COMET CHEMICAL COMPANY LTD.

MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Product identifier	**Di-Isobutyl Ketone**
Version #	01
Issue date	06-05-2014
CAS #	Mixture
MSDS Number	COM126
Product use	Professional use only
Manufacturer information	Refer to supplier
Supplier	Comet Chemical 3463 Thomas Street Innisfill, ON L9S 3W4 CA Information (M-F 8:00-5:00): 705-436-5580 24 Hour Number (Newalta): 800-567-7455

2. Hazards Identification

Emergency overview

Clear, colorless liquid with mild odor.

WARNING

Combustible liquid and vapor. May be ignited by heat, sparks or flames. May cause eye and skin irritation. May cause central nervous system effects. May cause irritation to the nose, throat and upper respiratory tract. May be an aspiration hazard.

Potential health effects

Routes of exposure	Inhalation. Ingestion. Eye contact. Skin contact.
Eyes	Direct contact may cause very mild, temporary irritation and redness.
Skin	Direct skin contact may cause slight or mild, transient irritation.
Inhalation	May cause central nervous system effects. May cause irritation to the nose, throat and upper respiratory tract.
Ingestion	Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Aspiration hazard. Aspiration into the lungs during swallowing or subsequent vomiting may cause chemical pneumonitis, which can be fatal.
Target organs	Central nervous system. Kidneys. Liver. Respiratory system.
Chronic effects	Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis. Chronic skin contact with low concentrations may cause dermatitis. Prolonged or repeated overexposure may cause liver and kidney effects.
Signs and symptoms	Direct eye contact may cause slight or mild, transient irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Direct eye contact may cause slight or mild, transient irritation. Symptoms may include redness, edema, drying, defatting and cracking of the skin. May cause irritation to the nose, throat and upper respiratory tract. May cause central nervous system effects. Ingestion of large amounts may cause nausea, vomiting, diarrhea, as well as depression of the central nervous system. May be an aspiration hazard. Aspiration into the lungs during swallowing or subsequent vomiting may cause chemical pneumonitis, which can be fatal.
Potential environmental effects	See ECOLOGICAL INFORMATION, Section 12.

3. Composition / Information on Ingredients

Hazardous components	**CAS #**	**Percent**
Diisobutyl Ketone	108-83-8	80-95
Non-hazardous components	**CAS #**	**Percent**
2-heptanone, 4,6-dimethyl-	19549-80-5	10-15
2,6-dimethyl-4-heptanol	108-82-7	<2

4. First Aid Measures

First aid procedures

Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
Skin contact	Take off immediately all contaminated clothing. Wash off immediately with plenty of water for at least 15 minutes. Get medical advice/attention if you feel unwell. Wash contaminated clothing before reuse.
Inhalation	Move to fresh air. If breathing is difficult, give oxygen. If breathing stops, provide artificial respiration. Get medical attention, if needed.
Ingestion	Rinse mouth. Do not induce vomiting. Never give anything by mouth to a victim who is unconscious or is having convulsions.
Notes to physician	Treat symptomatically. This product is a CNS depressant. Aspiration hazard.
General advice	If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire Fighting Measures

Flammable properties	Combustible by WHMIS criteria. Combustible liquid and vapor. Heat may cause the containers to explode. Runoff to sewer may cause fire or explosion hazard. Material will float on water and can be re-ignited at the water's surface.

Extinguishing media

Suitable extinguishing media	Use media suitable to the surrounding fire such as water fog or fine spray, alcohol foams, carbon dioxide and dry chemical.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.

Protection of firefighters

Specific hazards arising from the chemical	The product is combustible, and heating may generate vapors which may form explosive vapor/air mixtures. After prolonged storage, may release explosive peroxides in the presence of air.
Protective equipment for firefighters	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.
Fire fighting equipment/instructions	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Evacuate area and fight fire from a safe distance. Move containers from fire area if you can do so without risk. Use water spray to cool unopened containers.
Specific methods	Cool containers exposed to flames with water until well after the fire is out.

Explosion data

Sensitivity to static discharge	May be sensitive to static discharge.
Sensitivity to mechanical impact	Not expected to be sensitive to mechanical impact.
Hazardous combustion products	Burning will produce toxic fumes containing carbon monoxide and carbon dioxide. Other irritating fumes and smoke.
General fire hazards	Material will float on water and can be re-ignited at the water's surface.

