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**** MATERIAL SAFETY DATA SHEET ****

Methyl Ethyl Ketone
14460

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Methyl Ethyl Ketone

Catalog Numbers:
AC149670200, AC149670250, AC9565367, S80081, BP209RB-115, BP209RB-19, BP209RB-200, BP209RB-50, BP209RS-200, BP209RS-50, BFM209RB-115, BFM209RB-19, BFM209RB-200, BFM209RB-50, BFM209RS-200, BFM209RS-28, BFM209RS-50, DWM2084, H209RB115, H209RB19, H209RB200, M208 1, M208 20, M208 4, M208-1, M208-20, M208-4, M2081, M20820, M2084, M209 1, M209 20, M209 4, M209 500, M209-1, M209-20, M209-200, M209-4, M209-500, M2091, M20920, M209200, M20920LC, M2094, M2094LC, M209500, M209FB115, M209FB19, M209FB200, M209FB50, M209RB115, M209RB19, M209RB200, M209RS115, M209RS200, M209RS50, M209S 4, M209S-4, M209S4, M209SS115, M209SS200, M209SS28, M209SS50

Synonyms:
Acetone, methyl-; Butanone; 2-Butanone; Butanone 2; 3-Butanone; Ketone, ethyl methyl; MEK; Methyl acetone

Company Identification: Fisher Scientific
1 Reagent Lane
Fairlawn, 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	%	EINECS#
78-93-3	Methyl Ethyl Ketone	>99%	201-159-0

Hazard Symbols: XI F
Risk Phrases: 11 36 66 67

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: colorless liquid. Flash Point: -7 deg C.
Danger! Extremely flammable liquid. May cause respiratory tract irritation. May cause central nervous system effects. May cause severe eye and skin irritation with possible burns. May cause digestive tract irritation with nausea, vomiting, and diarrhea. May cause fetal effects.
Target Organs: Central nervous system.

Potential Health Effects

Eye: Causes eye irritation. May result in corneal injury.

Skin: May be absorbed through the skin in harmful amounts. Prolonged and/or repeated contact may cause irritation and/or dermatitis.

Ingestion: May cause irritation of the digestive tract. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. Irritation may lead to chemical pneumonitis and pulmonary edema. May cause numbness in the extremities.

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.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed.

Skin: Get medical aid. Rinse area with large amounts of water for at least 15 minutes. Remove contaminated clothing and shoes.

Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If

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breathing is difficult, give oxygen. DO NOT use mouth-to-mouth respiration. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician:
Treat symptomatically and

**** 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. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Flammable Liquid. Can release vapors that form explosive mixtures at temperatures above the flashpoint. Use water spray to keep fire-exposed containers cool. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. May polymerize explosively when involved in a fire. Containers may explode when heated.

Extinguishing Media:

For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Do NOT use straight streams of water. Cool containers with flooding quantities of water until well after fire is out.

**** 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., dry sand or earth), then place into a chemical waste container. Avoid runoff into storm sewers and ditches which lead to waterways. 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:

Use only in a well ventilated area. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, grill, grind, or expose empty containers to heat, sparks or open flames.

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.

Chemical Name	Exposure Limits		
	ACGIH	NIOSH	OSHA - Final PELs
Methyl Ethyl Ketone	200 ppm; 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 appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin

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Respirators: exposure.

Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Liquid
Appearance: colorless liquid
Odor: sweetish odor - alcohol-like
pH: Not available.
Vapor Pressure: 71.2 mm Hg
Vapor Density: 2.5 (Air=1)
Evaporation Rate: 2.7 (Ether=1)
Viscosity: 0.42 mPas 15 de
Boiling Point: 80 deg C @ 760.00mm Hg
Freezing/Melting Point: -87 deg C
Autoignition Temperature: 404 deg C (759.20 deg F)
Flash Point: -7 deg C (19.40 deg F)
NFPA Rating: (est.) Health: 1; Flammability: 3; Reactivity: 0
Explosion Limits, Lower: 1.80 vol %
Upper: 11.50 vol %
Decomposition Temperature:
Solubility: miscible with oils
Specific Gravity/Density: .8050g/cm3
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.
Conditions to Avoid:
Incompatible materials, ignition sources, excess heat.
Incompatibilities with Other Materials:
Amines, ammonia, caustics, chloroform + alkali, chlorosulfonic acid, copper, hydrogen peroxide + nitric acid, inorganic acids, isocyanates, potassium-t-butoxide, 2-propanol, pyridines, strong oxidizers, and fuming sulfuric acid.
Hazardous Decomposition Products:
Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#: CAS# 78-93-3: EL6475000
LD50/LC50:
CAS# 78-93-3: Inhalation, mouse: LC50 = 40 gm/m3/2H; Inhalation, rat: LC50 = 23500 mg/m3/8H; Oral, mouse: LD50 = 4050 mg/kg; Oral, rat: LD50 = 2737 mg/kg; Skin, rabbit: LD50 = 6480 mg/kg.
Carcinogenicity:
Methyl Ethyl Ketone -
Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
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.
Neurotoxicity:
No information available.
Mutagenicity:
Sex chromosome loss/non-disjunction: S. cerevisiae 33800 ppm.
Other Studies:
See actual entry in RTECS for complete information.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:
Fish: Fathead Minnow: LC50 = 3220 mg/L; 96 Hr; Unspecified Fish: Bluegill/Sunfish: LC50 = 1690 mg/L; 96 Hr; Unspecified Bacteria: Phytobacterium phosphoreum: EC50 = 51.9 mg/L; 25 min; Microtox test Bacteria: Phytobacterium phosphoreum: EC50 = 3373 mg/L; 30 min; Microtox test Fathead minnow LC50=3220 mg/L/96H Bluegill TLM=5640 to 1690 mg/L/24 to 96H

