MATERIAL SAFETY DATA SHEET

EMERGENCY PHONE (504) 344-7147

66.0.1

PRODUCT IDENTIFICATION

TRADE NAME:	MOTOR FUEL ANTIKNOCK COMPOUND	
SYNONYMS:	Alkyl Lead Compound	TEL Motor Antiknock
	Antiknock Compound	TML Antiknock
	Lead Antiknock Compound	Tetraethyl Lead
	PM Antiknock Dilutes	Tetramethyl Lead
	TEL Aviation Antiknock	MLA Antiknock
CHEMICAL FAMILY:	Organic lead, tetralkyl plumbanes.	
CHEMICAL FORMULA:	$(C_2H_5)_4Pb$ (TEL) $(CH_3)_4Pb$ (TML).	
MOLECULAR WEIGHT:	323.45 (TEL).	
CAS NAME:	Non-specific. Mixture containing tetraalkyl lead such as tetraethyl and/or tetramethyl lead (TEL or TML) with one or more halogen compounds such as ethylene dibromide or ethylene dichloride and hydrocarbon solvents.	
CAS NO.:	See "Hazardous Components" section.	

THIS MATERIAL COMPLIES WITH THE TOXIC SUBSTANCE CONTROL ACT (15 USC 2601-2629).

HAZARDOUS COMPONENTS

	CAS NO.	%
Tetraethyl Lead	78-00-2	1-61
Tetramethyl Lead	75-74-1	1-51
Diethyldimethyl Lead - in MLA only	1762-27-2	12-23
Ethyltrimethyl Lead - in MLA only	1762-26-1	2-24
Triethylmethyl Lead - in MLA only	1762-28-3	2-27
Ethylene Dichloride	107-06-2	5-19
Ethylene Dibromide	106-93-4	5-36
Toluene	108-88-3	1-13
Kerosene	8008-20-6	1-3
Xylene - In Dilute Solutions Only	1330-20-7	49-50
N-Heptane - In Dilute Solutions Only	142-82-5	21

CHEMICAL & PHYSICAL PROPERTIES

APPEARANCE/ODOR:	Dyed red, orange or blue liquid with a sweet and/or musty odor.
ODOR THRESHOLD:	1/3 of TLV.
BOILING POINT:	93 - 149°C @ 760 mm Hg. (Calculated).
MELTING POINT:	-137 -30°C (TEL & TML)
SPECIFIC GRAVITY (@ 20°C):	0.9 - 1.7
VAPOR PRESSURE mm Hg (@ 20°C/68°F):	5 - 41
VAPOR DENSITY:	4 - 7 (air = 1.0).
SOLUBILITY IN WATER:	0.002 wt % @ 1°C (as lead alkyl).
PERCENT VOLATILES:	99 wt. % @ 20°C.
EVAPORATION RATE:	1.0 (Water = 1.0).

FIRE & EXPLOSION HAZARDS

FLASH POINT (METHOD):	13 - 108°C (TCC). (Closed cup flash points for MFAC are meaningless because of unpredictable trace amounts of low boilers present.)
AUTOIGNITION TEMPERATURE:	(TEL) 127°C.
AUTO DECOMPOSITION TEMPERATURE:	(TEL) 220°C.
EXTINGUISHING MEDIA:	Dry chemical, water spray, chemical foam or carbon dioxide. Remote activation preferred.
SPECIAL FIRE FIGHTING PROCEDURES:	Evacuate personnel to a safe area. Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus. Wear full-protective equipment (eye, body, respiratory). Use water spray. Cool tank/container with water spray.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	Mixtures may be flammable or combustible depending upon type of lead alkyl and/or diluents. Hazardous gases produced in fire are inorganic lead fumes; hydrogen halides.

REACTIVITY DATA

STABILITY:	Stable. Unstable with heat.
HAZARDOUS DECOMPOSITION:	Decomposes with heat. Decomposition temperature 100°C - 150°C. Hazardous gases produced are inorganic lead fumes, hydrogen halides.
MATERIALS TO AVOID:	Strong oxidizing agents, halogens and concentrated acids.
HAZARDOUS POLYMERIZATION:	Will not occur.

