**Toluene**

Technical Data Sheet (TDS)

- **Chemical formula:** C₆H₅CH₃
- **CAS:** 108-88-3
- **RTECS:** XS5250000
- **EINECS:** 203-625-9
- **GOST 9880**
- **Appearance:** Toluene is a colorless liquid without sediment.

**Synonyms:** Methacide; Methylbenzene; Phenylmethane; Antisal la; Benzene, methyl-; Methane, phenyl-; Methylbenzol; Tolu-Sol; Toluene; Toluen; Toluene; Tolueno; Toluo; Toluolo.

**PHYSICAL AND CHEMICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene content (wt, min)</td>
<td>99.2 %</td>
</tr>
<tr>
<td>Molecular weight:</td>
<td>92.14 g/mol</td>
</tr>
<tr>
<td>Density (20 °C):</td>
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<tr>
<td>Melting point:</td>
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<tr>
<td>Boiling point:</td>
<td>110.62 °C</td>
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<tr>
<td>Flash point:</td>
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</tr>
<tr>
<td>Autoignition temp.:</td>
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</tr>
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</table>

**TOXICOLOGICAL DATA**

LD 50 (oral, rat): 7530 mg/kg

**TRANSPORT/STORAGE**

CLASS 3: Flammable liquid; Toluene UNNA: 1294 PG: II

**APPLICATION AREAS**

Toluene is used as a feedstock for a number of chemical syntheses including production of TDA, TDI, DNT, TNT, benzene and xylene. Toluene is also used as a component of solvents in paint and lacquer industry and as an octane enhancing component of gasoline.

www.zaryachem.com

Manufactured by:
Research and Production Enterprise “Zarya”, Ltd.
Zavodskaya Street, 1g/36, Rubezhnoye,
Lugansk reg., Ukraine, 93001
Phone: +380 (6453) 95085, 95026, 95035
Fax: +380 (6453) 95042, 95026, 95035

**Version:** English
**Issue:** 02
**Date:** August 2012
**Technical Data Sheet Toluene**

Issue 02 – August 2012
1/1
Material Safety Data Sheet
Toluene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Toluene
Catalog Codes: SLT2857, SLT3277
CAS#: 108-88-3
RTECS: XS5250000
TSCA: TSCA 8(b) inventory: Toluene
CI#: Not available.
Synonym: Toluol, Tolu-Sol; Methylbenzene; Methacide; Phenylmethane; Methylbenzol
Chemical Name: Toluene
Chemical Formula: C6-H5-CH3 or C7-H8

Contact Information:
Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396
US Sales: 1-800-901-7247
International Sales: 1-281-441-4400
Order Online: ScienceLab.com
CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300
International CHEMTREC, call: 1-703-527-3887
For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS #</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
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<td>100</td>
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</table>

Toxicological Data on Ingredients: Toluene: ORAL (LD50): Acute: 636 mg/kg [Rat], DERMAL (LD50): Acute: 14100 mg/kg [Rabbit]. VAPOR (LC50): Acute: 49000 mg/m 4 hours [Rat]. 440 ppm 24 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, the nervous system, liver, brain, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures
Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

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Section 5: Fire and Explosion Data

- **Flammability of the Product:** Flammable.
- **Auto-Ignition Temperature:** 480°C (896°F)
- **Flash Points:** CLOSED CUP: 44.44°C (40°F). (Setalack) OPEN CUP: 16°C (60.8°F).
- **Flammable Limits:** LOWER: 1.1% UPPER: 7.1%
- **Products of Combustion:** These products are carbon oxides (CO, CO2).
- **Fire Hazards in Presence of Various Substances:** Flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.
- **Explosion Hazards in Presence of Various Substances:** Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.
- **Fire Fighting Media and Instructions:** Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog.
- **Special Remarks on Fire Hazards:** Not available.
- **Special Remarks on Explosion Hazards:** Toluene forms explosive reaction with 1,3-dichloro-5,5-dimethyl-2,4-imidazolididione; dinitrogen tetraoxide; concentrated nitric acid, sulfuric acid + nitric acid; N2O4; AgClO4; BrF3; Uranium hexafluoride; sulfur dichloride. Also forms an explosive mixture with tetranitromethane.

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Section 6: Accidental Release Measures

- **Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.
Large Spill:
Toxic flammable liquid, insoluble or very slightly soluble in water. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.
Odor: Sweet, pungent, Benzene-like.
Taste: Not available.
Molecular Weight: 92.14 g/mole
Color: Colorless.

pH (1% soln/water): Not applicable.

Boiling Point: 110.6°C (231.1°F)
Melting Point: -95°C (-139°F)
Critical Temperature: 318.6°C (605.5°F)
Specific Gravity: 0.8636 (Water = 1)
Vapor Pressure: 3.8 kPa (@ 25°C)
Vapor Density: 3.1 (Air = 1)
Volatility: Not available.
Odor Threshold: 1.6 ppm
Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 2.7
Ionicity (in Water): Not available.
Dispersion Properties: See solubility in water, diethyl ether, acetone.
Solubility: Soluble in diethyl ether, acetone. Practically insoluble in cold water. Soluble in ethanol, benzene, chloroform, glacial acetic acid, carbon disulfide. Solubility in water: 0.561 g/l @ 25 deg. C.

**Section 10: Stability and Reactivity Data**

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Heat, ignition sources (flames, sparks, static), incompatible materials

**Incompatibility with various substances:** Reactive with oxidizing agents.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Incompatible with strong oxidizers, silver perchlorate, sodium difluoride, Tetranitromethane, Uranium Hexafluoride. Frozen Bromine Trifluoride reacts violently with Toluene at -80 deg. C. Reacts chemically with nitrogen oxides, or halogens to form nitrotoluene, nitrobenzene, and nitrophenol and halogenated products, respectively.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

**Section 11: Toxicological Information**

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:**
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 636 mg/kg [Rat]. Acute dermal toxicity (LD50): 14100 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 440 24 hours [Mouse].

**Chronic Effects on Humans:**
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: blood, kidneys, the nervous system, liver, brain, central nervous system (CNS).

