SAFETY DATA SHEET

1. Identification

Product identifier	**Polyol Blend (Part A) - PM244**
Other means of identification	
SDS number	23177
Recommended use	Chemical intermediate
Recommended restrictions	None known.

Manufacturer/Importer/Supplier/Distributor information

Supplier

Company name	Lockheed Martin Missiles and Fire Control
Address	5600 Sand Lake Rd. Orlando, FL 32819-8907 US
Telephone number	General Information: 407-356-4547
e-mail	charles.p.mendez@lmco.com
Contact name	Charles P Mendez
Emergency telephone number	CHEMTREC: 800-424-9300

2. Hazard(s) identification

Physical hazards	Flammable liquids	Category 2
Health hazards	Acute toxicity, inhalation	Category 4
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 1
	Reproductive toxicity	Category 1B
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
	Specific target organ toxicity, repeated exposure	Category 2 (liver)
Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 2
	Hazardous to the aquatic environment, long-term hazard	Category 2

OSHA defined hazards Not classified.

Label elements

Signal word	Danger
Hazard statement	Highly flammable liquid and vapor. Harmful if inhaled. Causes skin irritation. Causes serious eye damage. May damage fertility or the unborn child. May cause respiratory irritation. May cause damage to organs (liver) through prolonged or repeated exposure. Toxic to aquatic life with long lasting effects.

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Do not breathe mist or vapor. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling. Avoid release to the environment.

Response In case of fire: Use appropriate media to extinguish. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. If exposed or concerned: Get medical advice/attention. Wash contaminated clothing before reuse. Collect spillage.

Storage Store in a well-ventilated place. Keep cool. Keep container tightly closed. Store locked up.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information

Harmful if swallowed - may enter lungs if swallowed or vomited.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Ether based polyols	Mixture	69.3
Methyl isobutyl ketone (MIBK)	108-10-1	22.3
3-Ethyl-2-methyl-2(3 methyl butyl)-1,3 oxazoldine	143860-04-2	4.1
Butylated hydroxyl toluene	128-37-0	1.5
2-Butanone (Methyl ethyl ketone)	78-93-3	1.4
Acetone	67-64-1	1.4

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen and monitor closely. Get medical attention immediately.

Skin contact Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

Eye contact Immediately flush with plenty of water for at least 15 minutes occasionally lifting upper and lower eyelids. If easy to do, remove contact lenses. Get medical attention.
In case of irritation from airborne exposure, move to fresh air. Get medical attention if symptoms persist.

Ingestion Call a physician or poison control center immediately. DO NOT induce vomiting. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head lower than the hips to help prevent aspiration.

Most important symptoms/effects, acute and delayed Headache. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation. Skin irritation. May cause redness and pain.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim warm. Keep victim under observation. Symptoms may be delayed.
Exposure may aggravate pre-existing skin or respiratory disorders. Persons with impaired kidney or liver function may be more susceptible to the effects of this material.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use a solid water stream as it may scatter and spread fire.
Specific hazards arising from the chemical	Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. During fire, gases hazardous to health may be formed such as: Carbon monoxide and carbon dioxide.
Special protective equipment and precautions for firefighters	Firefighters must use full bunker gear including NIOSH-approved (or equal), full-face, self-contained breathing apparatus (SCBA) operated in positive pressure mode.
Fire fighting equipment/instructions	In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. Appropriate personal protective equipment and clothing must be worn by responders. Approach fire from upwind to avoid hazardous vapors and toxic decomposition. If material on fire or involved in fire: Do not extinguish fire unless flow can be stopped or safely confined. Use water in flooding quantities only as fog. Solid streams of water may spread fire. Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible.
Specific methods	Use water spray to cool unopened containers. Prevent build-up of vapors or gasses to explosive concentrations.
General fire hazards	Highly flammable liquid and vapor. Vapors may cause a flash fire or ignite explosively.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Wear appropriate personal protective equipment (See Section 8).
Methods and materials for containment and cleaning up	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Take precautionary measures against static discharge. Use only non-sparking tools. Stop leak if you can do so safely. Absorb spill with appropriate sand, clay or other inert sorbent material, then place in appropriate waste container. Large Spills: Use water spray to disperse vapors and dilute spill to a nonflammable mixture. Prevent runoff from entering drains, sewers, or streams. Dike for later disposal.
Environmental precautions	Environmental manager should be informed of all releases, as necessary. Reporting of releases to appropriate regulatory agencies may be required.

