LMK Catalyst for Polyester and Vinyl Ester Resin

SAFETY DATA SHEET

LMK TECHNOLOGIES

MAINLINES | LATERALS | MANHOLES | GASKET SEALS | EQUIPMENT

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SAFETY DATA SHEET

Catalyst

Version 1 Revision Date 04/26/2015 Print Date 06/18/2015 US / Z8

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	Catalyst
Product Use Description	:	Curing agent
Company	:	LMK Technologies 1779 Chessie Lane Ottawa, IL 61350 USA
Telephone	:	815.433.1275
Fax	:	815.433.0107
E-mail address	:	info@lmktechnologies.com
Emergency telephone	:	CHEMTREC - USA: 1-800-424-9300 CANUTEC - CANADA: 1-613-996-6666

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	paste
Color	white
Odor	faint

GHS Classification

Organic peroxides, Type E
Eye irritation, Category 2B
Skin sensitization, Category 1
Acute aquatic toxicity, Category 1
Chronic aquatic toxicity, Category 3

GHS Label element

Hazard pictograms :

Signal Word : Warning

Hazard Statements : H242 Heating may cause a fire.
H317 May cause an allergic skin reaction.
H320 Causes eye irritation.
H400 Very toxic to aquatic life.
H412 Harmful to aquatic life with long lasting effects.

Precautionary Statements	:	**Prevention:** P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking. P220 Keep away from dirt, rust, chemicals in particular. P234 Keep only in original container. P261 Avoid breathing dust or fume. P272 Contaminated work clothing must not be allowed out of the workplace. P273 Avoid release to the environment. P280 Wear protective gloves/ eye protection/ face protection. **Response:** P302 + P352 IF ON SKIN: Wash with plenty of soap and water. P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention. P337 + P313 If eye irritation persists: Get medical advice/ attention. P363 Wash contaminated clothing before reuse. P370 + P378 In case of fire: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide to extinguish. P391 Collect spillage. **Storage:** P403 Store in a well-ventilated place. P410 Protect from sunlight. P420 Store away from other materials. **Disposal:** P501 Dispose of contents/container in accordance with local regulation.

Potential Health Effects

Inhalation	:	Thermal decomposition can lead to release of irritating gases and vapors.
Skin	:	May cause an allergic skin reaction. May cause skin irritation.
Eyes	:	Causes serious eye irritation.
Ingestion	:	May cause irritation of the mucous membranes.
Aggravated Medical Condition	:	None known.
Symptoms of Overexposure	:	The symptoms and effects are as expected from the hazards as shown in section 2. No specific product related symptoms are known.

Carcinogenicity:

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

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous ingredients

Chemical Name	CAS-No.	Classification	Concentration [%]
Dibenzoyl peroxide	94-36-0	Org. Perox. B; H241 Eye Irrit. 2B; H320 Skin Sens. 1; H317 Aquatic Acute 1; H400 M-Factor (Acute): 10	50 - 70
zinc distearate	557-05-1	Aquatic Acute 1; H400	1 - 5

Dibenzoyl peroxide, paste, 50% in Dipropylene glycol dibenzoate

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

4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Consult a physician.
Show this material safety data sheet to the doctor in attendance.

Inhalation : Consult a physician after significant exposure.

Skin contact : Take off contaminated clothing and shoes immediately.
Rinse immediately with plenty of water.
If skin irritation persists, call a physician.

Eye contact : Rinse with plenty of water.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
Obtain medical attention.

Ingestion : Clean mouth with water and drink afterwards plenty of water.
Never give anything by mouth to an unconscious person.
Obtain medical attention.

Notes to physician

Symptoms : The symptoms and effects are as expected from the hazards as shown in section 2. No specific product related symptoms are known.