**Other Toxic Effects on Humans:**
Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

**Special Remarks on Toxicity to Animals:**
Lowest Published Lethal Dose: LDL [Human] - Route: Oral; Dose: 50 mg/kg LCL [Rabbit] - Route: Inhalation; Dose: 55000 ppm/40min

**Special Remarks on Chronic Effects on Humans:**
Detected in maternal milk in human. Passes through the placental barrier in human. Embryotoxic and/or foetotoxic in animal. May cause adverse reproductive effects and birth defects (teratogenic). May affect genetic material (mutagenic)

**Special Remarks on other Toxic Effects on Humans:**
Acute Potential Health Effects: Skin: Causes mild to moderate skin irritation. It can be absorbed to some extent through the skin. Eyes: Causes mild to moderate eye irritation with a burning sensation. Splash contact with eyes also causes conjunctivitis, blepharospasm, corneal edema, corneal abrasions. This usually resolves in 2 days. Inhalation: Inhalation of vapor may cause respiratory tract irritation causing coughing and wheezing, and nasal discharge. Inhalation of high concentrations may affect behavior and cause central nervous system effects characterized by nausea, headache, dizziness, tremors, restlessness, lightheadedness, exhilaration, memory loss, insomnia, impaired reaction time, drowsiness, ataxia, hallucinations, somnolence, muscle contraction or spasticity, unconsciousness and coma. Inhalation of high concentration of vapor may also affect the cardiovascular system (rapid heart beat, heart palpitations, increased or decreased blood pressure, dysrhythmia, ), respiration (acute pulmonary edema, respiratory depression, apnea, asphyxia), cause vision disturbances and dilated pupils, and cause loss of appetite. Ingestion: Aspiration hazard. Aspiration of Toluene into the lungs may cause chemical pneumonitis. May cause irritation of the digestive tract with nausea, vomiting, pain. May have effects similar to that of acute inhalation. Chronic Potential Health Effects: Inhalation and Ingestion: Prolonged or repeated exposure via inhalation may cause central nervous system and cardiovascular symptoms similar to that of acute inhalation and ingestion as well liver damage/failure, kidney damage/failure (with hematuria, proteinuria, oliguria, renal tubular acidosis), brain damage, weight loss, blood (pigmented or nucleated red blood cells, changes in white blood cell count), bone marrow changes, electrolyte imbalances (Hypokalemia, Hypophoshatemia), severe, muscle weakness and Rhabdomyolysis. Skin: Repeated or prolonged skin contact may cause defatting dermatitis.

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 313 mg/l 48 hours [Daphnia (daphnia)]. 17 mg/l 24 hours [Fish (Blue Gill)]. 13 mg/l 96 hours [Fish (Blue Gill)]. 56 mg/l 24 hours [Fish (Fathead minnow)]. 34 mg/l 96 hours [Fish (Fathead minnow)]. 56.8 ppm any hours [Fish (Goldfish)].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.
Identification: : Toluene UNNA: 1294 PG: II
Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Toluene California prop. 65 (no significant risk level): Toluene: 7 mg/day (value) California prop. 65 (acceptable daily intake level): Toluene: 7 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Toluene Connecticut hazardous material survey.: Toluene Illinois

Other Regulations:

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):

HMIS (U.S.A.):

Health Hazard: 2
Fire Hazard: 3
Reactivity: 0
Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2
Flammability: 3
Reactivity: 0
Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.
Other Special Considerations: Not available.
Created: 10/10/2005 08:30 PM
Last Updated: 05/21/2013 12:00 PM

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1. ***Product Identification***

**Synonyms:** Acetic acid ethyl ester; Acetic ether; Acetoxyethane; Ethyl Acetic Ester; Ethyl ethanoate

**CAS No.:** 141-78-6

**Molecular Weight:** 88

**Chemical Formula:** \( \text{CH}_3\text{COOC}_2\text{H}_5 \)

2. ***Composition/Information on Ingredients***

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<tr>
<th>Ingredient</th>
<th>CAS No</th>
<th>Percent</th>
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3. ***Hazards Identification***

**Emergency Overview**

WARNING! FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED OR INHALED. AFFECTS CENTRAL NERVOUS SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

- Health Rating: 2 - Moderate (Life)
- Flammability Rating: 3 - Severe (Flammable)
- Reactivity Rating: 1 - Slight
- Contact Rating: 2 - Moderate
- Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
- Storage Color Code: Red (Flammable)

**Potential Health Effects**

**Inhalation:**
Inhalation can cause severe irritation of mucous membranes and upper respiratory tract. Symptoms may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting. High concentrations may cause lung damage. An irritant to the nose, throat, and upper respiratory tract. Exposure to high concentrations have a narcotic effect and may cause liver and kidney damage.
**Ingestion:**
Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.

**Skin Contact:**
Causes irritation to skin. Symptoms include redness, itching, and pain. Repeated or prolonged contact with the skin has a defattening effect and may cause dryness, cracking, and possibly dermatitis.

**Eye Contact:**
Causes irritation, redness, and pain.

**Chronic Exposure:**
Chronic overexposure may cause anemia with leukocytosis (transient increase in the white blood cell count) and damage to the liver and kidneys.

**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

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### 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Ingestion:**
Give large amounts of water to drink. Never give anything by mouth to an unconscious person. Get medical attention.

**Skin Contact:**
Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

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### 5. Fire Fighting Measures

**Fire:**
Flash point: -4°C (25°F) CC
Autoignition temperature: 426°C (799°F)
Flammable limits in air % by volume:
lel: 2.0; uel: 11.5
Flammable Liquid and Vapor! Contact with strong oxidizers may cause fire.

**Explosion:**
Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Sealed containers may rupture when heated. Sensitive to static discharge.

**Fire Extinguishing Media:**
Water spray, dry chemical, alcohol foam, or carbon dioxide. Water may be ineffective. Water spray may be used to keep fire exposed containers cool.

**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Water may be used to flush spills away from exposures and to dilute spills to non-flammable mixtures. Vapors can flow along surfaces to distant ignition source and flash back.
6. === Accidental Release Measures ===
Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e.g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802. If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures.

