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SAFETY DATA SHEET

SECTION 1. CHEMICAL IDENTIFICATION

CATALOG #:	47121
NAME:	Zinc nanopowder (40~60 nm)
SYNONYMS:	
24 HOUR EMERGENCY TELEPHONE:	(800) 535-5053(USA) 352-323-3500 (INTERNATIONAL)
TO REQUEST AN MSDS:	(800) 869-9290
CUSTOMER SERVICE:	(630) 766-2112

SECTION 2. HAZARDS IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

GHS CLASSIFICATION IN ACCORDANCE WITH 29 CFR 1910 (OSHA HCS)

SHORT-TERM (ACUTE) AQUATIC HAZARD (CATEGORY 1), H400

LONG-TERM (CHRONIC) AQUATIC HAZARD (CATEGORY 1), H410

FOR THE FULL TEXT OF THE H-STATEMENTS MENTIONED IN THIS SECTION, SEE SECTION 16.

**GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS
PICTOGRAM**



SIGNAL WORD WARNING

HAZARD STATEMENT(S)

H410 VERY TOXIC TO AQUATIC LIFE WITH LONG LASTING EFFECTS.

PRECAUTIONARY STATEMENT(S)

P273 AVOID RELEASE TO THE ENVIRONMENT.
P391 COLLECT SPILLAGE.
P501 DISPOSE OF CONTENTS/ CONTAINER TO AN APPROVED WASTE DISPOSAL PLANT.

**HAZARDS NOT
OTHERWISE
CLASSIFIED (HNO)
OR NOT COVERED
BY GHS** COMBUSTIBLE DUST

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MF: Zn

MW: 65.39

CAS-NO. 7440-66-6

PURITY: $\geq 99.9\%$ (Trace metals basis)

COMPONENT	CLASSIFICATION	CONCENTRATION
Zinc nanopowder (40~60 nm)		
	AQUATIC ACUTE 1; AQUATIC CHRONIC 1; H400, H410 M-FACTOR - AQUATIC ACUTE: 1 M-FACTOR - AQUATIC CHRONIC: 1	$\leq 100\%$

FOR THE FULL TEXT OF THE H-STATEMENTS MENTIONED IN THIS SECTION, SEE SECTION 16.

SECTION 4. FIRST-AID MEASURES

DESCRIPTION OF FIRST AID MEASURES

GENERAL ADVICE	SHOW THIS MATERIAL SAFETY DATA SHEET TO THE DOCTOR IN ATTENDANCE.
IF INHALED	AFTER INHALATION: FRESH AIR.
IN CASE OF SKIN CONTACT	IN CASE OF SKIN CONTACT: TAKE OFF IMMEDIATELY ALL CONTAMINATED CLOTHING. RINSE SKIN WITH WATER/ SHOWER.
IN CASE OF EYE CONTACT	AFTER EYE CONTACT: RINSE OUT WITH PLENTY OF WATER. REMOVE CONTACT LENSES.
IF SWALLOWED	AFTER SWALLOWING: MAKE VICTIM DRINK WATER (TWO GLASSES AT MOST). CONSULT DOCTOR IF FEELING UNWELL.
MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED	THE MOST IMPORTANT KNOWN SYMPTOMS AND EFFECTS ARE DESCRIBED IN THE LABELLING (SEE SECTION 2.2) AND/OR IN SECTION 11.
INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED	NO DATA AVAILABLE

SECTION 5. FIRE AND EXPLOSION DATA

EXTINGUISHING MEDIA

SUITABLE EXTINGUISHING MEDIA	SUITABLE EXTINGUISHING MEDIA FOAM CARBON DIOXIDE (CO2) DRY POWDER
	UNSUITABLE EXTINGUISHING MEDIA FOR THIS SUBSTANCE/MIXTURE NO LIMITATIONS OF EXTINGUISHING AGENTS ARE GIVEN.
SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE	ZINC/ZINC OXIDES COMBUSTIBLE. DEVELOPMENT OF HAZARDOUS COMBUSTION GASES OR VAPOURS POSSIBLE IN THE EVENT OF FIRE.
ADVICE FOR FIREFIGHTERS	IN THE EVENT OF FIRE, WEAR SELF-CONTAINED BREATHING APPARATUS.
FURTHER INFORMATION	PREVENT FIRE EXTINGUISHING WATER FROM CONTAMINATING SURFACE WATER OR THE GROUND

WATER SYSTEM.

SECTION 6. ACCIDENTAL RELEASE MEASURES

**PERSONAL
PRECAUTIONS,
PROTECTIVE
EQUIPMENT AND
EMERGENCY
PROCEDURES**

ADVICE FOR NON-EMERGENCY PERSONNEL:
EVACUATE THE DANGER AREA, OBSERVE EMERGENCY
PROCEDURES, CONSULT AN EXPERT.
FOR PERSONAL PROTECTION SEE SECTION 8.

**ENVIRONMENTAL
PRECAUTIONS**

DO NOT LET PRODUCT ENTER DRAINS.

**METHODS AND
MATERIALS FOR
CONTAINMENT AND
CLEANING UP**

COVER DRAINS. COLLECT, BIND, AND PUMP OFF
SPILLS. OBSERVE POSSIBLE MATERIAL RESTRICTIONS
(SEE SECTIONS 7 AND 10).

**REFERENCE TO OTHER
SECTIONS**

FOR DISPOSAL SEE SECTION 13.

SECTION 7. HANDLING AND STORAGE

**PRECAUTIONS FOR SAFE
HANDLING**

FOR PRECAUTIONS SEE SECTION 2.2.

