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, 8:30 AM to 5:30 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® 230XL40
Synonyms: Peroxyketal
Molecular formula: Complex Mixture
Chemical family: Organic peroxide
Product use: cross-linking agent

2. HAZARDS IDENTIFICATION

Emergency Overview

Color: white
Physical state: solid
Form: powder
Odor: slight chlorine

WARNING!
ORGANIC PEROXIDE.
HAZARDOUS DECOMPOSITION MAY OCCUR.
MAY FORM COMBUSTIBLE DUST-AIR MIXTURES.
HARMFUL IF ABSORBED THROUGH SKIN.
MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.

Potential Health Effects

Primary routes of exposure:
Inhalation and skin contact.

Signs and symptoms of acute exposure:
Product dust may be irritating to eyes, skin and respiratory system. Prolonged or repeated contact may dry skin and cause irritation. May also cause: dermatitis, bronchitis. (severity of effects depends on extent of exposure) .

Skin:
No more than moderately toxic. Moderately irritating. (based on components)

Inhalation:
Possible irritation of respiratory system (by dust inhalation). (based on data for a component) (based on human experience)

Eyes:
Moderately irritating. (based on components)

Ingestion:
Practically nontoxic. (based on components)

Remarks:
Mechanical irritation effects from dust exposure are possible at ambient temperature.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	Wt/Wt	OSHA Hazardous
Carbonic acid calcium salt (1:1)	471-34-1	<= 48 %	Y
Pentanoic acid, 4,4-bis[(1,1-dimethylethyl)dioxy]-, butyl ester	995-33-5	>= 38.5 - <= 41.5 %	Y
Silicic acid, calcium salt	1344-95-2	<= 13 %	Y

The substance(s) marked with a "Y" in the Hazard column above, are those identified as hazardous chemicals under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

This material is classified as hazardous under Federal OSHA regulation.

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.

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. Call a Poison Control Center. 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. Call a Poison Control Center.

Ingestion:
If swallowed, DO NOT induce vomiting. Get medical attention. Never give anything by mouth to an unconscious person.

5. FIREFIGHTING MEASURES

Flash point not applicable

Auto-ignition temperature: no data available

Lower flammable limit (LFL): no data available

Upper flammable limit (UFL): no data available

Extinguishing media (suitable):
water spray, foam, Dry chemical, Carbon dioxide (CO2)

Extinguishing media (unsuitable):
Halons

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).
Fire fighting equipment should be thoroughly decontaminated after use.

Further firefighting advice:
Do not use a solid stream of water.
A solid stream of water can cause a dust explosion.
Fight fire with large amounts of water from a safe distance.
Closed containers of this material may explode when subjected to heat from surrounding fire.
Cool closed containers exposed to fire with water spray.
After a fire, wait until the material has cooled to room temperature before initiating clean-up activities.

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

In case of spill or leak:
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 dust formation and dispersal of dust in the air. Wet down (dampen) the spilled material with water. 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. Implement workplace practices such that dusts are not allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. 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.

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.
Keep away from heat, sparks and flames.
Avoid breathing dust.
Avoid contact with the skin, eyes and clothing.
Wash thoroughly after handling.
Keep container tightly closed.
Use only with adequate ventilation.
Prevent product contamination.
Avoid creating dust in handling, transfer or clean up.
Prevent dust accumulation.
Implement routine housekeeping practices to ensure that dusts do not accumulate on surfaces.
Check that all equipment is properly grounded and installed to satisfy electrical classification requirements.
Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations.
Container hazardous when empty.
Emptied container retains product residue.
Follow label warnings even after container is emptied.
RESIDUAL DUSTS MAY EXPLODE ON IGNITION.
DO NOT CUT, DRILL, GRIND, OR WELD ON OR NEAR THIS CONTAINER.
Improper disposal or reuse of this container may be dangerous and/or illegal.

Storage

General information on storage conditions:
Outside or detached storage is preferred.Store out of direct sunlight in a cool well-ventilated place.Store in well ventilated area away from heat and sources of ignition such as flame, sparks and static electricity.Ensure that all storage and handling equipment is properly grounded and installed to satisfy electrical classification requirements.Static electricity may accumulate when transferring material.All metal and groundable storage containers, including but not limited to drums, cylinders, Returnable Intermodal Bulk Containers (RIBCs) and Class C Flexible Intermodal Bulk Containers (FIBCs) must be bonded and grounded during filling and emptying operations.Observe all federal, state and local regulations and National Fire Protection Association (NFPA) Codes, which pertain to the specific local conditions of storage and use, including NFPA 654.
Refer also to National Fire Protection Association (NFPA) Code 400, Hazardous Materials Code.