7. === Handling and Storage ===
Protect against physical damage. Store in a cool, dry, well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. === Exposure Controls /Personal Protection ===
Airborne Exposure Limits:
- OSHA Permissible Exposure Limit (PEL): 400 ppm (TWA)
- ACGIH Threshold Limit Value (TLV): 400 ppm (TWA), A4 - Not classifiable as a human carcinogen.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with organic vapor cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.
9. === Physical/Chemical Properties ===
Appearance: Clear liquid.
Odor: Fruity odor.
Solubility: 1 ml/10ml water @ 25C
Specific Gravity: 0.902 @ 20C/4C
pH: No information found.
% Volatiles by volume @ 21C (70F): 100
Boiling Point: 77C (171F)
Melting Point: -83C (-117F)
Vapor Density (Air=1): 3.0
Vapor Pressure (mm Hg): 76 @ 20C (68F)
Evaporation Rate (BuAc=1): 6

10. === Stability and Reactivity Data ===
Stability:
Stable under ordinary conditions of use and storage. Heat will contribute to instability. Slowly decomposed by moisture.
Hazardous Decomposition Products:
Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Avoid heat, flame and other sources of ignition. Contact with nitrates, strong oxidizers, strong alkalis, or strong acids may cause fire and explosions. Will attack some forms of plastic, rubber, and coatings. Can react vigorously with chlorosulfonic acid (LiAlH₂ + 2-chloromethyl furan), oleum, K-tert-butoxide.
Conditions to Avoid:
No information found.

11. === Toxicological Information ===
Inhalation rat LC50: 200 gm/m3; oral rat LD50: 5620 mg/kg; Skin rabbit LD50: > 20 ml/kg.
Investigated as a mutagen.

---------\Cancer Lists\-----------------------------------------------
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<td>-N-----------------</td>
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<td>No</td>
<td>None</td>
</tr>
</tbody>
</table>

12. === Ecological Information ===
Environmental Fate:
When released into the soil, this material may leach into groundwater. When released into the soil, this material may evaporate to a moderate extent. When released into water, this material may biodegrade to a moderate extent. When released to water, this material is expected to quickly evaporate. When released into the water, this material is expected to have a half-life of less than 1 day. This material has a log octanol-water partition coefficient of less than 3.0. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material may be moderately degraded by photolysis. When released into the air, this material is expected to have a half-life between 1 and 10 days.
Environmental Toxicity:
This material is not expected to be toxic to aquatic life.

13. === Disposal Considerations ===
Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. === MSDS Transport Information ===
Domestic (Land, D.O.T.)

Proper Shipping Name: ETHYL ACETATE
Hazard Class: 3
UN/NA: UN1173
Packing Group: II
Information reported for product/size: 400LB

International (Water, I.M.O.)

Proper Shipping Name: ETHYL ACETATE
Hazard Class: 3
UN/NA: UN1173
Packing Group: II
Information reported for product/size: 400LB

15. === Regulatory Information ===

Ingredient

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Ingredient

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<td>U112</td>
<td>No</td>
</tr>
</tbody>
</table>
Australian Hazchem Code: 3[Y]E
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. === Other Information ===
NFPA Ratings: Health: 1 Flammability: 3 Reactivity: 0
Label Hazard Warning:
WARNING! FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED OR INHALED. AFFECTS CENTRAL NERVOUS SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
Label Precautions:
Keep away from heat, sparks and flame. Avoid breathing vapor. Keep container closed. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.
Label First Aid:
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, give large amounts of water to drink. Never give anything by mouth to an unconscious person. In all cases, get medical attention.
Product Use:
Laboratory Reagent.
Material Safety Data Sheet
Methyl ethyl ketone MSDS

Section 1: Chemical Product and Company Identification

Product Name: Methyl ethyl ketone
Catalog Codes: SLM2626, SLM3232
CAS#: 78-93-3
RTECS: EL6475000
TSCA: TSCA 8(b) inventory: Methyl ethyl ketone
CI#: Not applicable.
Synonym: 2-Butanone
Chemical Name: Methyl Ethyl Ketone
Chemical Formula: C₄H₈O

Contact Information:
Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396
US Sales: 1-800-901-7247
International Sales: 1-281-441-4400
Order Online: ScienceLab.com
CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300
International CHEMTREC, call: 1-703-527-3887
For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS #</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl ethyl ketone</td>
<td>78-93-3</td>
<td>100</td>
</tr>
</tbody>
</table>

Toxicological Data on Ingredients: Methyl ethyl ketone: ORAL (LD50): Acute: 2737 mg/kg [Rat], 4050 mg/kg [Mouse]. DERMAL (LD50): Acute: 6480 mg/kg [Rabbit]. VAPOR (LC50): Acute: 23500 mg/m 8 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation (lung irritant).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Classified POSSIBLE for human. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to gastrointestinal tract, upper respiratory tract, skin, eyes, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention.

**Skin Contact:**
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

**Serious Skin Contact:**
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

**Inhalation:**
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:**
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

**Ingestion:**
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

**Serious Ingestion:** Not available.

---

### Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 404°C (759.2°F)

**Flash Points:**
- CLOSED CUP: -9°C (15.8°F)
- OPEN CUP: -5.5556°C (22°F) (Tag)

**Flammable Limits:**
- LOWER: 1.8%
- UPPER: 10%

**Products of Combustion:** These products are carbon oxides (CO, CO2).

**Fire Hazards in Presence of Various Substances:** Highly flammable in presence of open flames and sparks, of heat.

**Explosion Hazards in Presence of Various Substances:**

**Fire Fighting Media and Instructions:**
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

**Special Remarks on Fire Hazards:**
Ignition on contact with potassium t-butoxide. Vapor may cause a flash fire

**Special Remarks on Explosion Hazards:**
Reaction with Hydrogen Peroxide + nitric acid forms heat and shock-sensitive explosive product. Mixture with 2-propanol will produce explosive peroxides during storage.

