Material Safety Data Sheet
Methyl ethyl ketone

ACC# 14460

Section 1 - Chemical Product and Company Identification

MSDS Name: Methyl ethyl ketone
Catalog Numbers: AC327911000, S80081, S93303, M208-1, M208-20, M208-4, M209-1, M209-20, M209-200, M209-4, M209-500, M209FB115, M209FB19, M209FB200, M209FB50, M209RB115, M209RS19, M209RS200, M209RS28, M209RS50, M209S-4, M209S4, M209SS115, M209SS200, M209SS28, M209SS50
Synonyms: 2-Butanone; Ethyl methyl ketone; MEK; Methyl ethyl ketone.
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
78-93-3	Methyl ethyl ketone	>99	201-159-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless liquid. Flash Point: -7 deg C.
Danger! Extremely flammable liquid and vapor. Vapor may cause flash fire. Breathing vapors may cause drowsiness and dizziness. Causes eye irritation. Repeated exposure may cause skin dryness or cracking. Aspiration hazard if swallowed. Can enter lungs and cause damage.
Target Organs: Central nervous system, eyes, skin.

Potential Health Effects
Eye: Causes eye irritation. Vapors cause eye irritation. Animal evidence suggests that MEK is a moderate to severe eye irritant.
Skin: May be absorbed through the skin in harmful amounts. Repeated or prolonged exposure may cause drying and cracking of the skin. Only one human case of skin sensitization was located. Negative results were obtained in an animal test; MEK did not produce skin sensitization in the mouse ear thickness test.
Ingestion: May cause irritation of the digestive tract. Possible aspiration hazard. May cause central nervous system depression. Animal evidence suggests that MEK can be aspirated (inhaled) into the lungs during ingestion or vomiting.
Inhalation: Causes respiratory tract irritation. Inhalation of vapors may cause drowsiness and dizziness. May cause central nervous system effects such as nausea and headache. Neurobehavioural effects of exposure to MEK (200 ppm for 4 hrs) were studied with 137 volunteers. There were no statistically significant effects observed in biochemical, psychomotor, sensorimotor and psychological tests.
Chronic: Chronic inhalation may cause effects similar to those of acute inhalation. Prolonged or repeated skin contact may cause defatting and dermatitis. Animal studies have reported that fetal effects/abnormalities may occur when maternal toxicity is seen. Chronic overexposure to vapors may cause lung damage.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid.
Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.
Ingestion: Potential for aspiration if swallowed. Get medical aid immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If vomiting occurs naturally, have victim lean forward.
Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Extremely flammable liquid and vapor. Vapor may cause flash fire. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.
Extinguishing Media: In case of fire, use carbon dioxide, dry chemical powder or appropriate foam. Water may be ineffective because it will not cool material below its flash point.
Flash Point: -7 deg C (19.40 deg F)
Autoignition Temperature: 404 deg C (759.20 deg F)
Explosion Limits, Lower:1.4 vol%@93°C
Upper: 11.4 vol%@93°C

NFPA Rating: (estimated) Health: 1; Flammability: 3; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Avoid breathing vapor.
Storage: Keep away from sources of ignition. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Ventilation fans and other electrical service must be non-sparking and have an explosion-proof design.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Methyl ethyl ketone	200 ppm TWA; 300 ppm STEL	200 ppm TWA; 590 mg/m3 TWA 3000 ppm IDLH	200 ppm TWA; 590 mg/m3 TWA

OSHA Vacated PELs: Methyl ethyl ketone: 200 ppm TWA; 590 mg/m3 TWA
Personal Protective Equipment
Eyes: Wear chemical splash goggles.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: colorless
Odor: sweetish odor - acetone-like
pH: Not available.
Vapor Pressure: 77.5 mm Hg @ 20 deg C
Vapor Density: 2.41 (air=1)
Evaporation Rate:3.7 (nBuAc=1)
Viscosity: 0.41 cps @ 20 deg C
Boiling Point: 80 deg C @ 760 mmHg
Freezing/Melting Point:-87 deg C
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density:0.8050 g/ml
Molecular Formula:C4H8O
Molecular Weight:72.11