HEALTH HAZARDS

This product contains skin irritants, eye irritants, and is untested for animal sensitization.

ORGANIC LEAD COMPONENTS:

Toxic effects expected in animals from short exposures by inhalation, ingestion, or skin contact would be largely attributable to the organic lead ingredients and would include central nervous system effects and liver effects. Tetraethyl lead does not have reproductive effects. Embryotoxic effects are seen only at exposure levels at which significant maternal toxicity occur. Otherwise, no chronic toxicity information is available.

Human health effects of overexposure by inhalation, ingestion, or skin or eye contact determined by the organic lead ingredients may initially include: subtle central nervous system effects such as insomnia or mood changes, progressing - with continued or higher exposure - to toxic psychosis with delirium, convulsions or coma. Higher exposures may lead to: nonspecific discomfort, such as nausea, headache, or weakness; abnormal liver function as detected by laboratory tests; pulmonary edema; or fatality from gross over exposure by either neurologic effects or pulmonary edema. Skin permeation can occur in amounts capable of producing the effects of systemic toxicity. There are no reports of human sensitization. Individuals with preexisting diseases of the central nervous system may have increased susceptibility to the toxicity of excessive exposures.

Ethyl recommends handling products containing organic lead compound as potential human developmental toxins, and states that the employment of women of childbearing potential in operations involving direct exposure to lead compounds should be avoided; however, contact with products containing trace quantities and exposure to airborne levels equivalent to normal ambient background levels are permitted.

ETHYLENE DIBROMIDE:

Toxic effects described in animals from short exposures by inhalation, ingestion, or skin contact include liver and lung effects. Tests in some animals demonstrate carcinogenic activity. Tests in bacterial or mammalian cell cultures demonstrate mutagenic activity. Tests for reproductive toxicity in animals have been inconclusive, with positive results in some studies, and negative results in others.

Human health effects of overexposure by inhalation, ingestion, or skin or eye contact may include: non-specific discomfort, such as nausea, headache, or weakness; eye irritation with discomfort and tearing or blurring of vision; abnormal liver function with nausea or vomiting, reduced appetite, or abdominal pain or irritation of the upper respiratory passages. Skin permeation can occur in amounts capable of producing the effects of systemic toxicity. Epidemiologic studies do not demonstrate a significant risk of human cancer from exposure to this compound.

Toxic effects described in aminals from short exposures by inhalation, ingestion or skin contact include liver, central nervous system, and kidney effects; temporary alteration of the heart's electrical activity with irregular pulse, palpitations or inadequate circulation; or possibly modest initial symptoms followed in hours by severe shortness of breath requiring prompt medical attention; and nonspecific effects such as weight loss and irritation. Tests in some animals demonstrate carcinogenic activity. Tests in bacterial or mammalian cell cultures demonstrate mutagenic activity. Animal testing indicates that this compound does not have embryotoxic, nor reproductive effects.

HEALTH HAZARDS - Continued

ETHYLENE DICHLORIDE:

Human health effects of overexposure by inhalation, ingestion, skin or eye contact may include: nose and throat irritation, anesthetic effects with headache and confusion, progressing with higher exposure to unconsciousness; nonspecific discomfort, such as nausea, headache, or weakness; abnormal liver or kidney function as detected by laboratory tests. Skin premeation can occur in amounts capable of producing the effects of systemic toxicity. There are no reports of human sensitization. Epidemiologic studies do not demonstrate a significant risk of human cancer from exposure to this compound. Individuals with preexisting diseases of the liver may have increased susceptibility to the toxicity of excessive exposures.

KEROSENE:

Toxic effects described in animals from short exposures by inhalation, ingestion, or skin contact include lung and kidney effects, and narcosis. No animal test reports are available to define carcinogenic, embryotoxic, or reproductive hazards. Tests in bacterial or mammalian cell cultures demonstrate no mutagenic activity.

