

LTS RESEARCH LABORATORIES, INC.  
MATERIAL SAFETY DATA SHEET  
ZINC OXIDE PHOSPHORUS OXIDE

GENERAL

MANUFACTURER/SUPPLIER: LTS RESEARCH LABORATORIES, INC.

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COMPANY'S CITY: ORANGEBURG  
COMPANY'S STATE: NEW YORK  
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DATE MSDS PREPARED: 02/03/00  
DATE MSDS REVISED: 11/05/12

1. PRODUCT IDENTIFICATION

PRODUCT NAME: ZINC OXIDE-PHOSPHORUS OXIDE  
CHEMICAL NATURE: METAL OXIDE  
FORMULA: ZnO (P DOPED)  
CAS #: 1314-13-2/1314-56-3

2. PHYSICAL AND CHEMICAL CHARACTERISTICS

BOILING POINT: N/A  
MELTING POINT: N/A  
MOLECULAR WEIGHT: N/A  
VAPOR DENSITY: N/A  
VAPOR PRESSURE: N/A  
SPECIFIC GRAVITY: N/A  
% VOLATILES: N/A  
SOLUBILITY IN H<sub>2</sub>O: INSOLUBLE  
APPEARANCE AND ODOR: WHITE POWDER, ODORLESS

3. HAZARD IDENTIFICATION

HAZARDS DESCRIPTION:  
ZINC OXIDE: N DANGEROUS FOR THE ENVIRONMENT  
PHOSPHORUS OXIDE: C CORROSIVE

HMIS RATING:  
ZINC OXIDE:  
HEALTH: 2  
FLAMMABILITY: 0  
REACTIVITY: 0  
PHOSPHORUS OXIDE:  
HEALTH: 3  
FLAMMABILITY: 0  
REACTIVITY: 3

4. FIRE FIGHTING MEASURES

FLASH POINT: N/A  
AUTOIGNITION TEMPERATURE: N/A  
FLAMMABLE LIMITS:  
UPPER: N/A  
LOWER: N/A  
EXTINGUISHING MEDIA: SPECIAL POWDER FOR METAL FIRES. DO NOT USE WATER.  
SPECIAL FIRE FIGHTING

PROCEDURES:

FIREFIGHTERS MUST WEAR FULL FACE, SELF-CONTAINED BREATHING APPARATUS WITH FULL PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES. ISOLATE RUNOFF TO PREVENT ENVIRONMENTAL POLLUTION.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

WHEN HEATED TO DECOMPOSITION ZINC OXIDE MAY EMIT TOXIC FUMES OF ZnO. PHOSPHORUS OXIDE IS NON-COMBUSTIBLE BUT CAN CAUSE HIGH LOCAL TEMPERATURES WHEN IN CONTACT WITH WATER, GENERATING ENOUGH HEAT TO IGNITE OTHER MATERIALS.

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5. HEALTH HAZARD INFORMATION

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ACUTE EFFECTS:

INHALATION:

MAY CAUSE DAMAGE TO THE RESPIRATORY TRACT, NASOPHARYNGITIS AND LARYNGITIS.

INGESTION:

MEY BE CORROSIVE

SKIN:

IRRITANT, PHOSPHORUS OXIDE HAS A STRONG CORROSIVE EFFECT ON SKIN AND MUCOUS MEMBRANES. AVOID CONTACT WITH SKIN AND HANDLE WITH CARE

EYE:

IRRITANT, PHOSPHORUS OXIDE HAS A STRONG CORROSIVE EFFECT

CHRONIC EFFECTS:

ZINC COMPOUNDS HAVE VARIABLE LOW TOXICITY. ZINC IS NOT INHERENTLY A TOXIC ELEMENT. HOWEVER, WHEN HEATED IT EVOLVES A FUME OF ZINC OXIDE WHICH MAY CAUSE METAL FUME FEVER. EFFECTS INCLUDE DRY THROAT, METALLIC TASTE, CHEST PAIN, DYSPNEA, RALES, AND DRY COUGH. CHILLS MAY OCCUR WITH LASSITUDE, MALAISE, FATIGUE, HEADACHE, BACK PAIN, MUSCLE CRAMPS, BLURRED VISION, NAUSEA, FEVER, PERSPIRATION, VOMITING, AND LEUKOCYTOSIS. CORROSIVE MATERIALS ARE ACUTELY DESTRUCTIVE TO THE RERSPIRATORY TRACT, EYES, SKIN AND DIGESTIVE TRACT. EYE CONTACT MAY RESULT IN PERMAMENT DAMAGE AND COMPLETE VISION LOSS. INHALATION MAY RESULT IN RESPIRATORY EFFECTS SUCH AS INFLAMMATION, EDEMA, AND CHEMICAL PNEUMONITIS. MAY CAUSE COUGHING, WHEEZING, LARYNGITIS, SHORTNESS OF BREATH, HEADACHE, NAUSEA, AND VOMITING. INGESTION MAY CAUSE DAMAGE TO THE MOUTH, THROAT AND ESOPHAGIS. MAY CAUSE SKIN BURNS OR IRRITATIN DEPENING ON THE SEVERITY OF THE EXPOSURE. CHRONIC INGESTION OR INHALATION OF PHOSPHORUS OXIDE MAY RESLUT IT SYSTEMIC PHOSPHORUS POISONING. LIVER DAMAGE, KIDNEY DAMAGE, JAW/TOOTH ABNORMALITIES, BLOOD DISORDERS, AND CARDIOVASCULAR EFFECTS CAN RESULT.

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6. STABILITY

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STABILITY:

STABLE

CONDITION TO AVOID:

MOISTURE

MATERIAL TO AVOID:

ALUMINUM, HEXACHLOROETHANE, CHLORINATED RUBBER, LINSEED OIL, MAGMESIUM, WATER, OXIDIZING AGENTS

HAZARDOUS

DECOMPOSITION PRODUCTS:

ZINC OXIDE, PHOSPHORUS OXIDE

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7. EMERGENCY AND FIRST AID PROCEDURES:

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INHALATION: REMOVE TO FRESH AIR; KEEP WARM AND QUIET; GIVE OXYGEN IF BREATHING IS DIFFICULT AND SEEK MEDICAL ATTENTION.

INGESTION: SEEK IMMEDIATE MEDICAL ATTENTION.

SKIN: REMOVE CONTAMINATED CLOTHING, BRUSH MATERIAL OFF SKIN, WASH AFFECTED AREA WITH MILD SOAP AND WATER. SEEK MEDICAL ATTENTION.

EYE: RINSE EYE FOR SEVERAL MINUTES UNDER RUNNING WATER. SEEK MEDICAL ATTENTION

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#### 8. HANDLING AND STORAGE

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HANDLING AND STORAGE STORE IN COOL, DRY PLACE IN TIGHTLY SEALED CONTAINERS. KEEP AWAY FROM WATER AND FLAMMABLE MATERIALS.

OTHER PRECAUTIONS: NORMAL LAB COAT.

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#### 9. SPILL OR LEAK PROCEDURES

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STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: WEAR APPROPRIATE RESPIRATORY AND PROTECTIVE EQUIPMENT. ISOLATE SPILLED AREA AND PROVIDE VENTILATION. VACUUM UP SPILL AREA WITH HIGH EFFICIENCY PARTICULATE ABSOLUTE AIR FILTER AND PROVIDE VENTILATION TAKE CARE NOT RAISE DUST.

WASTE DISPOSAL METHOD: IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION: NIOSH/MSHA APPROVED DUSR RESPIRATOR.

VENTILATION: LOCAL EXHAUST VENTILATION MAY BE NECESSARY TO CONTROL ANY AIR CONTAMINANTS TO WITHIN THEIR PELS OR TLVs DURING THE USE OF THIS PRODUCT. GOOD GENERAL EXHAUST IS RECOMMENDED.

