LUPEROX® DDM-9 DR

1. PRODUCT AND COMPANY IDENTIFICATION

Company

Arkema Inc.
900 First Avenue
King of Prussia, Pennsylvania 19406

Functional Additives

Customer Service Telephone Number: (800) 331-7654
(Monday through Friday, 8:00 AM to 5:00 PM EST)

Emergency Information

Transportation: CHEMTREC: (800) 424-9300
(24 hrs., 7 days a week)
Medical: Rocky Mountain Poison Center: (866) 767-5089
(24 hrs., 7 days a week)

Product Information

Product name: LUPEROX® DDM-9 DR
Synonyms: Not available
Molecular formula: Complex mixture
Chemical family: Organic peroxide - ketone peroxides
Product use: initiator/catalyst

2. HAZARDS IDENTIFICATION

Emergency Overview

Color: red
Physical state: liquid
Form: oily
Odor: sweet

***Classification of the substance or mixture:**
Organic peroxides, Type D, H242
Inhalation: Acute toxicity, Category 4, H332
Skin corrosion, Category 1B, H314
Serious eye damage, Category 1, H318
Reproductive toxicity, Category 1B, H360
Chronic aquatic toxicity, Category 2, H411

*For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labelling

Hazard pictograms:

Signal word: **Danger**

Hazard statements:

H242 : Heating may cause a fire.
H314 : Causes severe skin burns and eye damage.
H332 : Harmful if inhaled.
H360 : May damage fertility or the unborn child.
H411 : Toxic to aquatic life with long lasting effects.

Supplemental Hazard Statements:

Organic peroxide.
Hazardous decomposition may occur.

Precautionary statements:

Prevention:
P201 : Obtain special instructions before use.
P202 : Do not handle until all safety precautions have been read and understood.
P210 : Keep away from heat, sparks, open flames, hot surfaces. No smoking.
P220 : Keep and Store away from clothing and combustible materials.
P234 : Keep only in original container.
P261 : Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 : Wash skin thoroughly after handling.
P271 : Use only outdoors or in a well-ventilated area.
P273 : Avoid release to the environment.
P280 : Wear protective gloves and protective clothing and eye protection and face protection.
P281 : Use personal protective equipment as required.

Response:
P301 + P330 + P331 : IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 : IF ON SKIN (or hair): Remove or take off immediately all contaminated clothing. Rinse skin with water and shower.
P304 + P340 : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 : IF exposed or concerned: Get medical advice/ attention.
P310 : Immediately call a POISON CENTER or doctor.
P363 : Wash contaminated clothing before reuse.
P391 : Collect spillage.

Storage:
P405 : Store locked up.
P410 : Protect from sunlight.
P411 + P235 : Maximum storage temperature is specified on label and in section 7 of SDS. Keep cool.
P420 : Store away from other materials.

Disposal:
P501 : Dispose of contents or container to an approved waste disposal plant.

Supplemental information:

Potential Health Effects:
If swallowed, may cause severe irritation and injury to the mouth, throat and digestive tract.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	Wt/Wt	GHS Classification**
Propanoic acid, 2-methyl-, 2,2-dimethyl-1-(1-methylethyl)-1,3-propanediyl ester	6846-50-0	>= 57 - < 59 %	H412, H361
2-Butanone, peroxide	1338-23-4	>= 32 - < 34 %	H242, H302, H332, H314, H318
2,4-Pentanediol, 2-methyl-	107-41-5	>= 5.5 - < 6.5 %	H319
2-Butanone	78-93-3	>= 1 - < 2 %	H225, H319, H336
2-Pyrrolidinone, 1-methyl-	872-50-4	>= 0.2 - < 1 %	H227, H319, H335, H360

**For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1. Description of necessary first-aid measures:

Inhalation:
If inhaled, remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Skin:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

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

Ingestion:
If swallowed, DO NOT induce vomiting. Get medical attention immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

4.2. Most important symptoms/effects, acute and delayed:

For most important symptoms and effects (acute and delayed), see Section 2 (Hazard Statements and Supplemental Information if applicable) and Section 11 (Toxicology Information) of this SDS.

4.3. Indication of immediate medical attention and special treatment needed, if necessary:

Unless otherwise noted in Notes to Physician, no specific treatment noted; treat symptomatically.