Human health effects of overexposure by inhalation, ingestion, or skin or eye contact may initially include: nonspecific discomfort, such as nausea, headache, or weakness; abnormal kidney function as detected by laboratory tests; or temporary lung irritation effects with cough, discomfort, difficulty breathing, or shortness of breath. Higher exposures may lead to these effects: temporary nervous system depression with anesthetic effects such as dizziness, headache confusion, incoordination, and loss of consciousness; possibly modest initial symptoms, followed in hours by severe shortness of breath, requiring prompt medical attention or fatality from gross overexposure. Skin premeation can occur in amounts capable of producing the effects of systemic toxicity. There are no reports of human sensitization. Individuals with preexisting diseases of the liver, or kidneys may have increased susceptibility to the toxicity of excessive exposures.

TOLUENE:

Toxic effects described in animals from exposure by inhalation, include neurologic depression, reversible liver changes, increased cardiac susceptibility to the arrythmogenic effects of adrenalin, and bone marrow effect. Animal testing indicates that this compound does not have carcinogenic, mutagenic, embryotoxic, nor reporductive effects.

Human health effects of overexposure by inhalation, ingestion, or skin or eye contact may initially include: abnormal liver function as detected by laboratory tests; temporary nervous depression with anesthetic effects such as dizziness, headache, and confusion; irritation of the upper respiratory passages; and eye irritation with discomfort, tearing, or blurring of vision. Higher exposure may lead to these effects: non-specific discomfort, such as nausea, headache, or weakness; nervous system depression with anesthetic effects such as incoordination and loss of consciousness; abnormal kidney function as detected by laboratory tests; or fatality from gross overexposure. Significant skin premeation appears unlikely. There are no reports of human sensitization. Individuals with preexisting diseases of the central nervous system, cardiovascular system, liver, kidneys, or bone marrow may have increased susceptibility to the toxicity of of excessive exposures.

(Toluene is an ingredient only in antiknock compounds containing tetramethy lead.)

HEALTH HAZARDS - Continued

XYLENE:

Toxic effects described in animals from exposure by inhalation include liver and central nervous system effects. Tests in animals demonstrate no carcinogenic activity. Tests in bacterial and mammalian cell cultures demonstrate no mutagenic activity. Tests in animals demonstrate embryotoxic activity. Tests in rats demonstrate increased numbers of morphologically abnormal sperm at high dosage levels.

Human health effects of overexposure by inhalation, ingestion, or skin or eye contact may initially include: eye irritation with discomfort, tearing, or blurring of vision; nonspecific discomfort, such as nausea, headache, or weakness; and temporary nervous system depression with anaesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness. Higher exposures may lead to fatality from gross overexposure. Evidence suggests that skin permeation can occur in amounts capable of producing the effects of systemic toxicity. There are no reports of human sensitization. Individuals with preexisting diseases of the central nervous system or liver may have increased susceptibility to the toxicity of excessive exposures.

(Xylene and n-Heptane are used only as the diluents in dilute solutions of anitknock compound packaged in one liter cans.)

n-HEPTANE:

Human health effects of overexposure by inhalation, ingestion or skin or eye contact may include: eye irritation with discomfort; skin irritation upon prolonged or repeated contact, respiratory tract irritation with narcosis in high concentrations. Toxic effects in animals occuring only with inhalation exposures are anesthetic effects, kidney, brain and central nervous system effects, respiratory effects and non-specific effects such as weight loss and irritation.

ANIMAL DATA

TETRAETHYL LEAD:	Inhalation 1 hour LC 50:	0.85 mg/1 in rats.
	Skin absorption LD50:	200 - 1500 mg/kg in rabbits.
	Oral LD50:	29 mg/kg in rats

Highly toxic by inhalation (4 hour LC50 10 - 100 ppm; 0.08 - 0.8 mg/1).
Moderately toxic by contact (LD50 200 - 5000 mg/kg).
Highly toxic by ingestion (oral LD50 5 - 500 mg/kg).

TETRAMETHYL LEAD:	Inhalation 1 hour LD50:	greater than 8.9 mg/1.
	Skin absorption LD50:	6200 mg/kg in rabbits.
	Oral LD50:	108 mg/kg in rats.

Moderately toxic by inhalation (4 hour LD50 100 - 1000 ppm; 0.8 - 8 mg/1).
Slightly toxic by contact (LD50 5000 - 10,000 mg/kg).
Moderately toxic by ingestion (oral LD50 - 500 mg/kg).

