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
Synonyms: Not available
Molecular formula: Complex mixture
Chemical family: Organic peroxide - ketone peroxides
Product use: initiator/catalyst

2. HAZARDS IDENTIFICATION

Emergency Overview
Color: colourless
Physical state: liquid
Form: oily
Odor: sweet

***Classification of the substance or mixture:**
Organic peroxides, Type D, H242
Oral: Acute toxicity, Category 4, H302
Skin corrosion, Category 1B, H314
Serious eye damage, Category 1, H318
Chronic aquatic toxicity, Category 3, H412

*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.
H302 : Harmful if swallowed.
H314 : Causes severe skin burns and eye damage.
H412 : Harmful to aquatic life with long lasting effects.

Supplemental Hazard Statements:

Organic peroxide. Hazardous decomposition may occur.

Precautionary statements:

Prevention:
P210 : Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P220 : Keep/Store away from clothing/ combustible materials.
P234 : Keep only in original container.
P264 : Wash skin thoroughly after handling.
P270 : Do not eat, drink or smoke when using this product.
P273 : Avoid release to the environment.
P280 : Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P301 + P312 : IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.
P301 + P330 + P331 : IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 : IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ 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.
P310 : Immediately call a POISON CENTER or doctor/ physician.
P363 : Wash contaminated clothing before reuse.

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/ 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
2-Butanone, peroxide	1338-23-4	>= 32 - < 34 %	H302, H312, H314, H318, H242

2,4-Pentanediol, 2-methyl-	107-41-5	>= 5.5 - < 6.5 %	H319, H336
2-Butanone	78-93-3	>= 1 - < 2 %	H225, H315, H319, H336
1-Butanamine, N,N-dibutyl-	102-82-9	<= 1 %	H302, H310, H330, H315
Hydrogen peroxide	7722-84-1	<= 1 %	H271, H301, H332, H335, H314, H318, H412

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

4. FIRST AID MEASURES

Inhalation:
If inhaled, remove victim to fresh air. 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 unless directed to do so by medical personnel. Get medical attention immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person. Rinse mouth.

5. FIREFIGHTING MEASURES

Extinguishing media (suitable):
Water spray, 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 clean sand, earth, diatomaceous earth or non-acidic clay and place into suitable properly labeled containers for prompt disposal. 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.
Avoid breathing 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:
Store in closed containers, in a secure area to prevent container damage and subsequent spillage. Outside or detached storage is preferred. Store out of direct sunlight in a cool well-ventilated place. Store in original container. 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:
Strong acids

Strong bases

Strong oxidizing agents

Reducing agents

Accelerators

Friedel - Crafts reaction catalyst

transition metal salts

metal ions

Brass

Copper

Iron

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 below:–
50 °F (10 °C)

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

Ceiling Limit Value	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)

Hydrogen peroxide (7722-84-1)

US. ACGIH Threshold Limit Values

Time weighted average	1 ppm

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

PEL:	1 ppm (1.4 mg/m3)

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:
Avoid breathing 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.

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:	colourless
Physical state:	liquid
Form:	oily
Odor:	sweet
Odor threshold:	No data available
Flash point	The flashpoint of this product is greater than the Self Acceleration Decomposition Temperature (SADT).
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:	1.0077 g/cm3 (68 °F (20 °C))
Specific Gravity (Relative density):	1.0088 (68 °F(20 °C))Water=1 (liquid)
Vapor pressure:	5.20 mmHg (66 °F (19 °C))
Vapor density:	No data available
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
Refractive index:	1.4356
Viscosity, dynamic:	17.30 mPa.s 68 °F (20 °C)
Oil/water partition coefficient:	No data available
Self-Accelerating Decomposition Temperature (SADT):	167 °F (75 °C) 45 pound container
Thermal decomposition	No data available
Active oxygen content:	8.7 - 9.0 %
Flammability:	See GHS Classification in Section 2

10. STABILITY AND REACTIVITY

Stability:
This material is chemically unstable and should only be handled under specified conditions.

Hazardous reactions:
Hazardous polymerization does not occur.