Notes to physician:
Exposure to material may cause delayed lung injury resulting in pulmonary edema and pneumonitis. Exposed individuals should be monitored for 72 hours after exposure for the onset of delayed respiratory symptoms.

5. FIREFIGHTING MEASURES

Extinguishing media (suitable):
Water spray, Carbon dioxide (CO2), Foam, Dry chemical

Protective equipment:
Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand / NIOSH approved or equivalent).

Further firefighting advice:
Fight fire with large amounts of water from a safe distance.
Cool closed containers exposed to fire with water spray.
Closed containers of this material may explode when subjected to heat from surrounding fire.
After a fire, wait until the material has cooled to room temperature before initiating clean-up activities.
Do not allow run-off from fire fighting to enter drains or water courses.
Fire fighting equipment should be thoroughly decontaminated after use.

Fire and explosion hazards:
Contact with incompatible materials or exposure to temperatures exceeding the SADT may result in a self accelerating decomposition reaction with release of flammable vapors which may autoignite.
When burned, the following hazardous products of combustion can occur:
Carbon oxides
Hazardous organic compounds

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, Emergency procedures, Methods and materials for containment/clean-up:
Prevent further leakage or spillage if you can do so without risk. Evacuate area of all unnecessary personnel. Ventilate the area. Eliminate all ignition sources. Avoid generation of vapors. Contain and collect spillage with non-combustible absorbent material such as sodium bicarbonate, sodium carbonate, calcium carbonate, clean sand or non-acidic clay and then wet down (dampen) the mixture with water. DO NOT USE peat moss. DO NOT USE vermiculite. Sweep or scoop up using non-sparking tools and place into suitable properly labeled containers for prompt disposal. The sweepings should be wetted down further with water. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

Protective equipment:
Appropriate personal protective equipment is set forth in Section 8.

7. HANDLING AND STORAGE

Handling

General information on handling:
Contact with materials to avoid or exposure to temperatures exceeding the SADT may result in a self-accelerating decomposition reaction with release of flammable vapors which may autoignite.
Do not taste or swallow.
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Keep away from heat, sparks and flames.
No smoking.
Use only with adequate ventilation.
Wash thoroughly after handling.
Prevent product contamination.
Keep container tightly closed and away from combustible materials.
Keep only in the original container.
Do not reuse container as it may retain hazardous product residue.
Emptied container retains vapor and product residue.
Container hazardous when empty.
Improper disposal or reuse of this container may be dangerous and/or illegal.

Storage

General information on storage conditions:
Keep in a dry, cool place. Segregated or detached storage is preferred. Store in well ventilated area away from heat and sources of ignition such as flame, sparks and static electricity. Store out of direct sunlight in a cool well-ventilated place. Store in original container. Store in closed containers, in a secure area to prevent container damage and subsequent spillage. Store away from combustibles and materials to avoid. Refer also to National Fire Protection Association (NFPA) Code 400, Hazardous Materials Code.

Storage stability – Remarks:
Follow the recommended storage temperatures provided in this Section in order to maintain stability and oxygen content.

Storage incompatibility – General:
Store away from excessive heat, sources of ignition, and reactive materials.
Store separate from:
Strong acids
Strong bases
Strong oxidizing agents
Reducing agents
Accelerators
Friedel - Crafts reaction catalyst
transition metal salts
metal ions
Iron
Copper
Brass
For all Organic Peroxides, compatible materials of contact are stainless steel 304 or 316 (preferred), high-density polyethylene (HDPE), polytetrafluoroethylene or glass linings.

Temperature tolerance – Do not store above:
100 °F (38 °C)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne Exposure Guidelines:

2-Butanone, peroxide (1338-23-4)

US. ACGIH Threshold Limit Values

Ceiling Limit Value	0.2 ppm

2,4-Pentanediol, 2-methyl- (107-41-5)

US. ACGIH Threshold Limit Values

Form:	Aerosol, inhalable.
Short Term Exposure Limit (STEL):	10 mg/m3
Form:	Vapor fraction
Short Term Exposure Limit (STEL):	50 ppm
Form:	Vapor fraction
Time weighted average	25 ppm

2-Butanone (78-93-3)

US. ACGIH Threshold Limit Values

Time weighted average	200 ppm
Short Term Exposure Limit (STEL):	300 ppm

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

PEL:	200 ppm (590 mg/m3)

2-Pyrrolidinone, 1-methyl- (872-50-4)

US. OARS. WEELs Workplace Environmental Exposure Level Guide

Skin designation Remarks:	Can be absorbed through the skin.
Time weighted average	10 ppm (40 mg/m3)
Remarks:	Listed

Only those components with exposure limits are printed in this section. Limits with skin contact designation above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required. Limits with a sensitizer designation above mean that exposure to this material may cause allergic reactions.