---

### Section 6: Accidental Release Measures

**Small Spill:**
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

**Large Spill:**
Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined spaces.
areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

**Precautions:**
Keep locked up. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, metals, acids, alkalis.

**Storage:**
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**
TWA: 200 STEL: 300 (ppm) from ACGIH (TLV) [United States] [1999] TWA: 150 STEL: 300 (ppm) [Australia] TWA: 590 STEL: 885 (mg/m3) from NIOSH TWA: 200 STEL: 300 (ppm) from NIOSH TWA: 590 STEL: 885 (mg/m3) [Canada] TWA: 200 STEL: 300 (ppm) from OSHA (PEL) [United States] TWA: 590 STEL: 885 (mg/m3) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:**
Acetone-like Pleasant. Pungent. Sweetish. (Strong.)

**Taste:** Not available.

**Molecular Weight:** 72.12g/mole

**Color:** Clear Colorless.

**pH (1% soln/water):** Not available.

**Boiling Point:** 79.6 (175.3°F)

**Melting Point:** -86°C (-122.8°F)

**Critical Temperature:** 262.5°C (504.5°F)

**Specific Gravity:** 0.805(Water = 1)

**Vapor Pressure:** 10.3 kPa (@ 20°C)

**Vapor Density:** 2.41 (Air = 1)
Volatility: Not available.
Odor Threshold: 0.25 ppm
Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 0.3
Ionicity (in Water): Not available.
Dispersion Properties: See solubility in water, diethyl ether, acetone.
Solubility: Soluble in cold water, diethyl ether, acetone.

### Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Heat, ignition sources, mechanical shock, incompatible materials.

**Incompatibility with various substances:** Reactive with oxidizing agents, metals, acids, alkalis.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Incompatible with chloroform, copper, hydrogen peroxide, nitric acid, potassium t-butoxide, 2-propanol, chlorosulfonic acid, strong oxidizers, amines, ammonia, inorganic acids, isocyanates, caustics, pyrindines. Vigorous reaction with chloroform + alkali.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

### Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation.

**Toxicity to Animals:**
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2737 mg/kg [Rat]. Acute dermal toxicity (LD50): 6480 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 32000 mg/m3 4 hours [Mouse].

**Chronic Effects on Humans:**
MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Classified POSSIBLE for human. May cause damage to the following organs: gastrointestinal tract, upper respiratory tract, skin, eyes, central nervous system (CNS).

**Other Toxic Effects on Humans:** Hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation (lung irritant).

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** May cause birth defects based on animal data. Embryotoxic and/or foetotoxic in animal.

**Special Remarks on other Toxic Effects on Humans:**
Acute Potential Health Effects: Skin: Causes skin irritation. May be absorbed through the skin. Eyes: Causes eye irritation. Inhalation: Inhalation of high concentrations may cause central nervous effects characterized by headache, dizziness, unconsciousness, and coma. Causes respiratory tract irritation and affects the sense organs. May affect the liver and urinary system. Ingestion: Causes gastrointestinal tract irritation with nausea, vomiting and diarrhea. May affect the liver. Chronic Potential Health Effects: Chronic inhalation may cause effects similar to those of acute inhalation. Prolonged or repeated skin contact may cause defatting and dermatitis.
Section 12: Ecological Information

Ecotoxicity: Ecotoxicity in water (LC50): 3220 mg/l 96 hours [Fathead Minnow]. 1690 mg/l 96 hours [Bluegill].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Ethyl methyl ketone UNNA: 1193 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
New York release reporting list: Methyl ethyl ketone Rhode Island RTK hazardous substances: Methyl ethyl ketone Pennsylvania RTK: Methyl ethyl ketone Minnesota: Methyl ethyl ketone Massachusetts RTK: Methyl ethyl ketone New Jersey: Methyl ethyl ketone California Director's list of Hazardous Substances: Methyl ethyl ketone TSCA 8(b) inventory: Methyl ethyl ketone TSCA 8(d) H and S data reporting: Methyl ethyl ketone: Effective: 10/4/82; Sunset: 10/4/92 SARA 313 toxic chemical notification and release reporting: Methyl ethyl ketone CERCLA: Hazardous substances.: Methyl ethyl ketone: 5000 lbs. (2268 kg)

Other Regulations:

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):

HMIS (U.S.A.):

Health Hazard: 2
Fire Hazard: 3
Reactivity: 0
Personal Protection: h
National Fire Protection Association (U.S.A.):

- **Health:** 1
- **Flammability:** 3
- **Reactivity:** 0
- **Specific hazard:**

**Protective Equipment:**
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

<table>
<thead>
<tr>
<th>Section 16: Other Information</th>
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<tbody>
<tr>
<td><strong>References:</strong> Not available.</td>
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<tr>
<td><strong>Other Special Considerations:</strong> Not available.</td>
</tr>
<tr>
<td><strong>Created:</strong> 10/10/2005 08:39 PM</td>
</tr>
<tr>
<td><strong>Last Updated:</strong> 05/21/2013 12:00 PM</td>
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TECHNICAL DATA SHEET
ISO PROPYL ALCOHOL

SECTION 1 – GENERAL DESCRIPTION

Isopropyl alcohol (2-propanol), also called Isopropanol, Technical Grade, is manufactured at world class dedicated plant of Deepak Fertilisers & Petrochemicals Corporation Limited in Maharashtra, India.

It is manufactured by hydration of propylene at high temperature and pressure followed by multiple purification processes to achieve high purity.

Our highly controlled manufacturing process ensures consistent quality. The product is available in tanker loads or metallic drums.

SECTION 2 – TYPICAL PROPERTIES.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>iso propyl alcohol</th>
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</thead>
<tbody>
<tr>
<td>Chemical Formula</td>
<td>(CH$_3$)$_2$CHOH</td>
</tr>
<tr>
<td>CAS Number</td>
<td>67-63-0</td>
</tr>
<tr>
<td>Synonym(s) General Use</td>
<td>2-propanol, iso propanol, sec-propyl alcohol</td>
</tr>
<tr>
<td>Flash point</td>
<td>12°C (54°F)</td>
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<tr>
<td>Flash point method</td>
<td>Closed Cup</td>
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<tr>
<td>Auto ignition temp.</td>
<td>399°C (750°F)</td>
</tr>
<tr>
<td>LEL</td>
<td>2%</td>
</tr>
<tr>
<td>UEL</td>
<td>12.5%</td>
</tr>
<tr>
<td>Physical State</td>
<td>liquid</td>
</tr>
<tr>
<td>Appearance &amp; Odour</td>
<td>colorless liquid with alcoholic odor</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>44 mmHg @ 25°C</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>0.79@ 20°C</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>Miscible in water</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>82°C</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>(-)88.4°C</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Deepak Fertilisers and Petrochemicals Corpn. Ltd.
Plot K-1, MIDC Indl. Area, Taloja A.V., Dist: Raigad
SECTION 3 - APPLICATIONS

IPA is widely used as solvent for coatings, pharma applications, other industrial processes & in electronic industry. Majority of the IPA manufactured globally finds its use as a solvent.