7. Handling and storage

Precautions for safe handling	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. When using do not smoke. Explosion-proof general and local exhaust ventilation. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Do not get this material in contact with eyes. Do not breathe mist or vapor. Avoid contact with skin and clothing. Avoid prolonged exposure. Do not taste or swallow. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment (See Section 8). Wash thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

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

Components	Type	Value
2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)	PEL	590 mg/m3 200 ppm
Acetone (CAS 67-64-1)	PEL	2400 mg/m3 1000 ppm

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

Components	Type	Value
Methyl isobutyl ketone (MIBK) (CAS 108-10-1)	PEL	410 mg/m3
		100 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)	STEL	300 ppm	
	TWA	200 ppm	
Acetone (CAS 67-64-1)	STEL	750 ppm	
	TWA	500 ppm	
Butylated hydroxyl toluene (CAS 128-37-0)	TWA	2 mg/m3	Inhalable fraction and vapor.
Methyl isobutyl ketone (MIBK) (CAS 108-10-1)	STEL	75 ppm	
	TWA	20 ppm	

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)	STEL	885 mg/m3
		300 ppm
	TWA	590 mg/m3
		200 ppm
Acetone (CAS 67-64-1)	TWA	590 mg/m3
		250 ppm
Butylated hydroxyl toluene (CAS 128-37-0)	TWA	10 mg/m3
Methyl isobutyl ketone (MIBK) (CAS 108-10-1)	STEL	300 mg/m3
		75 ppm
	TWA	205 mg/m3
		50 ppm

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)	2 mg/l	MEK	Urine	*
Acetone (CAS 67-64-1)	50 mg/l	Acetone	Urine	*
Methyl isobutyl ketone (MIBK) (CAS 108-10-1)	1 mg/l	Methyl isobutyl ketone	Urine	*

* - For sampling details, please see the source document.

Exposure guidelines

US - California OELs: Skin designation

2-Butanone (Methyl ethyl ketone) (CAS 78-93-3) Can be absorbed through the skin.

Appropriate engineering controls Explosion-proof general and local exhaust ventilation. Ensure adequate ventilation, especially in confined areas. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles). Wear a full-face respirator, if needed.

Skin protection

Hand protection Wear protective gloves.

Other	Wear chemical-resistant gloves, footwear and protective clothing appropriate for risk of exposure. Contact glove manufacturer for specific information.
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. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA 29 CFR 1910.134. Respirator type: Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	When using do not smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	Clear to amber liquid.
Physical state	Liquid.
Form	Liquid.
Color	Clear to amber.
Odor	Solvent faint ketonic odor (based on MIBK).
Odor threshold	Not available.
pH	5 - 7 (Based on ether based polyols)
Melting point/freezing point	Not available.
Initial boiling point and boiling range	237.2 - 242.6 °F (114 - 117 °C) (Based on MIBK)
Flash point	59.9 °F (15.5 °C) TCC (Based on MIBK)
Evaporation rate	1.6 (Based on MIBK)
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	1.4 (Based on MIBK)
Flammability limit - upper (%)	8 (Based on MIBK)
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	16 mm Hg @ 58 °F (Based on MIBK)
Vapor density	3.5 @ Air =1 (Based on MIBK)
Relative density	0.9 - 1.16 (Based on ether based polyols)
Solubility(ies)	
Solubility (water)	Soluble to slightly soluble (Based on ether based polyols)
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	857.84 °F (458.8 °C) (Based on MIBK)
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Percent volatile	29.6 %

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions. Will generate heat upon reaction with isocyanate.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Contact with incompatible materials. Heat, sparks, flames, elevated temperatures.
Incompatible materials	Strong oxidizing agents.

Hazardous decomposition products Carbon monoxide. Carbon dioxide.

11. Toxicological information

Information on likely routes of exposure

Inhalation Harmful if inhaled. May cause respiratory irritation. High vapor concentrations may cause central nervous system effects.

Skin contact Causes skin irritation. Prolonged or repeated contact may dry skin and cause dermatitis.

Eye contact Causes serious eye damage.

Ingestion May be harmful if swallowed. Can enter lungs and cause damage.

Symptoms related to the physical, chemical and toxicological characteristics Headache. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation. Skin irritation. May cause redness and pain.

Information on toxicological effects

Acute toxicity Harmful if inhaled. May be harmful if swallowed. Can enter lungs and cause damage.

Components	Species	Test Results
Methyl isobutyl ketone (MIBK) (CAS 108-10-1)		
Acute		
Dermal		
LD50	Rabbit	> 16000 mg/kg
Inhalation		
LC50	Rat	8.2 mg/l, 4 Hours
Oral		
LD50	Rat	2080 mg/kg

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/eye irritation Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization Based on available data, the classification criteria are not met.

