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| MATERIALS SAFETY DATA SHEET (MSDS) isopropanol (C3H8O) | MSDS Number: | |
| | Version number: | |
| | Date issued: | |
| | Page No: | |

1. Product Identification

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|-------------------------------|---------------------------------|
| Chemical name | isopropanol |
| Other means of identification | Isopropyl alcohol, 2-Propanol |
| Product use | Synthetic/Analytical chemistry. |
| CAS No | 67-63-0 |

Manufacturer/Importer/Supplier/Distributor information

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| Manufacturer Supplier | |
| E-Mail | |
| Contact Person | Entity 1 Made by India |
| Emergency Telephone | |

2. Hazard(s) identification

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| OSHA/HCS status | This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). |
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Classification of the substance or mixture

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| Flammable Liquids | Category 2 |
| Eye Irritation | Category 2A |



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| Specific Target Organ Toxicity (Single Exposure) (Narcotic effects) - | Category 3 |
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| GHS label elements | |
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| Hazard pictograms | |
| Signal word | Danger |
| Hazard statements | May form explosive mixtures with air. Highly flammable liquid and vapor. Causes serious eye irritation. May cause drowsiness or dizziness |
| Precautionary statements | |
| General | Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. |
| Prevention | Wear protective gloves. Wear eye or face protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion- proof electrical, ventilating, lighting and all material-handling equipment. Use only non- sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Avoid breathing vapor. Wash hands thoroughly after handling. |
| Response | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention. |
| Storage | Store locked up. Store in a well-ventilated place. Keep cool. |
| Disposal | Dispose of contents and container in accordance with all local, regional, national and international regulations. |

3. Composition and ingredient information

| Chemical name | CAS number | % |
|-------------------|------------|----|
| Isopropyl alcohol | 67-63-0 | 33 |



4. First-aid measures

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| Inhalation | Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position. Seek medical advice if discomfort or irritation persists. |
| Skin contact | Wash affected area with soap and water. Rinse/flush exposed skin gently using water for 15-20 minutes. Seek medical attention if irritation persists or if concerned. |
| Eye contact | Protect unexposed eye. Immediately flush eyes with water for at least 15 minutes. Immediately get medical assistance. |
| Swallowing | Induce vomiting. Dilute mouth with water or milk after rinsing. Immediately get medical assistance. |
| Most important symptoms and effects, both acute and delayed | Shortness of breath. Irritation. Nausea. Headache. |
| Indication of any immediate medical attention and special treatment needed | If seeking medical attention, provide SDS document to physician. Physician should treat symptomatically. |

5. Fire-fighting measures

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| Extinguishing media | |
| Suitable extinguishing media | Water spray, Alcohol resistant foam, BC-powder, Carbon dioxide (CO ₂). |
| Unsuitable extinguishing media | Water jet. |
| Special hazards arising from the substance or mixture | In case of insufficient ventilation and/or in use, may form flammable/explosive vapour-air mixture. Solvent vapours are heavier than air and may spread along floors. Places which are not ventilated, e.g. unventilated below ground level areas such as trenches, conduits and shafts, are particularly prone to the presence of flammable substances or mixtures. Hazardous combustion products Carbon monoxide (CO), Carbon dioxide (CO ₂) |
| Advice for firefighters | In case of fire and/or explosion do not breathe fumes. Co-ordinate firefighting measures to the fire surroundings. Do not allow firefighting water to enter drains or water courses. Collect contaminated firefighting water separately. Fight fire with normal precautions from a reasonable distance. |

6. Accidental Release Measures



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| Personal precautions, protective equipment and emergency procedures | Wear personal protective equipment. Immediately evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Remove all sources of ignition. Do not breathe vapours or spray mist. Avoid contact with skin, eyes and clothing. |
| Environmental precautions | Prevent further leakage or spillage if safe to do so. Discharge into the environment must be avoided. Do not flush into surface water or sanitary sewer system. Do not allow run-off from fire fighting to enter drains or water courses. |
| Methods and materials for containment and cleaning up | Soak up with inert absorbent material. Pick for disposal in tightly closed containers. |