IPA also finds medical/personal hygiene applications as Rubbing alcohol, hand sanitizer, and disinfecting pads typically contain a 60–70% solution of isopropyl alcohol in water.

IPA is also used as a water-drying aid.

IPA is used in appreciable quantities for manufacturing of downstream derivatives like iso-propyl acetate, isopropyl titanate, etc.

SECTION 4 STORAGE AND HANDLING

IPA is stable at room temperatures and can be stored safely in dry, cold and non-explosive locations.

For more details on storage, safety and handling details, please refer the Material Safety Data Sheet of IPA.

Disclaimer
This information is offered to you in good faith as accurate. We believe that information to be correct but cannot guarantee its accuracy or completeness. For Health and safety precautions please refer Material Safety Datasheet. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents.
SAFETY DATA SHEET

n-Propyl acetate
10580
Version / Revision 4.00  Revision Date 09-Jun-2017
Supersedes Version 3.00***  Issuing date 09-Jun-2017

SECTION 1: Identification

1.1. Product identifier

Identification of the substance/preparation n-Propyl acetate
Chemical Name Propyl acetate***
CAS-No 109-60-4

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance / Preparation solvent
Uses advised against None

1.3. Details of the supplier of the safety data sheet

Supplier OXEA Corporation
1505 West LBJ Freeway, Suite 400
Dallas, TX 75234
USA
Phone: +1 972 481 2700

Product Information Product Stewardship
FAX: +49 (0)208 693 2053
email: psq@oxea-chemicals.com

1.4. Emergency telephone number

Emergency telephone number in USA, call 800 424 9300
outside USA, call USA 703 527 3887, collect calls accepted
available 24/7

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

This substance is classified in accordance with paragraph (d) of §1910.1200 (GHS-US classification).

- Serious eye damage/eye irritation Category 2B, H320
- Target Organ Systemic Toxicant - Single exposure Category 3, H336
- Flammable liquid Category 2, H225
- Environmental hazard Aquatic Acute 3; H402

OSHA Specified Hazards Not applicable.

Emergency telephone number in USA, call 800 424 9300; outside USA, call USA 703 527 3887, collect calls accepted

USA (A-US)
2.2. Label elements

Labeling according to §1910.1200 (GHS-US labeling).

Hazard symbol(s)

![Danger symbol]

Signal word  Danger

Hazard statements  
H225: Highly flammable liquid and vapor.  
H320: Causes eye irritation  
H336: May cause drowsiness or dizziness.  
H402: Harmful to aquatic life

Precautionary statements

Prevention  
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
P233: Keep container tightly closed.  
P240: Ground and bond container and receiving equipment.  
P241: Use explosion-proof electrical/ventilating/lighting equipment.  
P242: Use non-sparking tools.  
P243: Take action to prevent static discharges.  
P261: Avoid breathing gas/mist/vapours.  
P264: Wash hands thoroughly after handling.  
P271: Use only outdoors or in a well ventilated area.  
P273: Avoid release to the environment.  
P280: Wear protective gloves/eye protection/face protection.

Response  
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.  
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P312: Call a POISON CENTRE/doctor if you feel unwell.

Storage  
P403 + P235: Store in a well ventilated place. Keep cool.  
P405: Store locked up.

Disposal  
P501: Dispose of contents/container in accordance with local regulation.

2.3. Other hazards
Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback. Vapours may form explosive mixture with air. Components of the product may be absorbed into the body by inhalation and ingestion. Repeated exposure may cause skin dryness or cracking.

### SECTION 3: Composition / information on ingredients

#### 3.1. Substances

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propyl acetate</td>
<td>109-60-4</td>
<td>&gt; 99,5</td>
</tr>
</tbody>
</table>

### SECTION 4: First aid measures

#### 4.1. Description of first aid measures

**Inhalation**
Keep at rest. Aerate with fresh air. When symptoms persist or in all cases of doubt seek medical advice.

**Skin**
Wash off immediately with soap and plenty of water. When symptoms persist or in all cases of doubt seek medical advice.

**Eyes**
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Immediate medical attention is required.

**Ingestion**
Call a physician immediately. Do not induce vomiting without medical advice.

#### 4.2. Most important symptoms and effects, both acute and delayed

**Main symptoms**
dizziness, drowsiness, cough, unconsciousness.

**Special hazard**
central nervous system effects, Prolonged skin contact may defat the skin and produce dermatitis.

#### 4.3. Indication of any immediate medical attention and special treatment needed

**General advice**
Remove contaminated, soaked clothing immediately and dispose of safely. First aider needs to protect himself. Treat symptomatically.

### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media
SAFETY DATA SHEET

n-Propyl acetate
10580

Suitable extinguishing media
foam, dry chemical, carbon dioxide (CO2), water spray

Unsuitable Extinguishing Media
Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture

Under conditions giving incomplete combustion, hazardous gases produced may consist of:
carbon monoxide (CO)
carbon dioxide (CO2)
Combustion gases of organic materials must in principle be graded as inhalation poisons
Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback
Vapours may form explosive mixture with air

5.3. Advice for firefighters

Special protective equipment for firefighters
Fire fighter protection should include a self-contained breathing apparatus (NIOSH-approved or EN 133) and full
fire-fighting turn out gear.