6. Accidental Release Measures

Personal precautions	Ventilate the contaminated area. Ensure adequate ventilation. Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the MSDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.
Methods for containment	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Stop the flow of material, if this is without risk. Take precautionary measures against static discharge. Use only non-sparking tools. Use water spray to reduce vapors or divert vapor cloud drift. Keep combustibles (wood, paper, oil, etc.) away from spilled material. Dike the spilled material, where this is possible. Prevent entry into waterways, sewer, basements or confined areas.
Methods for cleaning up	Ventilate the contaminated area. Extinguish all flames in the vicinity. Wear appropriate protective equipment and clothing during clean-up. Stop the flow of material, if this is without risk. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Dike the spilled material, where this is possible. For waste disposal, see section 13 of the MSDS.

Other information Clean up in accordance with all applicable regulations.

7. Handling and Storage

Handling Use only outdoors or in a well-ventilated area. Do not use in areas without adequate ventilation. Keep away from open flames, hot surfaces and sources of ignition. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use only non-sparking tools. Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. When using, do not eat, drink or smoke. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

Storage Store locked up. Do not handle or store near an open flame, heat or other sources of ignition. Keep away from heat and sources of ignition. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Keep container tightly closed. Store in original tightly closed container. Store away from incompatible materials. Store in a cool, dry place out of direct sunlight. Store in a well-ventilated place. After prolonged storage, may release explosive peroxides in the presence of air.

8. Exposure Controls / Personal Protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Components	Type	Value
Diisobutyl Ketone (CAS 108-83-8)	TWA	25 ppm

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Diisobutyl Ketone (CAS 108-83-8)	PEL	290 mg/m3 50 ppm

Biological limit values No biological exposure limits noted for the ingredient(s).

Engineering controls Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Ensure adequate ventilation, especially in confined areas. Eye wash facilities and emergency shower must be available when handling this product.

Personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles). Face shield is recommended. Eye wash fountain is recommended.

Skin protection Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

Respiratory protection If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. A NIOSH/MSHA approved air-purifying respirator with the appropriate chemical cartridges or a positive-pressure, air-supplied respirator may be used to reduce exposure. Advice should be sought from respiratory protection specialists.

Hand protection Gloves impervious to the material are recommended. Neoprene or butyl rubber gloves are recommended. Advice should be sought from glove suppliers.

9. Physical & Chemical Properties

Appearance Clear, colorless liquid with mild odor.

Physical state Liquid.

Form Liquid.

Color Colorless

Odor Mild.

Odor threshold 0.11 ppm

pH Not available.

Vapor pressure 2.3 mbar

Vapor density 4.9

Boiling point 325.4 °F (163 °C)

Melting point/Freezing point	-42.7 °F (-41.5 °C) estimated
Solubility (water)	Insoluble
Specific gravity	0.81
Relative density	Not available.
Flash point	120.0 °F (48.9 °C)
Flammability limits in air, upper, % by volume	6.2 %
Flammability limits in air, lower, % by volume	0.8 %
Auto-ignition temperature	745 °F (396.11 °C)
Evaporation rate	Not available.
Partition coefficient (n-octanol/water)	Not available.
Other data	
Density	0.81 g/cm3

10. Chemical Stability & Reactivity Information

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport. May form explosive mixtures with air.
Chemical stability	Material is stable under normal conditions.
Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources. Contact with incompatible materials. Do not use in areas without adequate ventilation. Exposure to air.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	None known, refer to hazardous combustion products in Section 5. The following may be released during a fire: Carbon oxides. Other irritating fumes and smoke.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Toxicological data

Components	Species	Test Results
2,6-dimethyl-4-heptanol (CAS 108-82-7)		
Acute		
Dermal		
LD50	Rabbit	4591 mg/kg
Inhalation		
LC50	Rat	No Data in Literature
Oral		
LD50	Rat	3560 mg/kg
2-heptanone, 4,6-dimethyl- (CAS 19549-80-5)		
Acute		
Dermal		
LD50	Rabbit	No Data in Literature
Inhalation		
LC50	Rat	No Data in Literature
Oral		
LD50	Rat	No Data in Literature
Diisobutyl Ketone (CAS 108-83-8)		
Acute		
Dermal		
LD50	Rabbit	6120 mg/kg
Inhalation		
LC50	Rat	> 14.5 mg/l

Components	Species	Test Results
Oral		
LD50	Rat	5750 mg/kg

Acute effects This product is not classified as an acute toxicity hazard. See data for individual ingredient acute toxicity data.

Sensitization Not expected to be a skin or respiratory sensitizer.

Chronic effects Not expected to be hazardous by WHMIS criteria. Chronic skin contact with low concentrations may cause dermatitis. Prolonged or repeated overexposure may cause liver and kidney effects.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

Skin corrosion/irritation Direct skin contact may cause slight or mild, transient irritation.