ANIMAL DATA - Continued

ETHYLENE DIBROMIDE:	Inhalation 2 hour ALD:	200 ppm in rats.
	Skin absorption LD50:	300 mg/kg in rabbits.
	Oral LD50:	140 mg/kg in rats.

Moderately toxic by inhalation (4 hour LD50 100 - 1000 ppm; 0.08 - 8 mg/1).
Moderately toxic by contact (LD50 200 - 5000 mg/kg).
Moderately toxic by ingestion (Oral LD50 50 - 500 mg/kg).

ETHYLENE DICHLORIDE:	Inhalation 4 hour LC50:	2100 ppm in rats.
	Skin absorption LD50:	2800 mg/kg in rabbits.
	Oral LD50:	680 mg/kg in rats.

Slightly toxic by inhalation (4 hour LD50 1000 - 5000 ppm; 8 - 50 mg/1).
Moderately toxic by contact (LD50 200 - 5000 mg/kg).
Slightly toxic by ingestion (oral LD50 500 - 5000 mg/kg).

KEROSENE:	Oral LD50:	20,400 mg/kg in guinea pigs.

Very low toxicity by ingestion (oral LD50 greater than 5000 mg/kg).

XYLENE:	Inhalation 6 hour LC50:	3907 ppm in mice.
	Skin absorption LD50:	No information found.
	Oral ALD:	4400 mg/kg in rats.

Very low toxicity by inhalation (4 hour LC50 greater than 5,000; greater than 40/mb/1).
Slightly toxic by ingestion (oral LD50 500 - 5000 mg/kg).

CARCINOGENICITY

The following ingredients are listed by IARC, NTP, or OSHA as carcinogens:		IRAC	NTP	OSHA
CHEMICAL:	Ethylene Dichloride		X	
	Ethylene Dibromide	X	X	X

EXPOSURE LIMITS

	TWA_8 (Ethyl)	TLV (ACGIH)	PEL (OSHA)	WEEL (AIHA)
TETRAETHYL LEAD		0.1 mg/m^3 as Pb, skin.	0.075 mg/m^3, skin.	Not established.
TETRAMETHYL LEAD		0.15 mg/m^3 as Pb, skin.	0.075 mg/m^3, skin.	Not established.
ETHYLENE DIBROMIDE	0.1 ppm.	A2, skin.	20 ppm TWA_8. 30 ppm Ceiling.	Not established.
ETHYLENE DICHLORIDE		10 ppm, 40 mg/m^3.	50 ppm TWA_8. 100 ppm Ceiling. 200 ppm - 5 min. max.	
KEROSENE		Not established.	Not established.	Not established.
TOLUENE		100 ppm, 375 mg/m^3. STEL 150 ppm, 560 mg/m^3.	Not established.	Not established.
XYLENE		100 ppm, 435 mg/m^3, STEL 150 ppm, 655 mg/m^3, skin.	100 ppm, 435 mg/m^3.	Not established
n-HEPTANE		400 ppm, 1600 mg/m^3 STEL 150 ppm, 2000 mg/m^3	400 ppm, 1600 mg/m^3.	Not established.

SAFETY PRECAUTIONS

Do not breathe vapor or mist. Do not get in eyes. Do not get on skin. Do not get on clothing. Wash thoroughly after handling. Wash clothing after use. Discard shoes if contaminated.

FIRST AID

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Get medical attention.

EYE CONTACT: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

SKIN CONTACT: In case of contact, immediately flush skin with kerosene and wash with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Get medical attention.

INGESTION: If swallowed, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person. Get medical attention.

PROTECTIVE INFORMATION

GENERALLY APPLICABLE CONTROL MEASURES AND PROCEDURES:

Use a totally enclosed system. Use only with adequate ventilation. Keep away from heat, sparks and flames. Keep container tightly closed. Do not mix with strong oxidizers, halogens, concentrated acids. Do not consume food, drink or tabacco in the areas where they may become contaminated with this material. Move with vacuum.

PERSONAL PROTECTIVE EQUIPMENT:

Chemical goggles.