Precautions for firefighting
Cool containers / tanks with water spray. Dike and collect water used to fight fire. Keep people away from and upwind
of fire.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: For personal protective equipment see section 8. Avoid contact with skin and eyes.
Avoid breathing vapors or mists. Keep people away from and upwind of spill/leak. Ensure adequate ventilation,
especially in confined areas. Keep away from heat and sources of ignition.
For emergency responders: Personal protection see section 8.***

6.2. Environmental precautions

Prevent further leakage or spillage. Do not discharge product into the aquatic environment without pretreatment
(biological treatment plant).

6.3. Methods and material for containment and cleaning up

Methods for containment
Stop the flow of material, if possible without risk. Dike spilled material, where this is possible.

Methods for cleaning up
Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. If liquid has been spilt in large
quantities clean up promptly by scoop or vacuum. Dispose of in accordance with local regulations. Take necessary
action to avoid static electricity discharge (which might cause ignition of organic vapours).
6.4. Reference to other sections

For personal protective equipment see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Provide sufficient air exchange and/or exhaust in work rooms. Do not use compressed air for filling, discharging or
handling.

Hygiene measures
When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Advice on the protection of the environment
See Section 8: Environmental exposure controls.

Incompatible products
oxidizing agents
bases
amines

7.2. Conditions for safe storage, including any incompatibilities

Advice on protection against fire and explosion
Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). In case of fire, emergency cooling with water spray should be available. Ground and bond containers when transferring material. Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback. Vapours may form explosive mixture with air.

Technical measures/Storage conditions
Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care.

Suitable material
stainless steel, mild steel

Unsuitable material
Attacks some forms of plastic and rubber

SECTION 8: Exposure controls / personal protection

8.1. Control parameters

Exposure limits United States of America

US ACGIH
8.2. Exposure controls

Appropriate Engineering controls
General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred. Explosion-proof equipment (for example fans, switches, and grounded ducts) should be used in mechanical ventilation systems.

Individual protection measures, such as personal protective equipment

General industrial hygiene practice
Avoid contact with skin, eyes and clothing. Do not breathe vapours or spray mist. Ensure that eyewash stations and safety showers are close to the workstation location.

Hygiene measures
When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

Eye protection
Tightly fitting safety goggles. In addition to goggles, wear a face shield if there is a reasonable chance for splash to the face.

Hand protection
Wear protective gloves. Recommendations are listed below. Other protective material may be used, depending on the situation, if adequate degradation and permeation data is available. If other chemicals are used in conjunction with this chemical, material selection should be based on protection for all chemicals present.

| Suitable material       | butyl-rubber                          |
| Evaluation              | according to EN 374: level 4          |
| Glove thickness         | approx 0.3 mm                         |
| Break through time      | approx 120 min                        |

| Suitable material       | polyvinylchloride / nitrile rubber    |
| Evaluation              | according to EN 374: level 1          |
| Glove thickness         | approx 0.9 mm                         |
| Break through time      | approx 15 min                         |

Note
For details and further information please refer to the original regulation.
SAFETY DATA SHEET

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10580
Version / Revision 4.00

Skin and body protection
Impervious clothing. Wear face-shield and protective suit for abnormal processing problems.

Respiratory protection
Respirator with filter for organic vapour. Use the indicated respiratory protection if the occupational exposure limit is exceeded and/or in case of product release (dust). Equipment should conform to NIOSH.

Environmental exposure controls
If possible use in closed systems. If leakage can not be prevented, the substance needs to be suck off at the emersion point, if possible without danger. Observe the exposure limits, clean exhaust air if needed. If recycling is not practicable, dispose of in compliance with local regulations. Inform the responsible authorities in case of leakage into the atmosphere, or of entry into waterways, soil or drains.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>colourless</td>
</tr>
<tr>
<td>Odour</td>
<td>fruity</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point/range</td>
<td>-135 °F (-93 °C)</td>
</tr>
<tr>
<td>Boiling point/range</td>
<td>215 °F (101,5 °C) @ 1 atm (101,3 kPa)</td>
</tr>
<tr>
<td>Flash point</td>
<td>54 °F (12 °C)</td>
</tr>
<tr>
<td>Method</td>
<td>DIN 53213</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Does not apply, the substance is a liquid</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>2 Vol %</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>8 Vol %</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td></td>
</tr>
<tr>
<td>Fluid [hPa]</td>
<td>34</td>
</tr>
<tr>
<td>Fluid [kPa]</td>
<td>3,4</td>
</tr>
<tr>
<td>Fluid [atm]</td>
<td>0,034</td>
</tr>
<tr>
<td>Method</td>
<td>@ °C</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>20</td>
</tr>
<tr>
<td>Flash point</td>
<td>@ °F</td>
</tr>
<tr>
<td></td>
<td>68</td>
</tr>
<tr>
<td>Vapour density</td>
<td>3,5 (Air = 1) @ 20 °C (68 °F)</td>
</tr>
<tr>
<td>Relative density</td>
<td>0,888</td>
</tr>
<tr>
<td>Method</td>
<td>@ °C</td>
</tr>
<tr>
<td>Solubility</td>
<td>18,9 g/l @ 20 °C (68 °F)***</td>
</tr>
<tr>
<td>Method</td>
<td>@ °F</td>
</tr>
<tr>
<td>log Pow</td>
<td>1,4 (measured) OECD 117</td>
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<td>Autoignition temperature</td>
<td>716 °F (380 °C)</td>
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<td>Method</td>
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<td>Decomposition temperature</td>
<td>No data available</td>
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<tr>
<td>Viscosity</td>
<td>0,58 mPa*s @ 68 °F (20 °C)</td>
</tr>
<tr>
<td>Method</td>
<td>ASTM D445</td>
</tr>
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</table>

9.2. Other information

Emergency telephone number
in USA, call 800 424 9300; outside USA, call USA 703 527 3887, collect calls accepted
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n-Propyl acetate
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102.13
C5 H10 O2

Molecular weight
Molecular formula
Oxidizing properties

Does not apply, substance is not oxidising. There are no chemical groups associated with oxidizing properties.

1.384 @ 68 °F (20 °C)

Refractive Index
Explosive properties

Does not apply, substance is not explosive. There are no chemical groups associated with explosive properties.