Engineering controls:
Investigate engineering techniques to reduce exposures below airborne exposure limits or to otherwise reduce exposures. Provide ventilation if necessary to minimize exposures or to control exposure levels to below airborne exposure limits (if applicable see above).If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Consult ACGIH ventilation manual or NFPA Standard 91 for design of exhaust systems.

Respiratory protection:
Do not breathe vapor or mist. Where airborne exposure is likely or airborne exposure limits are exceeded (if applicable, see above), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Full facepiece equipment is recommended and, if used, replaces need for face shield and/or chemical goggles. Consult respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where there may be a potential for significant exposure or where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134. (in case of higher concentration)

Skin protection:
Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Wear chemical goggles, a face shield, and chemical resistant clothing such as a rubber apron when splashing may occur. Rinse immediately if skin is contaminated. Remove contaminated clothing immediately and wash before reuse. Clean protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash thoroughly after handling.

Eye protection:

Where there is potential for eye contact, wear a face shield, chemical goggles, and have eye flushing equipment immediately available.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color:	red
Physical state:	liquid
Form:	oily
Odor:	sweet
Odor threshold:	No data available
Flash point	203 °F (95 °C) (Setaflash closed cup)
Auto-ignition temperature:	No data available.
Lower flammable limit (LFL):	No data available
Upper flammable limit (UFL):	No data available
pH:	No data available
Density:	1.0076 g/cm3 (68 °F (20 °C))
Specific Gravity (Relative density):	1.0094 (68 °F(20 °C))Water=1 (liquid)
Vapor pressure:	5.20 mmHg (68 °F (20 °C))
Boiling point/boiling range:	Decomposes before boiling. Rate of decomposition increases with rising temperature.
Melting point/range:	No data available.
Freezing point:	No data available
Evaporation rate:	No data available
Solubility in water:	slightly soluble
Viscosity, dynamic:	17.6 mPa.s 68 °F (20 °C)
Oil/water partition coefficient:	No data available.
Self-Accelerating Decomposition	158 °F (70 °C) (Method: Heat Accumulation Storage Test)

Temperature (SADT):

Thermal decomposition: Decomposes on heating.

Active oxygen content: 8.7 - 9.0 %

Flammability: See GHS Classification in Section 2 if applicable

10. STABILITY AND REACTIVITY

Stability:
This material is chemically unstable and should only be handled under specified conditions. See HANDLING AND STORAGE section of this MSDS for specified conditions.

Hazardous reactions:
Hazardous polymerization does not occur.

Materials to avoid:
Strong acids
Strong bases
Strong oxidizing agents
Accelerators
Reducing agents
Friedel - Crafts reaction catalyst
transition metal salts
metal ions
Iron
Copper
Brass
For all Organic Peroxides, compatible materials of contact are stainless steel 304 or 316 (preferred), high-density polyethylene (HDPE), polytetrafluoroethylene or glass linings.

Conditions / hazards to avoid:
See HANDLING AND STORAGE section of this MSDS for specified conditions. SADT - Self Accelerating Decomposition Temperature. Lowest temperature at which the tested package size will undergo a self-accelerating decomposition reaction. This reaction will generate flammable vapors which may autoignite. The length of time to generate a decomposition reaction, after the SADT has been reached or exceeded, is dependent upon how much the SADT has been exceeded and the length of time needed for the reaction exotherm (heat spike from increasing decomposition rate) to initiate a rapid decomposition reaction. Typically, SADT is inversely proportional to package size. Larger packages will have a lower SADT due to smaller ratio to heat transfer area to volume of product.

Hazardous decomposition products:

Temperatures at or above SADT can result in the release of hazardous decomposition products which are flammable and may autoignite.
Thermal decomposition giving flammable and toxic products :
Carbon oxides
Hazardous organic compounds

11. TOXICOLOGICAL INFORMATION

Data on this material and/or its components are summarized below.

Data for LUPEROX® DDM-9 DR

Acute toxicity

Oral:
Acute toxicity estimate 3,040 mg/kg.