Storage incompatibility – General:
Store separate from:

Strong acids

Strong bases

Strong oxidizing agents

Reducing agents

Accelerators

Friedel - Crafts reaction catalyst

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 above:
100 °F (38 °C)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne Exposure Guidelines:

Carbonic acid calcium salt (1:1) (471-34-1)

US. ACGIH Threshold Limit Values

time weighted average	10 mg/m3
Remarks:	The value is for particulate matter containing no asbestos and <1% crystalline silica.

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

Form:	Respirable fraction.
PEL:	5 mg/m3
Form:	Total dust.
PEL:	15 mg/m3

Silicic acid, calcium salt (1344-95-2)

US. ACGIH Threshold Limit Values

Time Weighted Average (TWA):	10 mg/m3
Remarks:	The value is for particulate matter containing no asbestos and <1% crystalline silica.

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

Form:	Respirable fraction.
PEL:	5 mg/m3
Form:	Total dust.
PEL:	15 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.

Check that all dust control equipment such as local exhaust ventilation, material transport systems, and air-material separation devices involved in handling this product contain explosion relief vents or an explosion suppression system or an oxygen-deficient environment.Isolation devices may be appropriate to prevent propagation from one unit to another.Ensure that dust-handling systems are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).Consult ACGIH ventilation manual, NFPA Standard 91 and NFPA Standard 654 for design of exhaust system and safe handling.

Respiratory protection:
Avoid breathing dust. 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 recommended). 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. Rinse immediately if skin is contaminated. Wash contaminated clothing and clean protective equipment before reuse. Wash thoroughly after handling.

Eye protection:
Where eye contact may be likely, wear chemical goggles and have eye flushing equipment available.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color:	white
Physical state:	solid
Form:	powder
Odor:	slight chlorine
pH:	not applicable
Density:	no data available
Vapor pressure:	no data available

Vapor density:	not applicable
Melting point/range:	Decomposes before melting.
Solubility in water:	insoluble
Self-Accelerating Decomposition Temperature (SADT):	140 °F (60 °C) 20 pound container
Active oxygen content:	3.68 - 3.97 %

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
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 MSDS 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 Carbonic acid calcium salt (1:1) (471-34-1)

Acute toxicity

Oral:
Practically nontoxic. (rat) LD50 = 6,450 mg/kg.

Dermal:
No more than moderately toxic. (rabbit) LDL0 = 500 mg/kg.

Inhalation:
No deaths occurred. (rat) 1.5 h LC0 >= 0.08 mg/l.

Skin Irritation:
Slightly to moderately irritating. (rabbit)

Eye Irritation:
Slightly to moderately irritating. (rabbit)

Skin Sensitization:
Repeated skin exposure. (guinea pig) No skin allergy was observed

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

Genotoxicity

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

Developmental toxicity
Exposure during pregnancy. dietary (sheep) / bone effects in lambs (at doses that produce effects in mothers, blood chemistry changes)
Exposure during pregnancy. dietary (rat) / No birth defects were observed.

Human experience
General:
Dust contact with the eyes can lead to mechanical irritation. Contact with dust can cause mechanical irritation or drying of the skin.

Human experience
Inhalation:
Upper respiratory tract: Local irritation, coughing. (dust) (severity of effects depends on extent of exposure)

Human experience
Ingestion:
Kidney: failure, weakness, nausea. (effects of excessive exposure)

Data for Pentanoic acid, 4,4-bis[(1,1-dimethylethyl)dioxy]-, butyl ester (995-33-5)

Acute toxicity

Oral:
Practically nontoxic. (rat) LD50 > 5,000 mg/kg. (40 %) (applied in low hazard matrix)

Dermal:
Practically nontoxic. (rat) LD0 >= 1,000 - 2,000 mg/kg. (50 %)

Skin Irritation:
Slightly irritating. (rabbit)

Eye Irritation:
Slightly irritating. (rabbit)

Skin Sensitization:
Repeated skin exposure. (guinea pig) No skin allergy was observed

Genotoxicity

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

Data for Silicic acid, calcium salt (1344-95-2)

Acute toxicity

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

Repeated dose toxicity
Chronic dietary administration to rat and dog / affected organ(s): kidney, urinary bladder / signs: urinary calculi (stones) / No significant impairment of function.

Chronic inhalation administration to rat / No adverse systemic effects reported.

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

Genotoxicity

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

Both positive and negative responses for genetic changes were observed in laboratory tests using: human cells

Genotoxicity

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

Developmental toxicity
Exposure during pregnancy. oral (rat, mouse, hamster) / No birth defects were observed.