Skin sensitization Based on available data, the classification criteria are not met.

Germ cell mutagenicity Based on available data, the classification criteria are not met.

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

IARC Monographs. Overall Evaluation of Carcinogenicity

Butylated hydroxyl toluene (CAS 128-37-0)	3 Not classifiable as to carcinogenicity to humans.
Methyl isobutyl ketone (MIBK) (CAS 108-10-1)	2B Possibly carcinogenic to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Reproductive toxicity May damage fertility or the unborn child.

Specific target organ toxicity - single exposure May cause respiratory irritation.

Specific target organ toxicity - repeated exposure May cause damage to organs (liver) through prolonged or repeated exposure.

Aspiration hazard Based on available data, the classification criteria are not met.

Chronic effects Prolonged inhalation may be harmful. May cause damage to organs: Liver. Kidneys.

Further information Persons with impaired kidney or liver function may be more susceptible to the effects of this material.

12. Ecological information

Ecotoxicity Toxic to aquatic life with long lasting effects.

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

Bioaccumulative potential No data available.

Mobility in soil No data available.

Other adverse effects No data available.

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. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations. When this product as supplied is to be discarded as waste, it may meet the definition of a RCRA waste under 40 CFR 261.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
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	Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number	UN1245
UN proper shipping name	Flammable liquid (Methyl Isobutyl Ketone solution)
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Label(s)	3
Packing group	II
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Special provisions	IB2, T4, TP1
Packaging exceptions	150
Packaging non bulk	202
Packaging bulk	242
ERG number	127

IATA

UN number	UN1245
UN proper shipping name	Flammable liquid (Methyl isobutyl ketone solution)
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Packing group	II
Environmental hazards	Yes.
ERG Code	3L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number	UN1245
UN proper shipping name	FLAMMABLE LIQUID (METHYL ISOBUTYL KETONE SOLUTION)
Transport hazard class(es)	
Class	3
Subsidiary risk	-
Packing group	II
Environmental hazards	
Marine pollutant	Yes.
EmS	F-E, S-D
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not established.
General information	The transportation information provided represents the regulatory transport classification of the product without consideration to packaging, quantity, or modal restrictions and exceptions. It is the user's responsibility to determine the appropriate packaging and modal requirements and/or limitations for the product quantity being shipped.

15. Regulatory information

US federal regulations	This product is hazardous according to OSHA 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

CERCLA Hazardous Substance List (40 CFR 302.4)

2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)	LISTED
Acetone (CAS 67-64-1)	LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Methyl isobutyl ketone (MIBK)	108-10-1	22.3

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Methyl isobutyl ketone (MIBK) (CAS 108-10-1)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)	6714
Acetone (CAS 67-64-1)	6532
Methyl isobutyl ketone (MIBK) (CAS 108-10-1)	6715

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)	35 %WV
Acetone (CAS 67-64-1)	35 %WV
Methyl isobutyl ketone (MIBK) (CAS 108-10-1)	35 %WV

DEA Exempt Chemical Mixtures Code Number

2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)	6714
Acetone (CAS 67-64-1)	6532
Methyl isobutyl ketone (MIBK) (CAS 108-10-1)	6715

US state regulations

US. Massachusetts RTK - Substance List

2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)
Acetone (CAS 67-64-1)
Butylated hydroxyl toluene (CAS 128-37-0)
Methyl isobutyl ketone (MIBK) (CAS 108-10-1)

US. New Jersey Worker and Community Right-to-Know Act

2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)
Acetone (CAS 67-64-1)
Butylated hydroxyl toluene (CAS 128-37-0)
Methyl isobutyl ketone (MIBK) (CAS 108-10-1)

US. Pennsylvania Worker and Community Right-to-Know Law

2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)
Acetone (CAS 67-64-1)
Butylated hydroxyl toluene (CAS 128-37-0)
Methyl isobutyl ketone (MIBK) (CAS 108-10-1)

US. Rhode Island RTK

2-Butanone (Methyl ethyl ketone) (CAS 78-93-3)
Acetone (CAS 67-64-1)

Methyl isobutyl ketone (MIBK) (CAS 108-10-1)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Methyl isobutyl ketone (MIBK) (CAS 108-10-1)

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)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies 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, including date of preparation or last revision

Issue date 28-May-2015

Revision date -

Version # 01

Further information This Safety Data Sheet was prepared in accordance with OSHA 1910.1200 Hazard Communication Standard (HCS 2012).

NFPA ratings

References US. IARC Monographs on Occupational Exposures to Chemical Agents
HSDB® - Hazardous Substances Data Bank
National Toxicology Program (NTP) Report on Carcinogens

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