Dermal:
Acute toxicity estimate > 5,000 mg/kg.

Inhalation:
4 h Acute toxicity estimate 4.54 mg/l. (dust/mist)

Data for Propanoic acid, 2-methyl-, 2,2-dimethyl-1-(1-methylethyl)-1,3-propanediyl ester (6846-50-0)

Acute toxicity

Oral:
No deaths occurred. (rat) LD0 > 2,000 mg/kg.

Dermal:
No deaths occurred. (rabbit) LD0 > 2,000 mg/kg.

Inhalation:
No deaths occurred. (rat) 6 h LC0 > 5.3 mg/l. (saturated vapor)

Skin Irritation:
Not irritating. (rabbit) (4 h)

Eye Irritation:
Not irritating. (rabbit)

Skin Sensitization:
Not a sensitizer. Repeated skin exposure. (guinea pig) No skin allergy or irritation was observed.

Repeated dose toxicity
Subchronic dietary administration to rat / affected organ(s): kidney / signs: hyaline droplet nephropathy / (not considered relevant in humans)

Subchronic dietary administration to dog / No adverse systemic effects reported.

Genotoxicity

Assessment in Vitro:
No genetic changes were observed in laboratory tests using: bacteria, animal cells

Developmental toxicity
Reproductive/Developmental Effects Screening Assay. dietary (rat) / Birth defects were observed.

Reproductive effects
Reproductive/Developmental Effects Screening Assay. dietary (rat) / At high dose : levels produced toxic effects in the mothers and offspring

Human experience
Skin contact:
No skin allergy was observed. (studied using human volunteers)

Data for 2-Butanone, peroxide (1338-23-4)

Acute toxicity

Oral:
Harmful if swallowed. (rat) LD50 = 1,017 mg/kg. (35 - 39 %) (In solution in Dimethyl phthalate)

Dermal:
May be harmful in contact with skin. (rabbit) LD50 = 4,000 mg/kg. (35 - 39 %) (In solution in Dimethyl phthalate)

Inhalation:
Harmful if inhaled. (rat) 4 h LC50 = 1.5 mg/l. (40 %) (dust/mist, data for a similar material)

Skin Irritation:
Causes severe skin burns. (rabbit) (4 h) (33 %) (occluded exposure, In solution in Dimethyl phthalate)

Eye Irritation:
Causes serious eye damage. (rabbit) (33 - 39 %) (In solution in Dimethyl phthalate)

Skin Sensitization:
Not a sensitizer. Guinea pig maximization test. No skin allergy was observed (40 %) (In solution in Dimethyl phthalate)

Repeated dose toxicity
Repeated oral administration to rat / affected organ(s): Stomach, liver / signs: Irritation of the gastric mucosa, increased organ weight

Subchronic oral administration to rat / No adverse systemic effects reported.

Genotoxicity

Assessment in Vitro:
No genetic changes were observed in laboratory tests using: bacteria, animal cells

Genotoxicity

Assessment in Vivo:
No genetic changes were observed in laboratory tests using: mice

Developmental toxicity
Exposure during pregnancy. Oral (rat) / No birth defects were observed.

Reproductive effects
Reproductive/Developmental Effects Screening Assay. Oral (rat) / No toxicity to reproduction.

Human experience
Skin contact:
No skin allergy was observed. (studied using human volunteers)

Skin allergy was observed. Isolated case reports after exposure to a mixture containing this substance.

Human experience
Eye contact:
Eyes: Pain, tearing, sensitivity to light, irritation. Mist and/or vapor are reported to cause irritation when proper industrial hygiene controls/procedures are not used. (based on reports of occupational exposure to workers) (severity of effects depends on extent of exposure)

Eyes: Pain, causes severe burns. (accidental exposure to concentrated solutions) (based on reports of occupational exposure to workers) (severity of effects depends on extent of exposure)

Human experience
Ingestion:
Esophagus: Severe irritation, burns. (accidental exposure to concentrated solutions)

Data for 2,4-Pentanediol, 2-methyl- (107-41-5)

Acute toxicity

Oral:
No deaths occurred. (rat) LD0 > 2,000 mg/kg. signs: GI tract irritation, central nervous system depression

Dermal:
No deaths occurred. (rat) LD0 > 2,000 mg/kg.