Treatment : Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Specific hazards during fire : CAUTION: reignition may occur.

fighting / Specific hazards arising from the chemical		Supports combustion. Water spray may be ineffective unless used by experienced firefighters. Heating may cause decomposition with release of toxic fumes. Do not allow run-off from fire fighting to enter drains or water courses.
Combustion products	:	Fire will produce smoke containing hazardous combustion products (see section 10).
Special protective equipment for fire-fighters	:	In the event of fire, wear self-contained breathing apparatus.
Further information	:	Use water spray to cool unopened containers. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

See also Section 9. Physical and chemical properties: Safety data

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	:	Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition.
Environmental precautions	:	Prevent product from entering drains. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods for cleaning up / Methods for containment	:	Keep wetted with water. Soak up with inert absorbent material and dispose of as hazardous waste. Confinement must be avoided. Pick up and arrange disposal without creating dust. Keep in suitable, closed containers for disposal. Never return spills in original containers for re-use.
Additional advice	:	For personal protection see section 8.

7. HANDLING AND STORAGE

Handling

Advice on safe handling	:	For personal protection see section 8. Avoid formation of respirable particles. Persons with a history of skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used. Smoking, eating and drinking should be prohibited in the application area. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations. Avoid contact with skin, eyes and clothing.
Advice on protection against	:	Use explosion protected equipment.

fire and explosion		Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition - No smoking. No sparking tools should be used. Keep away from reducing agents (e.g. amines), acids, alkalies and heavy metal compounds (e.g. accelerators, driers, metal soaps). Do not cut or weld on or near this container even when empty. Keep away from combustible material.
Temperature class	:	It is recommended to use electrical equipment of temperature group T3. However, autoignition can never be excluded.

Storage

Requirements for storage areas and containers	:	No smoking. Keep in a well-ventilated place. Electrical installations / working materials must comply with the technological safety standards. Keep only in original container. Store away from other materials.
Maximum storage temperature:	:	25 °C (77 °F)
Other data	:	No decomposition if stored and applied as directed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Ingredients with workplace control parameters

Ingredients	CAS-No.	Value	Control parameters	Update	Basis	Form of exposure
Dibenzoyl peroxide	94-36-0	TWA	5 mg/m3	2013-03-01	ACGIH	
	Further information	:	Upper Respiratory Tract irritation Skin irritation A4: Not classifiable as a human carcinogen			
		TWA	5 mg/m3	2013-10-08	NIOSH REL	
		TWA	5 mg/m3	1997-08-04	OSHA Z-1	
		TWA	5 mg/m3	1989-01-19	OSHA P0	
zinc distearate	557-05-1	TWA	5 mg/m3	2013-10-08	NIOSH REL	Respirable
		TWA	10 mg/m3	2013-10-08	NIOSH REL	total
		TWA	15 mg/m3	2007-01-01	OSHA Z-1	total dust
		TWA	5 mg/m3	2007-01-01	OSHA Z-1	respirable fraction
		TWA	10 mg/m3	2013-03-01	ACGIH	
	Further information	:	Upper Respiratory Tract irritation Eye irritation Skin irritation J: Does not include stearates of toxic metals. A4: Not classifiable as a human carcinogen varies: varies			
		TWA	10 mg/m3	1989-01-19	OSHA P0	Total dust

		TWA	5 mg/m3	1989-01-19	OSHA P0	respirable dust fraction

STEL: Short term exposure limit
TWA: Time Weighted Average

Engineering measures
Explosion proof ventilation recommended.
Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protective equipment

Eye/face protection	:	Tightly fitting safety goggles
Hand protection	:	Glove material: butyl-rubber
	:	Glove material: Neoprene
Skin and body protection	:	Protective suit
Respiratory protection	:	Handle in accordance with good industrial hygiene and safety practice.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice. When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday. Wash contaminated clothing before re-use.

