

Material Safety Data for: Acetone

1. PRODUCT IDENTIFICATION

Name	dimethyl ketone
Synonyms	2-propanone, acetone
CAS#	67-64-1
Europe EC#	200-662-2
Product Uses	solvent in coatings & adhesives; chemical intermediate; reagent

2. INGREDIENTS

	%	TWAEV / TLV ppm / mg/m ³	LD ₅₀ ORAL	(mg/kg) SKIN	LC ₅₀ ppm INHALATION
dimethyl ketone	100%	500 / 1200	3000	7400	18,600

3. (a) HAZARDS SUMMARY

Hazards, Quick Guide: flammable liquid, heavy vapour may travel, distant ignition and flashback are possible, irritating to skin and eyes, suspected reproductive toxin

Canada – WHMIS

Key:

B 2, D 2B

B 2 – Flash Point <38°C, B 3 – Flash Point >38°C & <93°C

D 1 – Immediately Toxic, D 2 – Chronic Toxicity

C – Oxidising Substance, E – Corrosive

U.S.A. – HMIS

Key:

Health – 1, Fire – 3, Reactivity – 0

0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe

3. (b) HAZARDS – TOXICITY

Effects, Acute Exposure

Skin Contact	may be slightly irritating; powerful solvent for skin oils
Skin Absorption	yes; no toxic effects likely by this route, <i>except possibly in very young children</i>
Eye Contact	vapour irritating at 1000ppm; liquid severely irritating
Inhalation	irritating above 1000ppm; above 2000ppm dizziness, intoxication, nausea, vomiting; over 10,000ppm is life threatening
Ingestion	irritating to mouth & throat; dizziness, intoxication, nausea; <i>200ml taken deliberately by an adult: intoxication, 12 hour coma, 4 weeks of diabetic symptoms, & complete recovery</i>

Effects, Chronic Exposure

General	prolonged exposure may cause dermatitis & skin cracking; systemic effects of prolonged inhalation appear to be minor and subtle
Sensitising	not a sensitiser in humans or animals
Carcinogen/Tumorigen	not considered a tumorigen or a carcinogen in humans or animals
Reproductive Effect	no known effect in animals; one human study suggested sperm abnormality may occur on prolonged exposure, but simultaneous exposure to styrene makes acetone contribution impossible to ascertain
Mutagen	no known effect on humans or animals
Synergistic With	potentiates toxic effects of halogenated hydrocarbons; may potentiate toxicity of ethanol
LD ₅₀ (oral)	5240, 5800 & 6700mg/kg (rat), 5340mg/kg (rabbit), 3000mg/kg (mouse), 8000mg/kg (dog),
LD ₅₀ (skin)	>16,000mg/kg (rabbit), 7400mg/kg (guinea pig)
LC ₅₀ (inhalation)	21,000 & 30,000ppm (rat), 18,600ppm (mouse)

Please ensure that this MSDS is given to, and explained to people using this product.

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4. FIRST AID

- SKIN: Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.
- EYES: Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.
- INHALATION: Remove from contaminated area promptly. **CAUTION: Rescuer must not endanger himself!** If breathing stops, administer artificial respiration and seek medical aid promptly.
- INGESTION: Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

5. PHYSICAL PROPERTIES

Odour & Appearance	clear, colourless liquid with sharp ketone (nail-polish remover) odour
Odour Threshold	60ppm – varies widely among individuals
Vapour Pressure	185mmHg / 24.7kPa (20°C / 68°F)
Evaporation Rate (<i>Butyl Acetate</i> = 1)	5.6
Vapour Density (air = 1)	2
Boiling Range	56°C / 133°F
Freezing Point	-95°C / -138°F
Specific Gravity	0.792 (20/20°C)
Water Solubility	complete
Also soluble in	most organic solvents
Viscosity	0.32centipoise (25°C / 77°F)
pH	none – (<i>does not liberate hydrogen ions when dissolved</i>)
Conversion Factor	1ppm = 2.37mg/m ³
Molecular Weight	58grams per mole

6. FLAMMABILITY & FIRE FIGHTING

Flash Point	-20°C / -4°F (closed cup); also reported as -18°C / 0°F
Autoignition Temperature	465°C / 869°F
Flammable Limits	2.5% – 12.8%
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
Fire Fighting Precautions	alcohol-resistant foam, dry chemical, CO ₂ , water fog or spray only to cool & dilute, product floats on water – water jet spreads flames; fire fighters must wear SCBA
Static Charge Accumulation	cannot accumulate a static charge on agitation or pumping