7. Handling and storage

Precautions for safe handling:

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| Protective measures | Put on appropriate personal protective equipment (see Section 8). Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Avoid contact with eyes, skin and clothing. Do not ingest. Empty containers retain product residue and can be hazardous. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Do not reuse container. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. |
| Advice on general occupational hygiene | Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures. |
| Conditions for safe storage, including any incompatibilities | Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Store locked up. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use. |

8. Exposure Controls/ Personal Protection

Control parameters

Occupational exposure limits



| Ingredient name | Exposure limits |
|-------------------|---|
| Isopropyl alcohol | <p>ACGIH TLV (United States, 3/2017). TWA: 200 ppm 8 hours. STEL: 400 ppm 15 minutes.</p> <p>OSHA PEL 1989 (United States, 3/1989). TWA: 400 ppm 8 hours. TWA: 980 mg/m³ 8 hours. STEL: 500 ppm 15 minutes. STEL: 1225 mg/m³ 15 minutes.</p> <p>NIOSH REL (United States, 10/2016). TWA: 400 ppm 10 hours. TWA: 980 mg/m³ 10 hours. STEL: 500 ppm 15 minutes. STEL: 1225 mg/m³ 15 minutes.</p> <p>OSHA PEL (United States, 6/2016). TWA: 400 ppm 8 hours. TWA: 980 mg/m³ 8 hours</p> |

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| Appropriate engineering controls | Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment. |
| Environmental exposure controls | Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels. |

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Individual protection measures

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| Hygiene measures | Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location. |
| Eye/face protection | Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection. chemical splash goggles. |

Skin protection



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| Hand protection | Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to break through for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. |
| Body protection | Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear antistatic protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves. |
| Other skin protection | Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. |
| Respiratory protection | Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. |

9. Physical and chemical properties

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| Appearance | Clear Colourless liquid |
| Odor | Alcohol |
| Odor threshold | Not Available |
| pH-value | Not Available |
| Melting/Freezing point | Below -88°C |
| Boiling point/Boiling range | Approx 82°C |
| Flash point (closed cup) | 12.0°C |
| Evaporation rate | 3.0 |
| Flammability (solid, gaseous): | Flammable |
| Explosion limit lower: | 2% |
| Explosion limit upper: | 12.7% |
| Vapor pressure: | Approx 33 at 20°C |
| Vapor density: | Not Available |
| Relative density: | 0.785 g/mL at 25°C |



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| Solubilities: | Infinite solubility |
| Partition coefficient (n- octanol/water): | log Pow: 0.05 |
| Auto/Self-ignition temperature: | 425.0°C |
| Decomposition temperature: | Not Available |
| Density | Not Available |
| Kinematic Viscosity: | Not Available |
| Dynamic Viscosity: | Not Available |

10. Stability and reactivity

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| Reactivity | No specific test data related to reactivity available for this product or its ingredients |
| Chemical stability | The product is stable. |
| Possibility of hazardous reactions | Under normal conditions of storage and use, hazardous reactions will not occur. |
| Conditions to avoid | Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas. |
| Incompatible materials | Reactive or incompatible with the following materials:Oxidizing materials |
| Hazardous decomposition products | Under normal conditions of storage and use, hazardous decomposition products should not be produced. |
| Hazardous polymerization | Under normal conditions of storage and use, hazardous polymerization will not occur. |

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11. Toxicological information

Information on toxicological effects

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| Acute oral toxicity | LD50 Species: Rat Value: 5.840 mg/kg Method: OECD Test Guideline 401 |
| Acute dermal toxicity: | no data available |
| Acute inhalation toxicity | LC50 Species: Rat Value: > 10000 ppm Exposure time: 6 h Method: OECD Test Guideline 403 |
| Skin irritation: | Species: Rabbit Result: slight irritation |