Inhalation:
No deaths occurred. (rat) 8 h LC0 = 0.34 mg/l. (saturated vapor)

Skin Irritation:
Practically non-irritating. (rabbit) (4 h)

Eye Irritation:
Causes serious eye irritation. (rabbit)

Skin Sensitization:
Not a sensitizer. Guinea pig maximization test. No skin allergy was observed

Repeated dose toxicity
Subchronic oral administration to rat / affected organ(s): kidney, liver, Stomach / signs: Irritation of the gastric mucosa / No significant impairment of function.

Repeated inhalation administration to rat / affected organ(s): upper respiratory tract / Local irritation (Aerosol)

Genotoxicity

Assessment in Vitro:
No genetic changes were observed in laboratory tests using: bacteria, animal cells

Developmental toxicity
Exposure during pregnancy. Oral (rat) / No birth defects were observed. (delays in development, at doses that

produce effects in mothers)

Reproductive effects
Reproductive/Developmental Effects Screening Assay. Oral (rat) / No toxicity to reproduction. At high dose : Effects on offspring / (increased mortality in the offspring, decreased growth rate)

Human experience
Inhalation:
Discomfort. (severity of effects depends on extent of exposure) (studied using human volunteers)

Human experience
Skin contact:
No skin allergy was observed. (studied using human volunteers)

Local irritation, redness, swelling. (subjects with dermatitis or eczema)

Central nervous system depression. (severity of effects depends on extent of exposure)

Human experience
Eye contact:
Discomfort, slightly irritating. (liquid or aerosol) (studied using human volunteers) (severity of effects depends on extent of exposure)

Data for 2-Butanone (78-93-3)

Acute toxicity

Oral:
May be harmful if swallowed. (rat) LD50 = 2,600 mg/kg.

Dermal:
Practically nontoxic. (rabbit) LD50 > 6,400 mg/kg.

Inhalation:
Practically nontoxic. (rat) 4 h LC50 = 34.5 mg/l. (vapor)

Specific target organ toxicity - single exposure:
May cause drowsiness or dizziness.

Skin Irritation:
Causes mild skin irritation. (rabbit) (24 h)

Eye Irritation:
Causes serious eye irritation. (rabbit) Draize Test 21/110.

Skin Sensitization:
Not a sensitizer. Buehler method. (guinea pig) No skin allergy was observed

Repeated dose toxicity
Subchronic inhalation administration to rat / affected organ(s): liver / signs: blood chemistry changes, changes in organ weights

Repeated inhalation administration to rat, mouse, cat, chicken / no nervous system injuries

Carcinogenicity
Chronic dermal application administration to mouse / No increase in tumor incidence was reported.

Genotoxicity

Assessment in Vitro:
No genetic changes were observed in laboratory tests using: bacteria, animal cells, human cells

Both positive and equivocal responses have been reported in tests using: yeast

Genotoxicity

Assessment in Vivo:
No genetic changes were observed in laboratory tests using: mice, hamster

Developmental toxicity
Exposure during pregnancy. inhalation (mouse) / No birth defects were observed. (skeletal variations, delays in development)
Exposure during pregnancy. inhalation (rat) / No birth defects were observed. (delays in development, at doses that produce effects in mothers)

Reproductive effects
Reproduction test. drinking water (rat) / No toxicity to reproduction / (similar material)

Human experience
Inhalation:
Upper respiratory tract: irritation. (vapor)

Central nervous system: drowsiness, dizziness. Exposure to other materials makes the association questionable. (based on reports of occupational exposure to workers)

Nervous system: altered reflexes, changes in motor activity. Exposure to other materials makes the association questionable. (based on reports of occupational exposure to workers)

Human experience
Skin contact:
Skin: No skin allergy was observed. (studied using human volunteers)

Skin: dermatitis, cracking. Has a degreasing effect on the skin. (repeated or prolonged exposure)

Human experience
Eye contact:
Eyes: irritating. (vapor)

Data for 2-Pyrrolidinone, 1-methyl- (872-50-4)

Acute toxicity

Oral:
May be harmful if swallowed. (rat) LD50 = 4,150 mg/kg.

Dermal:
Practically nontoxic. (rat) LD50 > 5,000 mg/kg.