7. STABILITY / REACTIVITY

Dangerously Reactive With	strong oxidising agents; strong reducing agents; hexachloromelamine or trichloromelamine mixture of nitric acid & acetic acid explodes with acetone, may ignite on contact with activated carbon
Also Reactive With	hydrogen peroxide causes formation of explosive cyclic peroxidases; isoprene and acetone may form peroxides; combination of alkalis & chlorinated solvents; sulphur dichloride; attacks polyvinyl chloride, ABS, & other elastomers
Stability	stable; will not polymerize
Decomposes in Presence of	not known
Decomposition Products	none apart from Hazardous Combustion Products
Sensitive to Mechanical Impact	no

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8. PROTECTIVE EQUIPMENT / EXPOSURE CONTROL

ACGIH TLV	500ppm / 1187mg/m ³
OSHA PEL	1000ppm / 2400mg/m ³
STEL ACGIH)	750ppm / 1780mg/m ³
Ventilation	mechanical ventilation may be required to maintain airborne titre below regulated limits
Hands	butyl rubber gloves recommended – <i>other types may also protect; consult supplier to confirm suitability</i>
Eyes	safety glasses with side shields – <i>always protect the eyes</i>
Clothing	wear impermeable (above) apron, boots, & long sleeves if there is any danger of splashing

9. HANDLING & STORAGE

Store in a cool, dry environment, away from sources of ignition, heat and substances named in Part 7. **Never keep drums in direct sun!** *Always use non-sparking bronze or aluminium hand tools. All electrical and mechanical equipment (including lighting, switchgear and forklift trucks) used with or around this product must be explosion-proof.*

Although acetone cannot retain a static charge on agitation or transfer from one container to another, it's flash point is very low & it is **extremely flammable**. It is prudent to ground or electrically bond the source container, the receiving container, and the transfer pump before transferring contents. **Never transfer by pressurising containers with air!** Avoid splashing by ensuring that the product nozzle is below the surface in the receiving container. Empty containers may contain a flammable/explosive vapour. Always ensure that containers, whether empty or full, or part full, are tightly sealed unless in use.

Avoid breathing product vapour. Use with adequate ventilation. If dealing with a spill, and ventilation is impossible or impractical, wear a suitable respirator with an organic vapour canister.

Never cut, drill, weld or grind on or near this container. Avoid contact with skin and wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

10. SPILL PROCEDURES

Serious Fire Potential: blanket spill with foam as a precaution against accidental ignition. Take extreme care to avoid sparks – do not operate (turn on OR off) electrical appliances near spill, unless explosion proof.

Leak Precaution	dyke to control spillage and prevent environmental contamination
Handling Spill	ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep & pick up using plastic or aluminium shovel, & store in closed containers for recycling or disposal

11. DISPOSAL

Waste Disposal	do not flush to sewer , recycle solvent if possible, may be incinerated in approved facility
Containers	Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. Pails must be vented and thoroughly dried prior to crushing and recycling. IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years. <i>Never cut, drill, weld or grind on or near this container, even if empty</i>

12. ENVIRONMENTAL INFORMATION

Bioaccumulation	this product is rapidly excreted and/or metabolised and cannot bioaccumulate
Biodegradation	this product degrades readily and rapidly in the presence of oxygen; ~80% biodegradation in 2 weeks
Abiotic Degradation	this product reacts slowly with atmospheric hydroxyl radicals; its estimated half-life in air is ~70 days
Mobility in soil, water	acetone moves readily in soil & water; volatilisation is rapid, mitigating rapid mobility

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Aquatic Toxicity

LC ₅₀ (Fish, 96hr)	11,000mg/litre (Alburnus alburnus), 6210-8120mg/litre (Pimephales promelas), 5540mg/litre (Salmo gairdneri),
EC ₅₀ (Crustacea, 48hr)	7635mg/litre (Daphnia cucullata), 12,600mg/litre (Daphnia magna), 8800mg/litre (Daphnia pulex), 16,700mg/litre (Nitocra spinipes)
EC ₅₀ (Algae, 14 day)	2844mg/litre (Anabena cylindrica), 21,725mg/litre (Anabena inaequalis), 29151mg/litre (Anabena variabilis), 11,798mg/litre (Skeletonema costatum)
EC ₅₀ (Bacteria)	59-67mg/litre (domestic activated sewage sludge), 14,500mg/litre (Photobacterium phosphoreum), & others

13. TRANSPORT REGULATIONS

Canada TDG	PIN	UN-1090
AND	Shipping Name	acetone
U.S.A. 49 CFR	Class	3
	Packing Group	II
Marine Pollutant		not a marine pollutant

14. EMERGENCY INFORMATION

Canada	Call CANUTEC (collect)	(613) 996-6666
U.S.A.	Call CHEMTREC	(800) 424-9300

15. REGULATIONS

Canada DSL	on inventory
U.S.A. TSCA	on inventory
Europe EINECS	on inventory

Immediately Dangerous to Life or Health: 2500 ppm (IDLH based on a 10% of the lower explosive limit for safety considerations even though the relevant toxicological data indicated that irreversible health effects or impairment of escape existed only at higher concentrations.)