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| | According to the classification criteria of the European Union, the product is not considered as being a skin irritant. |
| Eye irritation: | Species: Rabbit Result: irritating Method: OECD Test Guideline 405 |
| Respiratory or skin sensitization: | Buehler Test Species: Guinea pig Result: non-sensitizing Method: OECD Test Guideline 406 |
| Carcinogenicity: | Note: Not classified due to data which are conclusive although insufficient for classification. |
| Germ cell mutagenicity | Test Method: In vitro mammalian cell gene mutation test Cell type: Chinese Hamster Ovary Cells Metabolic activation: with and without metabolic activation Result: negative Method: OECD Test Guideline 476 Test Method: Ames test Metabolic activation: with and without metabolic activation Result: negative Method: OECD Test Guideline 471 Test Method: Micronucleus test Species: Mouse Method: OECD Test Guideline 474 Result: negative |
| Aspiration hazard | no data available |
| Other information | Solvent vapours have a narcotic effect if inhaled in high concentrations. |

12. Ecological information

Toxicity

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| Toxicity to fish | LC50 flow-through test Species: Pimephales promelas (fathead minnow) Value: 9.640 mg/l Exposure time: 96 h Method: OECD Test Guideline 203 |
| Toxicity to aquatic plants | Not classified due to data which are conclusive although insufficient for classification. |
| Toxicity to Microorganisms | static test Species: Pseudomonas putida Value: 1.050 mg/l Exposure time: 16 h Method: DIN 38412 |
| Toxicity to aquatic invertebrates | EC50 static test |



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| | Species: Daphnia magna (Water flea) Value: > 10.000 mg/l Exposure time: 24 h Method: OECD Test Guideline 202 |
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Persistence and degradability

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| Biodegradability | Readily biodegradable. |
| Bio accumulative potential | No data available. |
| Mobility in soil | No data available. |
| Results of PBT and vPvB assessment | This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB). |
| Other adverse effects | No data available. |

13. Disposal considerations

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| Disposal methods | <p>The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with therequirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be consideredwhen recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.</p> |
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14. Transport information

| | DOT | TDG | Mexico | IMDG | IATA |
|-----------------------------------|---|---|--|---|---|
| UN number | UN1219 | UN1219 | UN1219 | UN1219 | UN1219 |
| UN proper shipping name | ISOPROPANOL OR ISOPROPYLALCOHOL | ISOPROPANOL; OR ISOPROPYLALCOHOL | ISOPROPANOL OR ISOPROPYLALCOHOL | ISOPROPANOL (ISOPROPYLALCOHOL) | ISOPROPANOL |
| Transport hazard class(es) | 3  | 3  | 3  | 3  | 3  |



| | | | | | |
|------------------------------|-----|-----|-----|-----|-----|
| Packing group | II | II | II | II | II |
| Environmental hazards | No. | No. | No. | No. | No. |

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

Additional information

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| DOT Classification | <p>Limited quantity :Yes. Quantity limitation : Passenger aircraft/rail: 5 L. Cargo aircraft: 60 L. Special provisions: IB2, T4, TP1</p> |
| TDG Classification | <p>Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.18-2.19 (Class 3). Explosive Limit and Limited Quantity Index: 1 Passenger Carrying Road or Rail Index: 5</p> |
| IATA | <p>Quantity limitation: Passenger and Cargo Air</p> |
| Special precautions for user | <p>Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.</p> |
| Transport in bulk according to IMO instruments | <p>Not available.</p> |

15. Regulatory information

Entity 1 | Made by India

Safety, health and environmental regulations/legislation specific for the substance or mixture:

| Basis | Value | Remarks |
|-------------------------------|-------------------------|---------|
| Directive 2012/18/EC | Amount 1: 5.000.000 kg | |
| Listed in Regulation : P5c: | Amount 2: 50.000.000 kg | |
| FLAMMABLE LIQUIDS | | |
| Number in Regulation: 1.2.5.3 | | |

16. Any other relevant information



History

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|--------------------------------|--|
| Product name | |
| Product code | |
| Date of printing | |
| Date of issue/Date of revision | |
| Date of previous issue | |
| Version | |
| Prepared by | |

17. Change Details