**** 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 Part 261.24. Additionally, waste generators must consult state and local hazardous waste regu

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ensure complete and accurate classification.
RCRA F-Series: None listed.
RCRA U-Series: CAS# 78-93-3; waste number U159;
(Ignitable waste, Toxic waste).

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT
Shipping Name: ETHYL METHYL KETONE
Hazard Class: 3
UN Number: 1193
Packing Group: II
Canadian TDG
Shipping Name: METHYL ETHYL KETONE
Hazard Class: 3
UN Number: UN1193
Other Information: FLASHPOINT -9C

**** 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 Date: October 4, 1982; Sunset Date: October 4, 1992
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.

SARA

Section 302 (RQ)
CAS# 78-93-3: final RQ = 5000 pounds (2270 kg)
Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 78-93-3: acute, flammable.
Section 313
This material contains Methyl Ethyl Ketone (CAS# 78-93-3, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.
Clean Air Act:
CAS# 78-93-3 is listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depleters.
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

Methyl Ethyl Ketone can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.
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 Vapors may cause drowsiness and dizziness.
Safety Phrases:
S 9 Keep container in a well-ventilated place.
S 16 Keep away from sources of ignition - No smoking.

WGK (Water Danger/Protection)

CAS# 78-93-3: 1
United Kingdom Occupational Exposure Limits
CAS# 78-93-3: OES-United Kingdom, TWA 200 ppm TWA; 600 mg/m3 TWA
CAS# 78-93-3: OES-United Kingdom, STEL 300 ppm STEL; 899 mg/m3 STEL
Canada

CAS# 78-93-3 is listed on Canada's DSL/NDSL List.
This product has a WHMIS classification of B2, D2A.
CAS# 78-93-3 is not listed on Canada's Ingredient Disclosure List.
Exposure Limits
CAS# 78-93-3: OEL-AUSTRALIA:TWA 150 ppm (445 mg/m3); STEL 300 ppm (890 mg/m3)
OEL-AUSTRIA:TWA 200 ppm (590 mg/m3)

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OEL-BELGIUM:TWA 200 ppm (590 mg/m3);STEL 300 ppm (885 mg/m3)
OEL-DENMARK:TWA 100 ppm (290 mg/m3);Skin
OEL-FINLAND:TWA 150 ppm (440 mg/m3);STEL 190 ppm;Skin
OEL-FRANCE:TWA 200 ppm (600 mg/m3);Skin
OEL-GERMANY:TWA 200 ppm (590 mg/m3)
OEL-HUNGARY:TWA 200 mg/m3;STEL 600 mg/m3
OEL-INDIA:TWA 200 ppm (590 mg/m3);STEL 300 ppm (885 mg/m3)
OEL-JAPAN:TWA 200 ppm (590 mg/m3)
OEL-THE NETHERLANDS:TWA 200 ppm (590 mg/m3)
OEL-THE PHILIPPINES:TWA 200 ppm (590 mg/m3)
OEL-POLAND:TWA 200 mg/m3
OEL-RUSSIA:TWA 200 ppm;STEL 200 mg/m3
OEL-SWEDEN:TWA 50 ppm (150 mg/m3);STEL 100 ppm (300 mg/m3)
OEL-SWITZERLAND:TWA 200 ppm (590 mg/m3);STEL 400 ppm
OEL-TURKEY:TWA 200 ppm (590 mg/m3)
OEL-UNITED KINGDOM:TWA 200 ppm (590 mg/m3);STEL 300 ppm
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 7/21/1999 Revision #3 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.