SECTION 10: Stability and Reactivity

10.1. Reactivity

The reactivity of the product corresponds to the typical reactivity shown by the substance group as described in any text book on organic chemistry.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Vapours may form explosive mixture with air.

10.4. Conditions to avoid

Avoid contact with heat, sparks, open flame and static discharge. Avoid any source of ignition.

10.5. Incompatible materials

oxidizing agents, amines, bases.

10.6. Hazardous decomposition products

No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure

Ingestion, Inhalation, Eye contact, Skin contact

**Propyl acetate, CAS: 109-60-4**

Main symptoms
dizziness, drowsiness, cough, unconsciousness.

**Target Organ Systemic Toxicant - Single exposure**
The available data lead to the classification given in section 2

**Target Organ Systemic Toxicant - Repeated exposure**
Based on available data, the classification criteria are not met for:

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n-Propyl acetate
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Acute toxicity

<table>
<thead>
<tr>
<th>Propyl acetate (109-60-4)</th>
<th>Routes of Exposure</th>
<th>Endpoint</th>
<th>Values</th>
<th>Species</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oral</td>
<td>LD50</td>
<td>~ 8700 mg/kg</td>
<td>rat, male</td>
<td></td>
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<tr>
<td></td>
<td>Dermal</td>
<td>LD50</td>
<td>&gt; 17800 mg/kg</td>
<td>rabbit</td>
<td></td>
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<tr>
<td></td>
<td>Inhalative</td>
<td>LC50</td>
<td>~ 32 mg/l (4h)</td>
<td>rat</td>
<td></td>
</tr>
</tbody>
</table>

Propyl acetate, CAS: 109-60-4

Assessment
Based on available data, the classification criteria are not met for:
- Acute oral toxicity
- Acute dermal toxicity
- Acute inhalation toxicity

Irritation and corrosion

<table>
<thead>
<tr>
<th>Propyl acetate (109-60-4)</th>
<th>Target Organ Effects</th>
<th>Species</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Skin</td>
<td>rabbit</td>
<td>No skin irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eyes</td>
<td>rabbit</td>
<td>irritating</td>
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</table>

Propyl acetate, CAS: 109-60-4

Assessment
The available data lead to the classification given in section 2

Sensitization

<table>
<thead>
<tr>
<th>Propyl acetate (109-60-4)</th>
<th>Target Organ Effects</th>
<th>Species</th>
<th>Evaluation</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Skin</td>
<td>guinea pig</td>
<td>not sensitizing</td>
<td>Maximisation Test read across</td>
</tr>
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</table>

Propyl acetate, CAS: 109-60-4

Assessment
Based on available data, the classification criteria are not met for:
- Skin sensitization
- For respiratory sensitization, no data are available

Subacute, subchronic and prolonged toxicity

<table>
<thead>
<tr>
<th>Propyl acetate (109-60-4)</th>
<th>Type</th>
<th>Dose</th>
<th>Species</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subchronic toxicity</td>
<td>NOAEL: 2,35 mg/l</td>
<td>rat, male/female</td>
<td>EPA OTS 798.2450 Inhalation</td>
</tr>
</tbody>
</table>

Propyl acetate, CAS: 109-60-4

Assessment
Based on available data, the classification criteria are not met for:
- STOT RE

Carcinogenicity, Mutagenicity, Reproductive toxicity

<table>
<thead>
<tr>
<th>Propyl acetate (109-60-4)</th>
<th>Type</th>
<th>Dose</th>
<th>Species</th>
<th>Evaluation</th>
<th>Method</th>
</tr>
</thead>
</table>

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Mutagenicity
Salmonella typhimurium negative OECD 471 (Ames) In vitro study

Mutagenicity
CHO (Chinese Hamster Ovary) cells negative OECD 476 (Mammalian Gene Mutation) read across

Mutagenicity
V79 cells, Chinese hamster negative Chromosomal Aberration read across

Reproductive toxicity LOAEC: 750 ppm rat, male/female OECD 416 read across

Developmental Toxicity LOAEL: 7,05 mg/l rat Maternal toxicity Inhalation read across

Developmental Toxicity NOAEL 7,05 mg/l rat Teratogenicity Inhalation read across

Developmental Toxicity NOAEL 7,05 mg/l rabbit Maternal toxicity Inhalation read across

Developmental Toxicity NOAEL 7,05 mg/l rabbit Teratogenicity Inhalation read across

Propyl acetate, CAS: 109-60-4
CMR Classification
The available data on CMR properties are summarized in the table above. They do not indicate a classification into categories 1A or 1B

Evaluation
In vitro tests did not show mutagenic effects

Propyl acetate, CAS: 109-60-4
Other adverse effects
Components of the product may be absorbed into the body by inhalation and ingestion. Dries out the skin.

Note
Handle in accordance with good industrial hygiene and safety practice. Further details on substance data can be found in the registration dossier under the following link:

SECTION 12: Ecological information

12.1. Toxicity

Acute aquatic toxicity
Propyl acetate (109-60-4)

<table>
<thead>
<tr>
<th>Species</th>
<th>Exposure time</th>
<th>Dose</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pimephales promelas (fathead minnow)</td>
<td>96h</td>
<td>LC50: 60 mg/l</td>
<td></td>
</tr>
<tr>
<td>Daphnia magna (Water flea)</td>
<td>48h</td>
<td>EC50: 91,5 mg/l</td>
<td>OECD 202</td>
</tr>
<tr>
<td>Pseudokirchneriella subcapitata</td>
<td>72h</td>
<td>EC50: 672 mg/l (Growth rate)</td>
<td>OECD 201</td>
</tr>
<tr>
<td>Pseudomonas putida</td>
<td>16 h</td>
<td>TTC: 170 mg/l</td>
<td>DIN 38412, part 8</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

Propyl acetate, CAS: 109-60-4
Biodegradation
62 % (5 d), Sewage, domestic, non-adapted, aerobic, OECD 301 D.