Allowable Tolerances: Residues of acetone are exempted from the requirement of a tolerance when used as a solvent, cosolvent in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest.

OSHA Standards: Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 1000 ppm (2400 mg/cu m). Vacated 1989 OSHA PEL TWA 750 ppm (1800 mg/cu m); STEL 1000 ppm (2400 mg/cu m) is still enforced in some states.

NIOSH Recommendations: Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 250 ppm (590 mg/cu m).

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 500 ppm; 15 min Short Term Exposure Limit (STEL): 750 ppm. A4; Not classifiable as a human carcinogen. Biological Exposure Index (BEI): Determinant: urine acetone; Sampling Time: end of shift; BEI: 50 mg/L. The determinant is nonspecific, since it is also observed after exposure to other chemicals.

Atmospheric Standards: This action promulgates standards of performance for equipment leaks of Volatile Organic Compounds (VOC) in the Synthetic Organic Chemical Manufacturing Industry (SOCMI). The intended effect of these standards is to require all newly constructed, modified, and reconstructed SOCMI process units to use the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, non air quality health and environmental impact and energy requirements. Acetone is produced, as an intermediate or a final product, by process units covered under this subpart.

State Drinking Water Guidelines: Florida 700 ug/l, Massachusetts 3000 ug/l, Minnesota 700 ug/l, New Hampshire 700 ug/l, Wisconsin 1000 ug/l, Maine 700 ug/l

CERCLA Reportable Quantities: Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately, when there is a release of this designated hazardous substance, in an amount equal to or greater than its reportable quantity of 5000 lb or 2270 kg. The toll free number of the NRC is (800) 424-8802. The rule for determining when notification is required is stated in 40 CFR 302.4 (section IV. D.3.b).

RCRA Requirements: When acetone is a spent solvent, it is classified as a hazardous waste from a nonspecific source, as stated in 40 CFR 261.31, and must be managed according to State and/or Federal hazardous waste regulations. As stipulated in 40 CFR 261.33, when acetone, as a commercial chemical product or manufacturing chemical intermediate or an off-specification commercial chemical product or a manufacturing chemical intermediate, becomes a waste, it must be managed according to Federal and/or State hazardous waste regulations. Also defined as a hazardous waste is any residue, contaminated soil, water, or other debris resulting from the cleanup of a spill, into water or on dry land, of this waste. Generators of small quantities of this waste may qualify for partial exclusion from hazardous waste regulations (40 CFR 261.5).

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FIFRA Requirements: Residues of acetone are exempted from the requirement of a tolerance when used as a solvent, cosolvent in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest. As the federal pesticide law FIFRA directs, EPA is conducting a comprehensive review of older pesticides to consider their health and environmental effects and make decisions about their future use. Under this pesticide reregistration program, EPA examines health and safety data for pesticide active ingredients initially registered before November 1, 1984, and determines whether they are eligible for reregistration. In addition, all pesticides must meet the new safety standard of the Food Quality Protection Act of 1996. Pesticides for which EPA had not issued Registration Standards prior to the effective date of FIFRA '88 were divided into three lists based upon their potential for human exposure and other factors, with List B containing pesticides of greater concern and List D pesticides of less concern. Acetone is found on List D. Case No: 4002; Case Status: No products containing the pesticide are actively registered. Therefore, we are characterizing the case as "cancelled." Under FIFRA, pesticide producers may voluntarily cancel their registered products. EPA also may cancel pesticide registrations if registrants fail to pay required fees or make/meet certain reregistration commitments, or if EPA reaches findings of unreasonable adverse effects.; Active ingredient (AI): acetone; AI Status: The active ingredient is no longer contained in any registered products. Thus, we characterize it as "cancelled."

FDA Requirements: A tolerance of 30 parts per million is established for acetone in spice oleoresins when present therein as a residue from the extraction of spice. Acetone is an indirect food additive for use only as a component of adhesives. Drug products containing certain active ingredients offered over-the-counter (OTC) for certain uses. A number of active ingredients have been present in OTC drug products for various uses, as described below. However, based on evidence currently available, there are inadequate data to establish general recognition of the safety and effectiveness of these ingredients for the specified uses: acetone is included in skin protectant drug products.

16. PREPARATION INFORMATION

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With data from RTECS, Haz. Substance Data Base, Cheminfo (CCOHS), IUCILID Datasheets (European Chem. Substance Info. System), & others, as available

*Preparation Date: **March 2004** Revision Date: **April 2007, April 2010***

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