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Becomes yellow over time.
Conditions to Avoid: Ignition sources, excess heat, confined spaces.
Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, 2-propanol.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, peroxides.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 78-93-3: EL6475000
LD50/LC50:

CAS# 78-93-3:
Draize test, rabbit, eye: 80 mg;
Draize test, rabbit, skin: 500 mg/24H Moderate;
Draize test, rabbit, skin: 402 mg/24H Mild;
Inhalation, mouse: LC50 = 32 gm/m3/4H;
Inhalation, rat: LC50 = 23500 mg/m3/8H;
Oral, mouse: LD50 = 3000 mg/kg;
Oral, rat: LD50 = 2737 mg/kg;
Skin, rabbit: LD50 = 6480 mg/kg;
.

Carcinogenicity:
CAS# 78-93-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: Embryo or Fetus: fetotoxicity, ihl-rat TCLo=1000 ppm. Specific Developmental Abnormalities: craniofacial and urogenital, ihl-rat TCLo=3000 ppm/7H; musculoskeletal, ihl-rat TCLo=1000 ppm.
Reproductive Effects: No information available.
Mutagenicity: Sex chromosome loss/non-disjunction: S. cerevisiae 33800 ppm.
Neurotoxicity: Exposure of rats 8 hours/day, 7 days/week at 6000 ppm MEK did not result in any obvious motor impairment; however, all rats died from bronchopneumonia in the 7th week. Exposure of cats to MEK did not induce neuropathy. Experimental animal studies haveshown that MEK in mixtures with methyl n-butyl ketone, n-hexane, and 2,5-hexanedione, enhanced the development of neuropathies or increases their severity. Where synergism or potentiation may occur, stringent control of the primary toxin is recommended.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: LC50 = 3220 mg/L; 96 Hr; UnspecifiedFish: Bluegill/Sunfish: LC50 = 1690 mg/L; 96 Hr; UnspecifiedBacteria: Phytobacterium phosphoreum: EC50 = 51.9 mg/L; 25 min; Microtox testBacteria: Phytobacterium phosphoreum: EC50 =3373 mg/L; 30 min; Microtox test No data available.
Environmental: Substance evaporates in water with T1/2= 3D (rivers) to 12D (lakes). Substance is not expected to bioconcentrate in aquatic organisms.
Physical: Substance photodegrades in air with T1/2 = 2.3 days. Oxidizes rapidly by photo-chemical reactions in air. Readily biodegradable meeting the 10 day window criterion. Not expected to bioaccumulate significantly.
Other: None information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 78-93-3: waste number U159 (Ignitable waste, Toxic waste).

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	ETHYL METHYL KETONE	ETHYL METHYL KETONE
Hazard Class:	3	3
UN Number:	UN1193	UN1193
Packing Group:	II	II
Additional Info:		FLASHPOINT -7 C

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 78-93-3 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 78-93-3: Effective 10/4/82, Sunset 10/4/92
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
CAS# 78-93-3: 5000 lb final RQ; 2270 kg final RQ
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 78-93-3: immediate, delayed, fire.
Section 313 No chemicals are reportable under Section 313.

Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 78-93-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols:
XI F
Risk Phrases:
R 11 Highly flammable.
R 36 Irritating to eyes.
R 66 Repeated exposure may cause skin dryness or cracking.
R 67 Vapours may cause drowsiness and dizziness.

Safety Phrases:
S 16 Keep away from sources of ignition - No smoking.
S 9 Keep container in a well-ventilated place.

WGK (Water Danger/Protection)
CAS# 78-93-3: 1
Canada - DSL/NDSL
CAS# 78-93-3 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of B2, D2B.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
Canadian Ingredient Disclosure List
CAS# 78-93-3 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 7/21/1999
Revision #8 Date: 6/06/2006