Environmental exposure controls

General advice	:	Prevent product from entering drains. If the product contaminates rivers and lakes or drains inform respective authorities.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	:	paste
Color	:	white
Odor	:	faint
Odor Threshold	:	No data available

Safety data

pH	:	not determined
Melting point	:	No data available
Boiling point/boiling range	:	Decomposes below the boiling point.
Flash point	:	Above the SADT value

Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	Decomposition products may be flammable.
Lower explosion limit	:	No data available
Upper explosion limit	:	No data available
Vapor pressure	:	not determined
Relative vapor density	:	10.8 at 20 °C Solvent, (Air = 1.0)
Relative density	:	1.2 at 20 °C
Water solubility	:	at 20 °C partly soluble
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	Test method not applicable
Decomposition temperature	:	SADT - (Self accelerating decomposition temperature) is the lowest temperature at which self accelerating decomposition may occur with a substance in the packaging as used in transport. A dangerous self-accelerating decomposition reaction and, under certain circumstances, explosion or fire can be caused by thermal decomposition at and above the SADT. Contact with incompatible substances can cause decomposition below the SADT.
Self-Accelerating decomposition temperature (SADT)	:	50 °C
Viscosity, dynamic	:	at 20 °C thixotropic
Viscosity, kinematic	:	thixotropic
Explosive properties	:	Not explosive
Oxidizing properties	:	Not classified as oxidizing.
Active Oxygen Content	:	3.25 %
Organic peroxides	:	50 %

This material safety datasheet only contains information relating to safety and does not replace any product information or product specification.

10. STABILITY AND REACTIVITY

Conditions to avoid	:	A high degree of confinement must be avoided. Heat, flames and sparks. For safety, store below:

25 °C
(77 °F)

Materials to avoid	:	Contact with incompatible materials will result in hazardous decomposition. For queries regarding the suitability of other materials please contact the supplier. Do not mix with peroxide accelerators, unless under controlled processing. Use only stainless steel 316, PP, polyethylene or glass-lined equipment. Acids and bases Iron Copper Reducing agents Heavy metals Rust
Hazardous decomposition products	:	Carbon oxides Benzoic acid
Thermal decomposition	:	SADT - (Self accelerating decomposition temperature) is the lowest temperature at which self accelerating decomposition may occur with a substance in the packaging as used in transport. A dangerous self-accelerating decomposition reaction and, under certain circumstances, explosion or fire can be caused by thermal decomposition at and above the SADT. Contact with incompatible substances can cause decomposition below the SADT.
Reactivity	:	Stable under normal conditions.
Chemical stability	:	Stable under recommended storage conditions.
Hazardous reactions	:	No dangerous reaction known under conditions of normal use.
Self-Accelerating decomposition temperature (SADT)	:	50 °C (122 °F)

11. TOXICOLOGICAL INFORMATION

PRODUCT INFORMATION:

Toxicology Assessment

Further information	:	No further data available.

Test result

Acute oral toxicity	:	Acute toxicity estimate: > 5,000 mg/kg Method: Calculation method
Acute dermal toxicity	:	Acute toxicity estimate: > 5,000 mg/kg Method: Calculation method

Carcinogenicity:

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

TOXICOLOGY DATA FOR THE INGREDIENTS:

Toxicology Assessment

Component: Dibenzoyl peroxide

CMR effects	:	Carcinogenicity: Not carcinogenic. Mutagenicity: Not mutagenic. Teratogenicity: No toxicity to reproduction

Test result

Component: Dibenzoyl peroxide

Acute oral toxicity	:	LD50: > 5,000 mg/kg Species: Rat
Acute inhalation toxicity	:	LC50 (Rat): > 24.3 mg/l Exposure time: 4 h Test atmosphere: vapor Assessment: The substance or mixture has no acute inhalation toxicity
Skin irritation	:	slight irritation
Eye irritation	:	Result: Irritation to eyes, reversing within 7 days
Germ cell mutagenicity		
Genotoxicity in vitro	:	Result: No evidence of genotoxic effects in vitro.
Genotoxicity in vivo	:	Result: No evidence of genotoxic effects in vivo.
Reproductive toxicity/Fertility	:	Species: Rat, male Application Route: Oral General Toxicity Parent: NOAEL (No observed adverse effect level): 1,000 mg/kg body weight/day Method: OECD Test Guideline 422 Species: Rat, females Application Route: Oral General Toxicity Parent: NOAEL (No observed adverse effect level): 500 mg/kg body weight/day