Materials to avoid:
Strong acids
Strong bases
Strong oxidizing agents
Reducing agents
Accelerators
Friedel - Crafts reaction catalyst
transition metal salts
metal ions
Brass
Copper
Iron
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:
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. See HANDLING AND STORAGE section of this SDS for specified conditions. See Hazardous Decomposition Products below.

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

Acute toxicity

Oral:
Acute toxicity estimate 1,992 mg/kg.

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

Inhalation:
4 h Acute toxicity estimate 39.54 mg/l.

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

Acute toxicity

Skin Irritation:
Not irritating. (Rabbit) Irritation Index: 0/8. (4 h)

Eye Irritation:
Causes mild eye irritation. (Rabbit)

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

Repeated dose toxicity
Repeated oral administration to rat / affected organ(s): kidney, liver / signs: clinical chemistry changes, changes in organ weights, 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) / No birth defects were observed.

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

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 dermal administration to rat and mouse / affected organ(s): skin / signs: severe damage / No adverse systemic effects reported.

Genotoxicity

Assessment in Vitro:
Both positive and negative responses for 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

Reproductive/Developmental Effects Screening Assay. 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

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

Skin Irritation:
Practically non-irritating. (Rabbit) Irritation Index: 0.4/8. (4 h)

Eye Irritation:
Causes serious eye irritation. (Rabbit)

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

Repeated dose toxicity
Repeated dietary 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

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

Skin Irritation:
Causes 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 / signs: 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

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)

Aspiration hazard
May be fatal if swallowed and enters airways.

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 1-Butanamine, N,N-dibutyl- (102-82-9)

Acute toxicity

Skin Irritation:
Causes skin irritation. (Rabbit) (1 h)

Eye Irritation:
Causes mild eye irritation. (Rabbit) Irritation Index: 2 / 110.

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

Repeated dose toxicity
Repeated inhalation administration to Rat / signs: nasal irritation, incoordination, restlessness, tremors

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 a laboratory test using: mice

Developmental toxicity

Exposure during pregnancy. oral (Rat) / No birth defects were observed. (at doses that produce effects in mothers)

Data for Hydrogen peroxide (7722-84-1)

Acute toxicity

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

Skin Irritation:
Causes severe skin burns. (Rabbit) (3 min) (70 %) (aqueous solution)

Eye Irritation:
Causes serious eye damage. (Rabbit) (70 %) (aqueous solution)

Repeated dose toxicity
Repeated drinking water administration to rat and mouse / affected organ(s): Gastro-intestinal tract / signs: irritation

Repeated inhalation administration to Rat / affected organ(s): nose / signs: irritation

Carcinogenicity
Chronic drinking water administration to rat and mouse / affected organ(s): Gastro-intestinal tract / signs: Increased incidence of tumors was reported.
Classified by the International Agency for Research on Cancer as: Group 3: Unclassifiable as to carcinogenicity in humans.

Genotoxicity

Assessment in Vitro:
Genetic changes were observed in laboratory tests using: bacteria, animal cells

Genotoxicity

Assessment in Vivo:
Genetic changes were observed in a laboratory test using: mice, rats

Human experience
Inhalation:
Throat: irritation. (based on reports of occupational exposure to workers)

Human experience
Skin contact:
Skin: bleaching of hair. (based on reports of occupational exposure to workers)

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

Human experience
Ingestion:
Gastrointestinal tract: bloating, ulceration, burns. (accidental exposure to concentrated solutions)

Lung: accumulation of fluid in the lungs, death. (severity of effects depends on extent of exposure)

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

Theoretical Biological Oxygen Demand:
Theoretical oxygen demand (ThOD) = 2,400 mg/g

Bioaccumulation:
BCF = 670 (without metabolism)

BCF = 14,611 (with metabolism)

BCF = 5.2 - 31 (Carp)

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

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

Biodegradation:
Readily biodegradable. (28 d) biodegradation 87 %

Octanol Water Partition Coefficient:
log Pow < 0.3

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

Biodegradation:
Readily biodegradable. (28 d) biodegradation 81 %

Octanol Water Partition Coefficient:
log Pow = -0.14

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

Biodegradation:
Readily biodegradable. (28 d) biodegradation 98 %

Octanol Water Partition Coefficient:
log Pow = 0.3

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

Data for 1-Butanamine, N,N-dibutyl- (102-82-9)

