATION, COUGH, WHEEZING,
LARYNGITIS, SHORTNESS OF BREATH, HEADACHE,
NAUSEA, VOMITING TO THE BEST OF OUR
KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND
TOXICOLOGICAL PROPERTIES HAVE NOT BEEN
THOROUGHLY INVESTIGATED.

OTHER DANGEROUS PROPERTIES CAN NOT BE
EXCLUDED.

HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL
HYGIENE AND SAFETY PRACTICE.

SECTION 12. ECOLOGICAL INFORMATION

TOXICITY

TOXICITY TO FISH

STATIC TEST LC50 - PIMEPHALES PROMELAS
(FATHEAD MINNOW) - 77 MG/L - 96 H

REMARKS: (IN ANALOGY TO SIMILAR PRODUCTS)

**TOXICITY TO DAPHNIA AND
OTHER AQUATIC
INVERTEBRATES**

STATIC TEST EC50 - DAPHNIA MAGNA (WATER FLEA) -
51.25 MG/L - 48 H

REMARKS: (IN ANALOGY TO SIMILAR PRODUCTS)

TOXICITY TO ALGAE

STATIC TEST ERC50 - PSEUDOKIRCHNERIELLA
SUBCAPITATA - 29.3 MG/L - 72 H

REMARKS: (IN ANALOGY TO SIMILAR PRODUCTS)

STATIC TEST NOEC - PSEUDOKIRCHNERIELLA
SUBCAPITATA - 6.38 MG/L - 72 H

REMARKS: (IN ANALOGY TO SIMILAR PRODUCTS)

TOXICITY TO BACTERIA STATIC TEST IC50 - TETRAHYMENA PYRIFORMIS - 224
MG/L - 40 H
REMARKS: (ECHA)

FERMENTATION TUBE TEST EC0 - ACTIVATED
SLUDGE - > 1,000 MG/L
REMARKS: (EXTERNAL MSDS)

PERSISTENCE AND DEGRADABILITY

BIODEGRADABILITY AEROBIC - EXPOSURE TIME 10 D
RESULT: 58 - 66 % - READILY BIODEGRADABLE.

BIOACCUMULATIVE
POTENTIAL NO DATA AVAILABLE

MOBILITY IN SOIL NO DATA AVAILABLE

RESULTS OF PBT AND
VPVB ASSESSMENT PBT/VPVB ASSESSMENT NOT AVAILABLE AS
CHEMICAL SAFETY ASSESSMENT NOT
REQUIRED/NOT CONDUCTED

OTHER ADVERSE EFFECTS DISCHARGE INTO THE ENVIRONMENT MUST BE
AVOIDED.

SECTION 13. DISPOSAL CONSIDERATIONS

WASTE TREATMENT METHODS

PRODUCT THIS COMBUSTIBLE MATERIAL MAY BE BURNED IN A
CHEMICAL INCINERATOR EQUIPPED WITH AN
AFTERBURNER AND SCRUBBER. OFFER SURPLUS AND
NON-RECYCLABLE SOLUTIONS TO A LICENSED
DISPOSAL COMPANY. CONTACT A LICENSED
PROFESSIONAL WASTE DISPOSAL SERVICE TO DISPOSE
OF THIS MATERIAL.

**CONTAMINATED
PACKAGING** DISPOSE OF AS UNUSED PRODUCT.

SECTION 14. TRANSPORT INFORMATION

DOT (US)
PROPER SHIPPING NAME: CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
(Isovaleric acid)
UN NUMBER: 3265
CLASS: 8

PACKING GROUP: II
REPORTABLE QUANTITY
(RQ):
POISON INHALATION HAZARD: NO

IMDG

PROPER SHIPPING NAME: CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
(Isovaleric acid)
UN NUMBER: 3265
CLASS: 8
PACKING GROUP: II
EMS-NO: F-A, S-B

IATA

PROPER SHIPPING NAME: CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
(Isovaleric acid)
UN NUMBER: 3265
CLASS: 8
PACKING GROUP: II

SECTION 15. REGULATORY INFORMATION

SARA 302 COMPONENTS NO CHEMICALS IN THIS MATERIAL ARE SUBJECT TO THE REPORTING REQUIREMENTS OF SARA TITLE III, SECTION 302.

SARA 313 COMPONENTS THIS MATERIAL DOES NOT CONTAIN ANY CHEMICAL COMPONENTS WITH KNOWN CAS NUMBERS THAT EXCEED THE THRESHOLD (DE MINIMIS) REPORTING LEVELS ESTABLISHED BY SARA TITLE III, SECTION 313.

SARA 311/312 HAZARDS

FIRE HAZARD, ACUTE HEALTH HAZARD

MASSACHUSETTS RIGHT TO KNOW COMPONENTS

| | CAS-NO. | REVISION DATE |
|-----------------|----------|---------------|
| Isovaleric acid | 503-74-2 | |

PENNSYLVANIA RIGHT TO KNOW COMPONENTS

| | CAS-NO. | REVISION DATE |
|-----------------|----------|---------------|
| Isovaleric acid | 503-74-2 | |

NEW JERSEY RIGHT TO KNOW COMPONENTS

| | CAS-NO. | REVISION DATE |
|-----------------|----------|---------------|
| Isovaleric acid | 503-74-2 | |

CALIFORNIA PROP. 65 COMPONENTS

THIS PRODUCT DOES NOT CONTAIN ANY CHEMICALS KNOWN TO STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS, OR ANY OTHER REPRODUCTIVE HARM.

SECTION 16. OTHER INFORMATION

FULL TEXT OF H-STATEMENTS REFERRED TO UNDER SECTIONS 2 AND 3.

| | |
|------|--|
| H227 | COMBUSTIBLE LIQUID. |
| H314 | CAUSES SEVERE SKIN BURNS AND EYE DAMAGE. |
| H318 | CAUSES SERIOUS EYE DAMAGE. |

MSDS LEGEND

| | |
|--------|--|
| MW: | MOLECULAR WEIGHT |
| MF: | MOLECULAR FORMULA |
| VOC: | VOLATILE ORGANIC COMPOUNDS |
| ACGIH: | AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGINISTS |
| CAS: | CHEMICAL ABSTRACTS SERIVE REGISTRY NUMBER |
| OSHA: | OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION |
| PEL: | PERMISSIBLE EXPOSURE LIMIT (OSHA) |
| TLV: | THRESHOLD LIMIT VALUE (ACGIH) |

IMPORTANT:

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