Inhalation:
Practically nontoxic. (rat) 4 h LC50 = 5.1 mg/l. (dust/mist)

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

Skin Irritation:
Practically non-irritating. (rabbit) (24 h) (occluded exposure)

Eye Irritation:
Causes serious eye irritation. (rabbit)

Skin Sensitization:
Not a sensitizer. Repeated skin exposure. (guinea pig) No skin allergy was observed

Repeated dose toxicity
Subchronic dietary administration to rat / signs: reduced body weight

Subchronic inhalation administration to rat / signs: reduced body weight

Repeated dermal administration to rabbit / signs: severe irritation

Carcinogenicity
Chronic inhalation administration to rat / No increase in tumor incidence was reported.

Chronic dietary administration to mouse / affected organ(s): liver / Increased incidence of tumors was reported. (not considered relevant to humans)

Chronic dietary administration to rat / No increase in tumor incidence was reported.

Genotoxicity

Assessment in Vitro:
Generally, no genetic changes were observed in laboratory studies using: bacteria, animal cells

Genotoxicity

Assessment in Vivo:
No genetic changes were observed in laboratory tests using: mouse, hamster

Developmental toxicity
Exposure during pregnancy. Oral (rabbit) / Birth defects were observed. (at doses that produce effects in mothers)
Exposure during pregnancy. Oral (rat) / Toxic effects for foetal development
Exposure during pregnancy. Inhalation (rat, rabbit) / No birth defects were observed.
Exposure during pregnancy. Dermal (rat) / Birth defects were observed. Toxic effects for foetal development (at doses that produce effects in mothers)

Reproductive effects
Two-generation study. oral (rat) / No toxicity to reproduction

Human experience
General:
Central nervous system effects: headache, nausea, dizziness, drowsiness, loss of consciousness.

Human experience
Inhalation:
Upper respiratory tract: coughing, irritation, sneezing. (studied using human volunteers)

Human experience
Skin contact:
skin: dermatitis, blistering, cracking, swelling. (based on reports of occupational exposure to workers)

No skin allergy was observed.

Human experience
Eye contact:
Eye: irritating, visual disturbances. (based on reports of occupational exposure to workers)

12. ECOLOGICAL INFORMATION

Chemical Fate and Pathway
Data on this material and/or its components are summarized below.

Data for Propanoic acid, 2-methyl-, 2,2-dimethyl-1-(1-methylethyl)-1,3-propanediyl ester (6846-50-0)

Biodegradation:
Not readily biodegradable. (aerobic, 28 d) biodegradation 71 % / The 10 day time window criterion is not fulfilled.

Bioaccumulation:
= 195 (Lepomis macrochirus (Bluegill sunfish))

Octanol Water Partition Coefficient:
log Pow: = 4.04 - 4.91(Method: calculated)

Data for 2-Butanone, peroxide (1338-23-4)

Biodegradation:
Readily biodegradable. (28 d) biodegradation 87 % / OECD guideline 301D (Closed bottle test)

Octanol Water Partition Coefficient:
log Pow: < 2.04, at 77 °F (25 °C) (Method: OECD Test Guideline 117)

Data for 2,4-Pentanediol, 2-methyl- (107-41-5)

Biodegradation:
Readily biodegradable. (28 d) biodegradation 81 % / OECD Test Guideline 301 F

Octanol Water Partition Coefficient:
log Pow: = -0.14(Method: calculated)

Data for 2-Butanone (78-93-3)

Biodegradation:
Readily biodegradable. (28 d) biodegradation 98 % / OECD Test Guideline 301 D

Octanol Water Partition Coefficient:
log Pow: = 0.3

Photodegradation:
Half-life direct photolysis: = 6.9 d
(is rapidly degraded in air by OH radicals.)

Ecotoxicology
Data on this material and/or its components are summarized below.

Data for Propanoic acid, 2-methyl-, 2,2-dimethyl-1-(1-methylethyl)-1,3-propanediyl ester (6846-50-0)

Aquatic toxicity data:
No effect up to the limit of solubility. Lepomis macrochirus (Bluegill sunfish) 96 h NOEC > 6 mg/l

Aquatic invertebrates:
No effect up to the limit of solubility. Daphnia magna (Water flea) 48 h EC50 > 1.46 mg/l

Algae:
No effect up to the limit of solubility. Pseudokirchneriella subcapitata (green algae) 72 h EC50 (growth rate) > 7.49 mg/l

Chronic toxicity to aquatic invertebrates:
Toxic. Daphnia magna (Water flea) 21 d NOEC (reproduction) = 0.7 mg/l