PROTECTIVE GLOVES: RUBBER GLOVES

EYE PROTECTION: SAFETY GLASSES

OTHER PROTECTIVE EQUIPMENT OR CLOTHING: PROECTIVE GEAR SUITABLE TO PREVENT CONTAMINATION.

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#### 10. TOXICITY DATA

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LD/LC50 VALUES:

ZINC OXIDE:

ORAL (LD50)	7950 MG/KG (MOUSE)
	>8437 MG/KG (RAT)
ORAL (LDLO)	500 MG/KG
INHALATION (LC50)	2500 MG/M3 (MOUSE)
IRRITATION OF SKIN	500 MG/24H (RABBIT)
IRRITATION OF EYES	500 MG/24H (RABBIT)

PHOSPHORUS OXIDE:

INHALATION (LC50)	1217 MG/M3 (RAT)
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CARCINOGENICITY: NO CLASSIFICATION DATA FOR THE CARCINOGENICITY OF THIS MATERIAL IS AVAILABLE

ADDITIONAL INFORMAIION: TO THE BEST OF OUR KNOWLEDGE THE ACUTE AND CHRONIC TOXICITY OF THIS MATERIAL IS NOT FULLY KNOWN.

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#### 11. TRANSPORTATION DATA

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DOT REGULATIONS: NOT A HAZARDOUS MATERIAL FOR TRANSPORTATION

HAZARD CLASS: N/A

ADR//RID CLASS: N/A

IMDG CLASS: N/A  
AIR TRAN. ICAO/IATA CLASS: N/A  
MARITIME TRAN. IMDG CLASS: N/A

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## 12. REGULATIONS

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### HAZARD SYMBOLS:

ZINC OXIDE: N DANGEROUS FOR THE ENVIRONMENT

PHOSPHORUS OXIDE: C CORROSIVE

### RISK PHRASES:

ZINC OXIDE: 50/53 VERY TOXIC THE AQUATIC ORGNAISMS, MAY CAUSE LONG-TERM ADVERSE EFFECTS IN THE AQUATIC ENVIRONMENT

PHOSPHORUS OXIDE: 35 CAUSES SEVERE BURNS

### SAFETY PHRASES:

ZINC OXIDE: 60 THIS MATERIAL AND ITS CONTAINER MUST BE DISPOSED OF AS HAZARDOUS WASTE

61 AVOID RELEASE TO THE ENVIRONMENT.

PHOSPHORUS OXIDE: 22 DO NOT BREATHE DUST

26 IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER

45 IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE IMMEDIATELY

### NATIONAL REGULATIONS:

ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE U.S. ENVIRONMENTAL PROTECTION AGENCY TOXIC SUBSTANCES CONTROL ACT CHEMICAL SUBSTANCE INVENTORY.

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## 13. OTHER INFORMATION

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THIS SAFETY DATA SHEET SHOULD BE USED IN CONJUNCTION WITH TECHNICAL SHEETS. IT DOES NOT REPLACE THEM. THE INFORMATION GIVEN IS BASED ON OUR KNOWLEDGE OF THIS PRODUCT, AT THE TIME OF PUBLICATION, IT IS GIVEN IN GOOD FAITH. THE ATTENTION OF THE USER IS DRAWN TO THE POSSIBLE RISKS INCURRED BY USING THE PRODUCT FOR ANY OTHER PURPOSE OTHER THAN THAT FOR WHICH IT WAS INTENDED. THIS DOES NOT IN ANY WAY EXCUSE THE USER FROM KNOWING AND APPLYING ALL THE REGULATIONS GOVERNING HIS ACTIVITY. IT IS THE SOLE RESPONSIBILITY OF THE USER TO TAKE ALL PRECAUTIONS REQUIRED IN HANDLING THE PRODUCT. THE AIM OF THE MANDATORY REGULATIONS MENTIONED IS TO HELP THE USER TO FULFILL HIS OBLIGATIONS REGARDING THE USE OF HAZARDOUS PRODUCTS.