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12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Type</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propyl acetate (109-60-4)</td>
<td>log Pow***</td>
<td>1.4*** measured, OECD 117***</td>
</tr>
</tbody>
</table>

12.4. Mobility in soil

<table>
<thead>
<tr>
<th>Type</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propyl acetate (109-60-4)</td>
<td>no data available***</td>
<td></td>
</tr>
</tbody>
</table>

12.5. Results of PBT and vPvB assessment

**Propyl acetate, CAS: 109-60-4**

**PBT and vPvB assessment**

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT), nor very persistent nor very bioaccumulating (vPvB)

12.6. Other adverse effects

**Propyl acetate, CAS: 109-60-4**

No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

**Product Information**

Disposal required in compliance with all waste management related state and local regulations. The choice of the appropriate method of disposal depends on the product composition by the time of disposal as well as the local statutes and possibilities for disposal.

**Uncleaned empty packaging**

Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.

SECTION 14: Transport information

**D.O.T. (49CFR)**

14.1. UN number       UN 1276
14.2. UN proper shipping name n-Propyl acetate
14.3. Transport hazard class(es) 3
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n-Propyl acetate
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14.4. Packing group II
14.5. Environmental hazards no
14.6. Special precautions for user Emergency Response Guide 129

ICAO-TI / IATA-DGR

14.1. UN number UN 1276
14.2. UN proper shipping name n-Propyl acetate
14.3. Transport hazard class(es) 3
14.4. Packing group II
14.5. Environmental hazards no
14.6. Special precautions for user no data available

IMDG

14.1. UN number UN 1276
14.2. UN proper shipping name Propyl acetate
14.3. Transport hazard class(es) 3
14.4. Packing group II
14.5. Environmental hazards no
14.6. Special precautions for user EmS F-E, S-D

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

SECTION 15: Regulatory information

Federal and State Regulations
Components of the product are listed in the quoted regulations. For details please refer to the regulations directly.
This list is not exhaustive, please check for other applicable regulations.

Federal Regulations
This product is listed on the TSCA inventory

State Regulations
Propyl acetate, CAS: 109-60-4
CA Hazardous Substances (Director's) List

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IL Chemical Safety Act
MA RTK List
MN Hazardous Substances List
NY RTK List
PA RTK List
RI RTK List

International Inventories

Propyl acetate, CAS: 109-60-4
AICS (AU)
DSL (CA)
IECSC (CN)
EC-No. 2036861 (EU)
ENCS (2)-727 (JP)
ISHL (2)-727 (JP)
KECI KE-29778 (KR)
INSQ (MX)
PICCS (PH)
TSCA (US)
NZIoC (NZ)
TCSI (TW)

SECTION 16: Other information

Revision Date 09-Jun-2017
Issuing date 09-Jun-2017

Hazard Rating Systems

NFPA (National Fire Protection Association)
Health Hazard 1
Fire Hazard 3
Reactivity 0

HMIS (Hazardous Material Information System)
Health Hazard 1
Flammability 3
Physical Hazard 0

Training advice
For effective first-aid, special training / education is needed.

Sources of key data used to compile the datasheet
Information contained in this safety data sheet is based on Oxea owned data and public sources deemed valid or acceptable. The absence of data elements required by OSHA, ANSI or Annex II, Regulation 1907/2006/EC indicates, that no data meeting these requirements is available.

Further information for the safety data sheet
Changes against the previous version are marked by ***. Observe national and local legal requirements. For more information, other material safety data sheets or technical data sheets please consult the Oxea homepage (www.oxea-chemicals.com).

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Disclaimer
For industrial use only. The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. Oxea makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances. User has the sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. User must meet all applicable safety and health standards.

End of Safety Data Sheet
Excel Organics offers glycol ether from India's largest producer and the only plant in India to use a continuous process with world-renowned Sulzer Chemtech technology.

We offer ethyl / butyl glycol ethers and its acetates, which find application in the paint and coating, automotive brake fluid and electronic chemical industries. We can also offer methyl glycol ethers, phenoxy ethanol, etc.

Our products meet stringent international specifications and are marketed under the IG SOL, IG TOL and IG ACE series of products.

Our products are used in Europe, South East Asia and the Middle East.

### Industry-wise applications:

<table>
<thead>
<tr>
<th>Glycol ethers</th>
<th>Ethylene glycol mono ethyl ether</th>
<th>Di ethylene glycol mono ethyl ether</th>
<th>Tri ethylene glycol mono ethyl ether</th>
<th>Ethylene glycol mono butyl ether</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Textile</strong></td>
<td></td>
<td></td>
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<tr>
<td>Printing and dyeing</td>
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<tr>
<td>Dye manufacture</td>
<td>√</td>
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<tr>
<td><strong>Oil and gas</strong></td>
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<tr>
<td>Oil and gas production</td>
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<tr>
<td><strong>Paints and emulsion polymerisation</strong></td>
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<tr>
<td><strong>Solvent</strong></td>
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<tr>
<td><strong>Automotive</strong></td>
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<td>Hydraulic brake fluid</td>
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<tr>
<td><strong>Pharma</strong></td>
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<tr>
<td><strong>Other industries</strong></td>
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<td>√</td>
</tr>
<tr>
<td><strong>Flavour and fragrances</strong></td>
<td></td>
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</tr>
<tr>
<td>Non-volatile carriers</td>
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<tr>
<td><strong>Ink</strong></td>
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<tr>
<td><strong>Solvent</strong></td>
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<table>
<thead>
<tr>
<th>Glycol ethers</th>
<th>Di ethylene glycol mono butyl ether</th>
<th>Tri ethylene glycol mono butyl ether</th>
<th>Ethylene glycol mono ethyl ether acetate</th>
<th>Di ethylene glycol mono ethyl ether acetate</th>
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<tr>
<td><strong>Textile</strong></td>
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<td><strong>Paints and emulsion polymerisation</strong></td>
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<td>Hydraulic brake fluid</td>
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<td><strong>Pharma</strong></td>
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<td><strong>Other industries</strong></td>
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<td>Glycol ethers and acetates</td>
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<td>( IGTOL 12016E)</td>
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<td>( IGTOL 12016B)</td>
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<tr>
<td>CONTACT US FOR MORE PRODUCTS UNDER THIS CATEGORY</td>
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