Chronic toxicity to aquatic plants:
Practically nontoxic. Pseudokirchneriella subcapitata (green algae) 72 h NOEC (growth rate) = 3.56 mg/l

Data for 2-Butanone, peroxide (1338-23-4)

Aquatic toxicity data:
Harmful. Poecilia reticulata (guppy) 96 h LC50 = 44.2 mg/l (In solution in Dimethyl phthalate)

Aquatic invertebrates:
Harmful. Daphnia (water flea) 48 h EC50 = 39 mg/l (In solution in Dimethyl phthalate)

Algae:
Toxic. Pseudokirchneriella subcapitata (green algae) 72 h ErC50 = 5.6 mg/l (In solution in Dimethyl phthalate)

Microorganisms:
Respiration inhibition / Activated sludge 30 min EC50 = 48 mg/l (In solution in Dimethyl phthalate)

Chronic toxicity to aquatic plants:
Pseudokirchneriella subcapitata (green algae) 72 h ErC10 2.1 mg/l

Data for 2,4-Pentanediol, 2-methyl- (107-41-5)

Aquatic toxicity data:
Practically nontoxic. Gambusia affinis (Mosquito fish) 96 h LC50 = 8,510 mg/l

Aquatic invertebrates:
Practically nontoxic. Daphnia magna (Water flea) 48 h EC50 = 5,410 mg/l

Algae:
Practically nontoxic. Selenastrum capricornutum 72 h EC50 > 429 mg/l

Microorganisms:
Practically nontoxic. Bacteria 10 d NOEC > 1,000 mg/l

Chronic toxicity to aquatic plants:
Practically nontoxic. Pseudokirchneriella subcapitata (green algae) 72 d NOEC = 429 mg/l

Data for 2-Butanone (78-93-3)

Aquatic toxicity data:
Practically nontoxic. Pimephales promelas (fathead minnow) 96 h LC50 = 3,200 mg/l

Aquatic invertebrates:
Practically nontoxic. Daphnia magna (Water flea) 48 h EC50 = 308 mg/l

Algae:
Practically nontoxic. Pseudokirchneriella subcapitata (green algae) 72 h EC50 = 1,972 mg/l

Microorganisms:
Pseudomonas putida 16 h Toxicity threshold = 1,150 mg/l

13. DISPOSAL CONSIDERATIONS

Waste disposal:
Dilution followed by incineration is the preferred method. Dilution ratio of 10:1 in a clean, compatible, combustible solvent (i.e., Fuel Oil #2, mineral oil) will reduce reactivity hazard during incineration and transportation. Dispose of in accordance with federal, state and local regulations. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits. Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

Take appropriate measures to prevent release to the environment.

14. TRANSPORT INFORMATION

US Department of Transportation (DOT)

UN Number	:	3105
Proper shipping name	:	Organic peroxide type D, liquid
Technical name	:	(Methyl ethyl ketone peroxide(s), <= 45%)
Class	:	5.2
Marine pollutant	:	yes
Reportable quantity	:	10 lbs (Methyl ethyl ketone peroxide(s))

International Maritime Dangerous Goods Code (IMDG)

UN Number	:	3105
Proper shipping name	:	ORGANIC PEROXIDE TYPE D, LIQUID
Technical name	:	(METHYL ETHYL KETONE PEROXIDE, <= 45%)
Class	:	5.2
Marine pollutant	:	yes
Flash point	:	203 °F (95 °C) Setaflash closed cup

15. REGULATORY INFORMATION

Chemical Inventory Status

United States TSCA Inventory	TSCA	The components of this product are all on the TSCA Inventory.
Canadian Domestic Substances List (DSL)	DSL	All components of this product are on the Canadian DSL
China. Inventory of Existing Chemical Substances in China (IECSC)	IECSC (CN)	Conforms to
Japan. ENCS - Existing and New Chemical Substances Inventory	ENCS (JP)	Does not conform
Japan. ISHL - Inventory of Chemical Substances	ISHL (JP)	Does not conform
Korea. Korean Existing Chemicals Inventory (KECI)	KECI (KR)	Conforms to
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	PICCS (PH)	Conforms to
Australia Inventory of Chemical Substances (AICS)	AICS	Conforms to

United States – Federal Regulations

SARA Title III – Section 302 Extremely Hazardous Chemicals:

