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: ECHO® A
Synonyms: Mercapto-thiodiazole derivative
Molecular formula: C9 H6 N2 OS3
Chemical family: Thioester
Product use: Initiator

2. HAZARDS IDENTIFICATION

Emergency Overview

Color: off-white, to, yellow
Physical state: solid
Form: powder
Odor: mild, pungent

DANGER!
MAY FORM COMBUSTIBLE DUST-AIR MIXTURES.
CAUSES EYE BURNS.
MAY CAUSE BLINDNESS.
MAY CAUSE ALLERGIC SKIN REACTION.
MAY CAUSE SKIN AND RESPIRATORY TRACT IRRITATION.
RELEASES IRRITATING AND HIGHLY TOXIC VAPORS ON DECOMPOSITION.

Potential Health Effects

Primary routes of exposure:
Inhalation and skin contact.

Signs and symptoms of acute exposure:
Corrosive to the eyes. Causes burns. May cause irritation of respiratory tract. May cause skin irritation. Prolonged or repeated exposure may cause: Allergic skin reaction: redness, rash. Decomposition gives toxic and corrosive products. Effects due to processing releases: Irritating to eyes, respiratory system and skin.

Skin:
Moderately irritating. May cause allergic skin reaction. (based on components)

Eyes:
Corrosive. (based on components)

Ingestion:
Practically nontoxic. (based on components)

Remarks:
This product may release fume and/or vapor of variable composition depending on processing time and temperature. Decomposition during processing may liberate toxic and/or corrosive vapor.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	Wt/Wt	OSHA Hazardous
Thiadiazole derivative	Proprietary*	>= 88 - < 96 %	Y
Benzoic acid	65-85-0	>= 0.1 - <= 3 %	Y
1,3,4-Thiadiazolidine-2,5-dithione, sodium salt (1:1)	50530-45-5	>= 0.1 - <= 2 %	N
Benzenecarbothioic acid, S,S'-1,3,4-thiadiazole-2,5-diyl ester	62132-94-9	>= 0.1 - <= 10 %	N

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).

*The specific chemical identity is withheld because it is trade secret information of Arkema Inc.

This material is classified as hazardous under Federal OSHA regulation.

4. FIRST AID MEASURES

Inhalation:
If inhaled, remove victim to fresh air.

Skin:
In case of contact, immediately flush skin with soap and plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. 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. Never give anything by mouth to an unconscious person.

5. FIRE-FIGHTING MEASURES

Flash point	Not applicable
Auto-ignition temperature:	Not determined
Lower flammable limit (LFL):	Not determined
Upper flammable limit (UFL):	Not determined

Extinguishing media (suitable):
Carbon dioxide (CO2), water fog, 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).
Fire fighting equipment should be thoroughly decontaminated after use.

Further firefighting advice:
Fight fire with large amounts of water from a safe distance.
Do not use a solid stream of water.
A solid stream of water can cause a dust explosion.
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:
Decomposes on heating.
Dust clouds generated during handling and/or storage can form explosive mixtures with air. Dust explosion characteristics vary with the particle size, particle shape, moisture content, contaminants, and other variables.
Note: Check that all equipment is properly grounded and installed to satisfy electrical classification requirements. As with any dry material, pouring this material or allowing it to free-fall or to be conveyed through chutes or pipes can accumulate and generate electrostatic sparks, potentially causing ignition of the material itself, or of any flammable materials which may come into contact with the material or its container.

When burned, the following hazardous products of combustion can occur:
Hydrogen sulphide
Carbon oxides
Nitrogen oxides
Sulphur oxides
Carbon disulfides
Hydrazine

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:
Keep away from heat, sparks and flames.
Do not get in eyes, on skin, or on clothing.
Avoid breathing processing fumes or vapors.
Avoid breathing dust.
Prevent dust accumulation.
Avoid creating dust in handling, transfer or clean up.
Keep container closed.
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.
Use only with adequate ventilation.
Wash thoroughly after handling.
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.
Do not reuse container as it may retain hazardous product residue.

Storage

General information on storage conditions:
Outside or detached storage is preferred.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.Store out of direct sunlight in a cool well-ventilated place.Store away from combustibles and materials to avoid.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.

Storage stability – Temperature:–
estimated < 104 °F (< 40 °C)

Storage stability – Remarks:
Stable under recommended storage conditions.

Storage incompatibility – General:
Store separate from:

Oxidizing agents

Strong acids

Strong bases

Temperature tolerance – Do not store above:
140 °F (60 °C)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne Exposure Guidelines:

Particles Not Otherwise Specified / Nuisance Dust

US. ACGIH Threshold Limit Values

Form:	Inhalable particles.
Time Weighted Average (TWA):	10 mg/m3
Form:	Respirable particles.
Time Weighted Average (TWA):	3 mg/m3

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

Form:	Respirable fraction.
PEL:	5 mg/m3
Remarks:	All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by the Particulates Not Otherwise Regulated (PNOR) limit which is the same as the inert or nuisance dust limit of Table Z-3.
Form:	Total dust.
PEL:	15 mg/m3
Remarks:	All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by the Particulates Not Otherwise Regulated (PNOR) limit which is the same as the inert or nuisance dust limit of Table Z-3.