Method: OECD Test Guideline 422

Target Organ Systemic Toxicant - Single exposure	:	Routes of exposure: Ingestion The substance or mixture is not classified as specific target organ toxicant, single exposure.
Target Organ Systemic Toxicant - Repeated exposure	:	Routes of exposure: Ingestion The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
Aspiration toxicity	:	No aspiration toxicity classification

Component: zinc distearate

Acute oral toxicity	:	LD50: > 5,000 mg/kg Species: Rat
Aspiration toxicity	:	No aspiration toxicity classification

12. ECOLOGICAL INFORMATION

PRODUCT INFORMATION:

Ecotoxicology Assessment

Additional ecological information	:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Very toxic to aquatic life with long lasting effects. Harmful to aquatic life with long lasting effects.

Further information on ecology

Hazardous to the ozone layer

Regulation	:	40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks	:	This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

INGREDIENTS:

Ecotoxicology Assessment

Component: Dibenzoyl peroxide

Acute aquatic toxicity	:	Very toxic to aquatic organisms.
Chronic aquatic toxicity	:	This product has no known ecotoxicological effects.

Component: zinc distearate

Acute aquatic toxicity	:	Very toxic to aquatic life.

Test result

Component: Dibenzoyl peroxide

Ecotoxicity effects

Toxicity to fish	:	LC50: 0.06 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50: 0.11 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea)
Toxicity to algae	:	EC50: 0.06 mg/l Exposure time: 72 h Species: algea
M-Factor	:	10
Toxicity to bacteria	:	EC50: 35 mg/l Species: Bacteria

Elimination information (persistence and degradability)

Bioaccumulation	:	Bioconcentration factor (BCF): 66.6
Biodegradability	:	Result: Inherently biodegradable.

Component: zinc distearate

Ecotoxicity effects

Toxicity to fish (Chronic toxicity)	:	NOEC: 0.172 mg/l Exposure time: 30 d Test Type: flow-through test Information given is based on data obtained from similar substances.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Lowest observable effect level: 1 mg/l Exposure time: 21 d reproduction rate Species: Daphnia magna (Water flea) Method: OECD Test Guideline 211 Information given is based on data obtained from similar substances.

Elimination information (persistence and degradability)

Biodegradability	:	Result: Readily biodegradable.

13. DISPOSAL CONSIDERATIONS

Product	:	The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Hazardous waste Dispose of contents/container in accordance with local

regulation.

Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not burn, or use a cutting torch on, the empty drum. Due to the high risk of contamination recycling/recovery is not recommended. Follow all warnings even after the container is emptied.

14. TRANSPORT INFORMATION

International Regulation

IATA-DGR

UN/ID No.	:	UN 3108
Proper shipping name	:	Organic peroxide type E, solid (Dibenzoyl peroxide)
Class	:	5.2
Subsidiary risk	:	HEAT
Packing group	:	Not Assigned
Labels	:	5.2 (HEAT)
Packing instruction (cargo aircraft)	:	570
Packing instruction (passenger aircraft)	:	570
Environmentally hazardous	:	no

IMDG-Code

UN number	:	UN 3108
Proper shipping name	:	ORGANIC PEROXIDE TYPE E, SOLID (Dibenzoyl peroxide)
Class	:	5.2
Packing group	:	Not Assigned
Labels	:	5.2
EmS Code	:	F-J, S-R
Marine pollutant	:	yes (Dibenzoyl peroxide)

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation

49 CFR

UN/ID/NA number	:	UN 3108
Proper shipping name	:	Organic peroxide type E, solid
	:	(Dibenzoyl peroxide, 50%)
Class	:	5.2
Packing group	:	II
Labels	:	5.2
ERG Code	:	145
Marine pollutant	:	yes (Dibenzoyl peroxide)
Reportable Quantity	:	This product does not contain an environmentally hazardous substance per 49 CFR 172.101, Appendix A.