NIOSH approved organic vapor respirator. In emergency situation, NIOSH approved self contained breathing apparatus (SCBA).

Protective footwear - Neoprene or PVC.

Protective gloves - Neoprene or PVC.

AQUATIC TOXICITY

TETRAETHYL LEAD:	Extremely toxic (96 hr LC50 less than 0.5 mg/1). The 96 hour LC50 in bluegill fish is 0.15 ppm.
TETRAMETHYL LEAD:	Highly toxic (96 hr LC50 0.5 - 1 mg/1). The 96 hour LC50 in fathead minnows is 19.3 ppm.
ETHYLENE DIBROMIDE:	Moderately toxic (96 hr LC50 1-50 mg/1). The 96 hour TLM in bluegill sunfish is 18 ppm.
ETHYLENE DICHLORIDE:	Slightly toxic (96 hr LC50 50-500 mg/1). The 96 hour LC50 in bluegill sunfish is 430 mg/1.
TOLUENE:	Moderately toxic (96 hr LC50 1-50 mg/1). The 96 hour LC50 in fathead minnows is 34-42 mg/1.
XYLENE:	Moderately toxic (96 hr LC50 1-50 mg/1). The 96 hour LC50 in fathead minnows is 27-42 mg/1.

DISPOSAL INFORMATION

SPILL/LEAK/RELEASE:	Superfund reportable discharge = 10 lbs. for Tetraethyl lead. Review fire and explosion hazards and safety precautions before proceeding with clean up. Use appropriate personal protective equipment during clean up. Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus. Remove source of heat sparks, flame, impact, friction or electricity. Keep upwind of leak - evacuate until gas has dispersed. If unable to extinguish fire, let burn until consumed. Dike spill. Prevent liquid from entering sewers, water ways or low area. Recover free liquid for reuse or reclamation. Soak up with sawdust, sand, oil, dry or other absorbent material. Neutralize small spills (less than 5 gal.) with 5% solution of Potassim Permanganate.
WASTE DISPOSAL:	Cleaned-up material is a RCRA Hazardous Waste. Treatment, storage, transportation and disposal must be in accordance with Federal, State, and local regulations. Recover for reclamation. Recover nonusable free liquid and/or contaminated water, and dispose of in an approved and permitted biological treatment system or an approved and permitted deepwell. Remove nonusable solid material and/or contaminated soil, for disposal in an approved and permitted landfill. Do not flush to surface water or sanitary sewer system. Contaminated soil can be decontaminated thermally by heating in an approved incinerator or furnace.
STORAGE CONDITIONS:	Do not store with explosives, flammable liquids or strong oxidizing agents. Store in well ventilated area. Keep container tightly closed. Do not store or consume food, drink or tobacco in area where they may become contaminated with this material. Provide cooling water for fire.

REVISED: 10/03/88 SUPERCEDES: 11/13/85

MSDS prepared by: Ethyl Corporation, Health and Environment Department

FOR ADDITIONAL NON-EMERGENCY MSDS INFORMATION, CONTACT:

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FOR ALL OTHER NON-EMERGENCY INFORMATION, CONTACT YOUR LOCAL ETHYL SALES REPRESENTATIVE.

THIS MATERIAL SAFETY DATA SHEET CONTAINS AT LEAST THE INFORMATION REQUIRED BY THE FEDERAL OSHA HAZARD COMMUNICATION RULE, COMM 29 CFR 1910.1200 (g) (2).

GS316

TRADE NAME: TEL DILUTE GRAM BASIS

ADDENDUM TO MSDS DATED: 3/07/89

MSDS ADDENDUM

Regulatory Information

SARA Title III, Section 313

This sheet has been prepared as a supplement to the Ethyl Corporation Material Safety Data Sheet. According to 40 CFR, Part 372, Subpart C, it must remain with the MSDS and all copies thereof. DO NOT DETACH!

This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372:

COMPONENT	CAS NUMBER	PERCENTAGE
Ethylene dibromide	106-93-4	<36.0
Ethylene dichloride	107-06-02	<19.0
Xylene	1330-20-7	<50.0
Tetraethyl lead	78-00-2	<62.0