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 processing fumes or vapors. 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 and substances released during processing. 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. Rinse immediately if skin is contaminated. Wash contaminated clothing and clean protective equipment before reuse. 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:	off-white, to, yellow
Physical state:	solid
Form:	powder
Odor:	mild, pungent
pH:	not applicable
Density:	1.460 g/cm3

Specific Gravity (Relative density):	1.46
Vapor pressure:	not determined
Vapor density:	not determined
Boiling point/boiling range:	not determined
Melting point/range:	Decomposes before melting.
Evaporation rate:	not determined (n-butyl acetate = 1)
Solubility in water:	hydrolyses
% Volatiles:	68 °F (20 °C) negligible
Minimum ignition energy:	25 - 50 mJ

10. STABILITY AND REACTIVITY

Stability:
The product is stable under normal handling and storage conditions.

Hazardous reactions:
Hazardous polymerization does not occur.

Materials to avoid:
Oxidizing agents
Strong acids
Strong bases

Conditions / hazards to avoid:
See HANDLING AND STORAGE section of this MSDS for specified conditions.

Hazardous decomposition products:

Thermal decomposition giving toxic and corrosive products :
Hydrogen sulphide
Carbon oxides
Nitrogen oxides
Sulphur oxides
Carbon disulfides
Hydrazine

11. TOXICOLOGICAL INFORMATION

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

Data for Thiadiazole derivative (Proprietary)

Acute toxicity

Oral:
Practically nontoxic. (rat) LD50 = 11,300 mg/kg.

Inhalation:
Signs/effects reported after acute exposure. (rat) signs: severe irritation, death, in minutes
(Decomposition products, Inhalation of vapours from heated product)

Skin Irritation:
Moderately irritating.

Eye Irritation:
Corrosive. (rabbit)

Skin Sensitization:
(guinea pig) Skin allergy was observed.

Other information
Heating can cause decomposition and liberate toxic gas.
Thermal decomposition can lead to release of irritating gases and vapours.

Data for Benzoic acid (65-85-0)

Acute toxicity

Oral:
Slightly toxic. (rat) LD50 = 1,700 - 4,070 mg/kg.

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

Inhalation:
No deaths occurred. (rat) 4 h LC0 12.2 mg/l. (dust)

Skin Irritation:
Moderately irritating. (rabbit)

Eye Irritation:
Severely irritating. (rabbit)

Repeated dose toxicity
Repeated oral administration to rat and cat / affected organ(s): kidney, liver

Repeated oral administration to guinea pig, mouse, dog / No adverse systemic effects reported.

Genotoxicity

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

Reproductive effects
Multiple generation reproduction test. oral (rat) / No toxicity to reproduction.

Human experience
Skin contact:
Skin: contact dermatitis. Widespread topical use indicates this material is likely an irritant but not a sensitizer.

Skin: Skin allergy was observed. Sensitization described in isolated cases.

Data for Benzenecarbothioic acid, S,S'-1,3,4-thiadiazole-2,5-diyl ester (62132-94-9)

Acute toxicity

Oral:
No more than slightly toxic. (rat) LD50 > 2,000 mg/kg.

Genotoxicity

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

12. ECOLOGICAL INFORMATION

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

Data for Benzoic acid (65-85-0)

Biodegradation:
Readily biodegradable. (2 d) biodegradation 90 %

Bioaccumulation:
BCF < 10 (Fish)

BCF < 10 (Algae)

Octanol Water Partition Coefficient:
log Pow 1.87

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

Data for Thiadiazole derivative (Proprietary)

Aquatic toxicity data:
Moderately toxic. Pimephales promelas (fathead minnow) 96 h LC50 between 1 - 10 mg/l

Data for Benzoic acid (65-85-0)

Aquatic toxicity data:
Practically nontoxic. Leuciscus idus (Golden orfe) 48 h LC50 = 460 mg/l (tested at neutral pH)

Aquatic invertebrates:
Practically nontoxic. Daphnia magna (Water flea) 24 h EC50 = 500 mg/l

Algae:

Slightly toxic. Cell multiplication inhibition test / Scenedesmus quadricauda (Green algae) 3 h EC50 = 75 mg/l

Microorganisms:
Respiration inhibition / Activated sludge 3 h EC50 > 1,000 mg/l
Microtox test / Photobacterium phosphoreum 30 min EC50 = 16.85 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): not regulated

International Maritime Dangerous Goods Code (IMDG): not regulated

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). (Can. Gaz. Part II, Vol. 144)	DSL	All components of this product are on the Canadian DSL list.
Japan. Kashin-Hou Law List	ENCS (JP)	Does not conform
Korea. Existing Chemicals Inventory (KECI)	KECI (KR)	Conforms to
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	PICCS (PH)	Does not conform
China. Inventory of Existing Chemical Substances	IECSC (CN)	Conforms to
New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand	NZIOC	Does not conform

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, 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):

Chemical Name	CAS-No.	Reportable quantity
Benzoic acid	65-85-0	5000 lbs

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.
Benzoic acid	65-85-0

Pennsylvania Right to Know

Chemical Name	CAS-No.
Benzoic acid	65-85-0
Thiadiazole derivative	Proprietary

Pennsylvania Right to Know – Environmentally Hazardous Substance(s)

Chemical Name	CAS-No.

Benzoic acid	65-85-0

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

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):

Revised Section(s):	Updated Corporate Address Change and Rocky Mountain Poison Center Phone Number
Reference number:	000000060502
Date of Revision:	07/11/2011
Date Printed:	07/11/2011

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