15. REGULATORY INFORMATION

Notification status

CH INV	:	YES. On the inventory, or in compliance with the inventory
TSCA	:	YES. All chemical substances in this product are either listed on the TSCA Inventory or in compliance with a TSCA Inventory exemption.
DSL	:	YES. All components of this product are on the Canadian DSL.
AICS	:	YES. On the inventory, or in compliance with the inventory
NZIoC	:	NO. On the inventory, or in compliance with the inventory
ENCS	:	YES. On the inventory, or in compliance with the inventory
ISHL	:	YES. On the inventory, or in compliance with the inventory
KECI	:	YES. On the inventory, or in compliance with the inventory
PICCS	:	YES. On the inventory, or in compliance with the inventory
IECSC	:	YES. On the inventory, or in compliance with the inventory

For explanation of abbreviations, see section 16.

TSCA list	:	Not relevant
OSHA Hazards	:	Organic Peroxide, Skin sensitizer

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards	:	Reactivity Hazard Acute Health Hazard
SARA 302	:	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA 313	:	The following components are subject to reporting levels established by SARA Title III, Section 313: zinc distearate 557-05-1 Dibenzoyl peroxide 94-36-0

Clean Air Act

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 12 (40 CFR 61).

This product does not contain any chemicals subject to disclosure and listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product contains the following toxic pollutants listed under the U.S. Clean Water Act Section 307

zinc distearate 557-05-1

US State Regulations

Massachusetts Right To Know

Dibenzoyl peroxide 94-36-0 50 - 70 %

zinc distearate	557-05-1	1 - 5 %

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California Prop. 65

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

16. OTHER INFORMATION

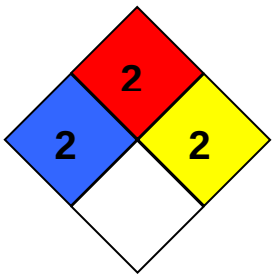
Full text of H-Statements

H241	:	Heating may cause a fire or explosion.
H317	:	May cause an allergic skin reaction.
H320	:	Causes eye irritation.
H400	:	Very toxic to aquatic life.

Further information

HMIS Classification : Health Hazard: 2
Flammability: 2
Physical hazards: 2

NFPA Classification : Health Hazard: 2
Fire Hazard: 2
Reactivity Hazard: 2



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Notification status explanation

REACH	1907/2006 (EU)
CH INV	Switzerland. New notified substances and declared preparations
TSCA	United States TSCA Inventory
DSL	Canadian Domestic Substances List (DSL)
AICS	Australia Inventory of Chemical Substances (AICS)
NZIoC	New Zealand. Inventory of Chemical Substances
ENCS	Japan. ENCS - Existing and New Chemical Substances Inventory
ISHL	Japan. ISHL - Inventory of Chemical Substances
KECI	Korea. Korean Existing Chemicals Inventory (KECI)
PICCS	Philippines Inventory of Chemicals and Chemical Substances (PICCS)
IECSC	China. Inventory of Existing Chemical Substances in China (IECSC)

Further information

Revision Date	04/26/2015

The information in this material safety data sheet should be provided to all who will use, handle, store, transport or otherwise be exposed to this product. The user must determine the appropriate measures that need to be implemented for the use and handling of this product in the c ontext of the user's operations and use of this product. The information contained herein supersedes all previously issued bulletins on the subject matter covered. If the date on this document is more than three years old,call to make certain that this sheet is current. No warranty is made as to the product's merchantability or fitness for any particular purpose, or that any suggested use will not infringe any patent. User must determine for himself, by preliminary tests or otherwise, the suitability of this product for his purposes, including mixing with other products. Nothing contained herein shall be construed as granting or extending any license under any patent.

The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.