Serious eye damage/irritation Direct contact may cause very mild, temporary irritation and redness.

Mutagenicity Not expected to be mutagenic.

Reproductive effects This product is not expected to cause reproductive or developmental effects.

Teratogenicity This product is not expected to be a teratogen.

Symptoms and target organs Direct eye contact may cause slight or mild, transient irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Direct skin contact may cause slight or mild, transient irritation. Symptoms may include redness, edema, drying, defatting and cracking of the skin. May cause irritation to the nose, throat and upper respiratory tract. May cause central nervous system effects. Ingestion of large amounts may cause nausea, vomiting, diarrhea, as well as depression of the central nervous system. May be an aspiration hazard. Aspiration may occur during swallowing or vomiting, resulting in lung injury.

Epidemiology No epidemiological data is available for this product.

Synergistic materials Not available.

12. Ecological Information

Ecotoxicological data

Components		Species	Test Results
2,6-dimethyl-4-heptanol (CAS 108-82-7)			
Aquatic			
Acute			
Algae	EC50	Green algae (Selenastrum capricornutum)	19.62 mg/l, 72 hours
Crustacea	LC50	Water flea (Daphnia magna)	47.8 mg/l, 48 hours
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	28.6 mg/l, 96 hours
Diisobutyl Ketone (CAS 108-83-8)			
Aquatic			
Acute			
Algae	EC50	Green Algae (Pseudokirchneriella subcapitata)	46.9 mg/l, 72 hours
Crustacea	EC50	Water flea (Daphnia magna)	37.2 mg/l, 48 hours
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	30 mg/l, 96 hours

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Environmental effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Aquatic toxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and degradability No data is available on the degradability of this product.

Mobility in environmental media The product is immiscible with water.

13. Disposal Considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Dispose in accordance with all applicable regulations.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport Information

TDG

UN number	UN1157
UN proper shipping name	DIISOBUTYL KETONE
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Packing group	III
Environmental hazards	Not available.
Special precautions for user	Read safety instructions, MSDS and emergency procedures before handling.

IATA

UN number	UN1157
UN proper shipping name	DIISOBUTYL KETONE
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Packing group	III
Environmental hazards	No.
ERG Code	3L
Special precautions for user	Read safety instructions, MSDS and emergency procedures before handling.
Other information	
Passenger and cargo aircraft	Allowed.
Cargo aircraft only	Allowed.

IMDG

UN number	UN1157
UN proper shipping name	DIISOBUTYL KETONE
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Packing group	III
Environmental hazards	
Marine pollutant	No.
EmS	F-E, S-D
Special precautions for user	Read safety instructions, MSDS and emergency procedures before handling.

IATA; IMDG; TDG

15. Regulatory Information

Canadian regulations This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS status Controlled

WHMIS classification B3 - Combustible Liquids

WHMIS labeling

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other Information

HMIS® ratings
Health: 2*
Flammability: 2
Physical hazard: 0

NFPA ratings
Health: 2
Flammability: 2
Instability: 0

Disclaimer
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Legend to abbreviations and acronyms used in the SDS

ACGIH: American Conference of Governmental Industrial Hygienists
CEPA: Canadian Environmental Protection Act
DSL: Domestic Substance List
HMIS: Hazardous Materials Identification System
HPA: Hazardous Protection Act
HSDB® - Hazardous Substances Data Bank
IARC: International Agency for Research on Cancer
IATA: International Air Transport Association
IMDG: International Maritime Dangerous Goods
IUCLID: International Uniform Chemical Information Database
LC: Lethal Concentration
LD: Lethal Dose
MSDS: Material Safety Data Sheet
NFPA: National Fire Protection Association
NIOSH: National Institute of Occupational Safety and Health
NTP: National Toxicology Program
OECD: Organisation for Economic Co operation and Development
OEL: National occupational exposure limits
OSHA: Occupational Safety and Health Administration
PPE: Personal Protective Equipment
STEL: Short Term Exposure Limit
TDG: Canadian Transportation of Dangerous Goods Act & Regulations
TLV: Threshold Limit Values
TWA: Time Weighted Average

References

Canadian Centre for Occupational Health and Safety, CCInfoWeb Databases, 2014 (Chempendium, RTECs, HSDB, INCHEM)
European Chemicals Agency, Classification Legislation, 2014.
Material Safety Data Sheet from manufacturer.
OECD - The Global Portal to Information on Chemical Substances - eChemPortal, 2014.