Chemical name	CAS-No.	SARA Reportable Quantities	SARA Threshold Planning Quantity
Hydrogen peroxide	7722-84-1	1000 lbs	1000 lbs

SARA Title III - Section 311/312 Hazard Categories:
Acute Health Hazard, Chronic Health Hazard, Reactivity Hazard

SARA Title III – Section 313 Toxic Chemicals:
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) - Reportable Quantity (RQ):

Chemical name	CAS-No.	Reportable quantity
2-Butanone, peroxide	1338-23-4	10 lbs
2-Butanone	78-93-3	5000 lbs

United States – State Regulations

New Jersey Right to Know

Chemical name	CAS-No.
2-Butanone, peroxide	1338-23-4
2,4-Pentanediol, 2-methyl-	107-41-5
2-Butanone	78-93-3

New Jersey Right to Know – Special Health Hazard Substance(s)

Chemical name	CAS-No.
2-Butanone, peroxide	1338-23-4
2-Butanone	78-93-3

Pennsylvania Right to Know

Chemical name	CAS-No.
Propanoic acid, 2-methyl-, 2,2-dimethyl-1-(1-methylethyl)-1,3-propanediyl ester	6846-50-0
2-Butanone, peroxide	1338-23-4
2,4-Pentanediol, 2-methyl-	107-41-5
2-Butanone	78-93-3
Hydrogen peroxide	7722-84-1

Pennsylvania Right to Know – Environmentally Hazardous Substance(s)

Chemical name	CAS-No.
2-Butanone, peroxide	1338-23-4
2-Butanone	78-93-3
Hydrogen peroxide	7722-84-1

California Prop. 65
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Chemical name	CAS-No.
2-Pyrrolidinone, 1-methyl-	872-50-4

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H225	Highly flammable liquid and vapour.
H227	Combustible liquid.
H242	Heating may cause a fire.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H360	May damage fertility or the unborn child.
H361	Suspected of damaging fertility or the unborn child.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Latest Revision(s):

Reference number:	200013706
Date of Revision:	02/08/2019
Date Printed:	02/08/2019

LUPEROX® is a registered trademark of Arkema Inc.

The statements, technical information and recommendations contained herein are believed to be accurate as of the date hereof. Since the conditions and methods of use of the product and of the information referred to herein are beyond our control, ARKEMA expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information; **NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE GOODS DESCRIBED OR THE INFORMATION PROVIDED HEREIN.** The information provided herein relates only to the specific product designated and may not be applicable when such product is used in combination with other materials or in any process. The user should thoroughly test any application before commercialization. Nothing contained herein constitutes a license to practice under any patent and it should not be construed as an inducement to infringe any patent and the user is advised to take appropriate steps to be sure that any proposed use of the product will not result in patent infringement. See SDS for Health & Safety Considerations.

Arkema has implemented a Medical Policy regarding the use of Arkema products in Medical Devices applications that are in contact with the body or circulating bodily fluids (http://www.arkema.com/en/social-responsibility/responsible-product-management/medical-

device-policy/index.html) Arkema has designated Medical grades to be used for such Medical Device applications. Products that have not been designated as Medical grades are not authorized by Arkema for use in Medical Device applications that are in contact with the body or circulating bodily fluids. In addition, Arkema strictly prohibits the use of any Arkema products in Medical Device applications that are implanted in the body or in contact with bodily fluids or tissues for greater than 30 days. The Arkema trademarks and the Arkema name shall not be used in conjunction with customers' medical devices, including without limitation, permanent or temporary implantable devices , and customers shall not represent to anyone else, that Arkema allows, endorses or permits the use of Arkema products in such medical devices.
It is the sole responsibility of the manufacturer of the medical device to determine the suitability (including biocompatibility) of all raw materials, products and components, including any medical grade Arkema products, in order to ensure that the final end-use product is safe for its end use; performs or functions as intended; and complies with all applicable legal and regulatory requirements (FDA or other national drug agencies) It is the sole responsibility of the manufacturer of the medical device to conduct all necessary tests and inspections and to evaluate the medical device under actual end-use requirements and to adequately advise and warn purchasers, users, and/or learned intermediaries (such as physicians) of pertinent risks and fulfill any postmarket surveillance obligations. Any decision regarding the appropriateness of a particular Arkema material in a particular medical device should be based on the judgment of the manufacturer, seller, the competent authority, and the treating physician.