Human experience
General:
Contact with dust can cause mechanical irritation or drying of the skin. Dust contact with the eyes can lead to mechanical irritation.

Human experience
Inhalation:
Upper respiratory tract: Local irritation, bronchitis. (based on reports of occupational exposure to workers)

Human experience
Skin contact:
Skin: dry skin, dermatitis. (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 Pentanoic acid, 4,4-bis[(1,1-dimethylethyl)dioxy]-, butyl ester (995-33-5)

Biodegradation:
Not readily biodegradable. (28 d) biodegradation 52 %

Behavior in Water Treatment Plant:
Respiration inhibition of activated sludge 3 h EC50 > 20 mg/l

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

Data for Carbonic acid calcium salt (1:1) (471-34-1)

Aquatic toxicity data:
Practically nontoxic. Gambusia affinis (Mosquito fish) 96 h LC50 > 1,000 mg/l

Data for Pentanoic acid, 4,4-bis[(1,1-dimethylethyl)dioxy]-, butyl ester (995-33-5)

Aquatic invertebrates:
No effect up to the limit of solubility. Daphnia magna (Water flea) 48 h EC50 > 0.194 mg/l (Limit of water solubility.)

Algae:
Highly toxic. Pseudokirchneriella subcapitata (green algae) 72 h EC50 = 0.657 mg/l

Microorganisms:
Slightly toxic. Respiration inhibition / Activated sludge 3 h EC50 > 20 mg/l

13. DISPOSAL CONSIDERATIONS

Waste disposal:
Disposal via incineration is recommended. 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.

14. TRANSPORT INFORMATION

US Department of Transportation (DOT)

UN Number	:	3108
Proper shipping name	:	Organic peroxide type E, solid
Technical name	:	(n-Butyl-4,4-di-(tert-butylperoxy) valerate, <=52%)
Class	:	5.2
Packaging group	:	II
Marine pollutant	:	no

International Maritime Dangerous Goods Code (IMDG)

UN Number	:	3108
Proper shipping name	:	ORGANIC PEROXIDE TYPE E, SOLID
Technical name	:	(n-BUTYL-4,4-DI-(tert-BUTYLPEROXY)VALERATE, <=52%)
Class	:	5.2
Marine pollutant	:	no

15. REGULATORY INFORMATION

Chemical Inventory Status

EU. EINECS	EINECS	Conforms to
US. Toxic Substances Control Act	TSCA	The components of this product are all on the TSCA Inventory.
Australia. Industrial Chemical (Notification and Assessment) Act	AICS	Conforms to
Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL)	DSL	All components of this product are on the Canadian DSL list.
Japan. Kashin-Hou Law List	ENCS (JP)	Conforms to
Korea. Existing Chemicals Inventory (KECI)	KECI (KR)	Conforms to
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	PICCS (PH)	Conforms to
China. Inventory of Existing Chemical Substances	IECSC (CN)	Conforms to

United States – Federal Regulations

SARA Title III – Section 302 Extremely Hazardous Chemicals:

The components in this product are either not SARA Section 302 regulated or regulated but present in negligible concentrations.

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

SARA Title III – Section 313 Toxic Chemicals:
SARA 313: 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):

The components in this product are either not CERCLA regulated, regulated but present in negligible concentrations, or regulated with no assigned reportable quantity.

OSHA Regulated Carcinogens (NTP, IARC, OSHA Listed):

NTP:
No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

IARC:
No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA:
No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

United States – State Regulations

New Jersey Right to Know

Chemical Name	CAS-No.
Hydroperoxide, 1,1-dimethylethyl	75-91-2
Pentanoic acid, 4,4-bis[(1,1-dimethylethyl)dioxy]-, butyl ester	995-33-5

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

Chemical Name	CAS-No.
Hydroperoxide, 1,1-dimethylethyl	75-91-2

Pennsylvania Right to Know

Chemical Name	CAS-No.
Carbonic acid calcium salt (1:1)	471-34-1
Silicic acid, calcium salt	1344-95-2
Pentanoic acid, 4,4-bis[(1,1-dimethylethyl)dioxy]-, butyl ester	995-33-5

California Prop. 65
WARNING! This product contains a chemical known to the State of California to cause cancer.

Chemical Name	CAS-No.
Quartz (SiO2)	14808-60-7

16. OTHER INFORMATION

Miscellaneous:

Other information:	Refer to National Fire Protection Association (NFPA) Code 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids, for safe handling.

Latest Revision(s):

Reference number:	000000034060
Date of Revision:	03/29/2013
Date Printed:	03/29/2013

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