Biodegradation:
Readily biodegradable (29 d) biodegradation 80.3 %

Biological Oxygen Demand:
15 d BOD >70%ThOD

Theoretical Biological Oxygen Demand:
Theoretical oxygen demand (ThOD) = 3,110 mg/g

Octanol Water Partition Coefficient:
log Pow = 3.338

Data for Hydrogen peroxide (7722-84-1)

Biodegradation:
Readily biodegradable. (0.02 d) biodegradation 99 %

Octanol Water Partition Coefficient:
log Pow = -1.57 (calculated)

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. Selenastrum capricornutum 72 h EC50 (growth rate) > 7.49 mg/l

Chronic toxicity to aquatic invertebrates:
Harmful. Daphnia magna (Water flea) 21 d NOEC (reproduction) = 0.7 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)

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

Aquatic toxicity data:
Practically nontoxic. Oncorhynchus mykiss (rainbow trout) 96 h LC50 = 9,450 mg/l
Practically nontoxic. Lepomis macrochirus (Bluegill sunfish) 96 h LC50 = 12,800 mg/l
Practically nontoxic. Pimephales promelas (fathead minnow) 96 h LC50 = 8,690 - 10,700 mg/l

Aquatic invertebrates:
Practically nontoxic. Daphnia magna (Water flea) 48 h EC50 = 3,200 - 5,410 mg/l

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

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

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

Aquatic toxicity data:
Practically nontoxic. Pimephales promelas (fathead minnow) 96 h LC50 = 2,993 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

Data for 1-Butanamine, N,N-dibutyl- (102-82-9)

Aquatic toxicity data:
Harmful. Oryzias latipes (medaka) 96 h LC50 = 16.3 mg/l

Aquatic invertebrates:
Toxic. Daphnia magna (Water flea) 48 h EC50 = 8 mg/l

Algae:
Toxic. Scenedesmus subspicatus 72 h EbC50 = 8.2 mg/l (neutralized product)
Toxic. Scenedesmus subspicatus 72 h EbC50 = 3.5 mg/l (product not neutralized)

Microorganisms:
Nitrosomonas sp 2 h NOEC = 100 mg/l

Data for Hydrogen peroxide (7722-84-1)

Aquatic toxicity data:
Harmful. Pimephales promelas (fathead minnow) 96 h LC50 = 16.4 mg/l

Aquatic invertebrates:
Toxic. Daphnia pulex (Water flea) 48 h EC50 = 2.4 mg/l

Algae:
Toxic. Skeletonema costatum (marine diatom) 72 h ErC50 = 1.38 mg/l

Microorganisms:
Activated sludge 0.5 h EC50 = 466 mg/l
Activated sludge 3 h EC50 > 1,000 mg/l

Chronic toxicity to aquatic invertebrates:
Harmful. Daphnia magna (Water flea) 21 d NOEC (reproduction) = 0.63 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
Packaging group	:	II
Marine pollutant	:	no
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	:	(METHY ETHYL KETONE PEROXIDE, <=45%)
Class	:	5.2
Marine pollutant	:	no

15. REGULATORY INFORMATION

Chemical Inventory Status

EU. EINECS	EINECS	Conforms to

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)	Conforms to
Japan. ISHL - Inventory of Chemical Substances	ISHL (JP)	Conforms to
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, 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
1-Butanamine, N,N-dibutyl-	102-82-9
Hydrogen peroxide	7722-84-1

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
1-Butanamine, N,N-dibutyl-	102-82-9
Hydrogen peroxide	7722-84-1

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
1-Butanamine, N,N-dibutyl-	102-82-9
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
This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive defects.

16. OTHER INFORMATION

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

H225	Highly flammable liquid and vapour.
H242	Heating may cause a fire.
H271	May cause fire or explosion; strong oxidizer.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H310	Fatal in contact with skin.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H412	Harmful to aquatic life with long lasting effects.

HMIS ratings:

Health:	3 (SERIOUS HAZARD)
Fire:	2 (MODERATE HAZARD)
Reactivity:	3 (SERIOUS HAZARD)

Latest Revision(s):

Reference number:	000000034127
Date of Revision:	10/18/2015
Date Printed:	11/29/2016

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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.