**CONDITIONS FOR SAFE
STORAGE, INCLUDING
ANY INCOMPATIBILITIES**

Store at RT

SPECIFIC END USE(S)

APART FROM THE USES MENTIONED IN SECTION 1.2 NO
OTHER SPECIFIC USES ARE STIPULATED.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CONTROL PARAMETERS**COMPONENTS WITH WORKPLACE CONTROL PARAMETERS**

CONTAINS NO SUBSTANCES WITH OCCUPATIONAL EXPOSURE LIMIT VALUES.

EXPOSURE CONTROLS

**APPROPRIATE
ENGINEERING
CONTROLS**

CHANGE CONTAMINATED CLOTHING. WASH HANDS
AFTER WORKING WITH SUBSTANCE.

PERSONAL PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION

USE EQUIPMENT FOR EYE PROTECTION TESTED AND
APPROVED UNDER APPROPRIATE GOVERNMENT
STANDARDS SUCH AS NIOSH (US) OR EN 166(EU).
SAFETY GLASSES

SKIN PROTECTION

HANDLE WITH GLOVES. GLOVES MUST BE INSPECTED
PRIOR TO USE. USE PROPER GLOVE REMOVAL
TECHNIQUE (WITHOUT TOUCHING GLOVE'S OUTER
SURFACE) TO AVOID SKIN CONTACT WITH THIS
PRODUCT. DISPOSE OF CONTAMINATED GLOVES AFTER
USE IN ACCORDANCE WITH APPLICABLE LAWS AND
GOOD LABORATORY PRACTICES. WASH AND DRY
HANDS.

BODY PROTECTION

COMPLETE SUIT PROTECTING AGAINST CHEMICALS,
THE TYPE OF PROTECTIVE EQUIPMENT MUST BE
SELECTED ACCORDING TO THE CONCENTRATION AND
AMOUNT OF THE DANGEROUS SUBSTANCE AT THE
SPECIFIC WORKPLACE.

**RESPIRATORY
PROTECTION**

NOT REQUIRED; EXCEPT IN CASE OF AEROSOL
FORMATION.

**CONTROL OF
ENVIRONMENTAL
EXPOSURE**

DO NOT LET PRODUCT ENTER DRAINS.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Black nanopowder
ODOUR	ODORLESS
ODOUR THRESHOLD	NO DATA AVAILABLE
PH	NO DATA AVAILABLE
MELTING POINT/FREEZING POINT	
INITIAL BOILING POINT AND BOILING RANGE	
FLASH POINT	
EVAPORATION RATE	NO DATA AVAILABLE
FLAMMABILITY (SOLID, GAS)	MAY FORM COMBUSTIBLE DUST CONCENTRATIONS IN AIR.
UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS	NO DATA AVAILABLE

VAPOUR PRESSURE	1.33 HPA AT 487 C
VAPOUR DENSITY	NO DATA AVAILABLE
RELATIVE DENSITY	Bulk density 0.2 - 0.4 g/cm3, True density 7.14 g/cm3
WATER SOLUBILITY	0.0001 G/L AT 20 C - OECD TEST GUIDELINE 105 SLIGHTLY SOLUBLE
PARTITION COEFFICIENT: N- OCTANOL/WATER	NOT APPLICABLE FOR INORGANIC SUBSTANCES
AUTO-IGNITION TEMPERATURE	DOES NOT IGNITE
DECOMPOSITION TEMPERATURE	NO DATA AVAILABLE
VISCOSITY	NO DATA AVAILABLE
EXPLOSIVE PROPERTIES	NO DATA AVAILABLE
OXIDIZING PROPERTIES	NO DATA AVAILABLE

OTHER SAFETY INFORMATION

NO DATA AVAILABLE

SECTION 10. STABILITY AND REACTIVITY

REACTIVITY	NO DATA AVAILABLE
CHEMICAL STABILITY	THE PRODUCT IS CHEMICALLY STABLE UNDER STANDARD AMBIENT CONDITIONS.

**POSSIBILITY OF
HAZARDOUS
REACTIONS**

EXOTHERMIC REACTION WITH:
ALKALI HYDROXIDES
FLUORINE
CARBON DISULFIDE
HALOGEN-HALOGEN COMPOUNDS
ACIDS
ALKALINES
CHLORINE
WITH
MOISTURE.
RISK OF EXPLOSION WITH:
AMMONIUM COMPOUNDS
AZIDES
CHLORATES
METAL CATALYSTS
NITRIC ACID
HYDROXYLAMINE
HYDRAZINE AND DERIVATIVES
HALOGENATED HYDROCARBON
HYDROGEN
NITRATES
PEROXIDES
CADMIUM
CHROMIUM(VI) OXIDE
PEROXI COMPOUNDS
NITRO COMPOUNDS
PERFORMIC ACID
OXIDIZING AGENTS
SULFUR
IODINE
WITH
WATER
RISK OF IGNITION OR FORMATION OF INFLAMMABLE
GASES OR VAPOURS WITH:
ARSENIC OXIDES
SODIUM HYDROXIDE
TELLURIUM
SELENIUM

CONDITIONS TO AVOID

NO DATA AVAILABLE

**INCOMPATIBLE
MATERIALS**

NO DATA AVAILABLE

**HAZARDOUS
DECOMPOSITION
PRODUCTS**

IN THE EVENT OF FIRE: SEE SECTION 5

SECTION 11. TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

ACUTE TOXICITY

LD50 ORAL - RAT - MALE AND FEMALE - > 2,000 MG/KG
(OECD TEST GUIDELINE 401)

LC50 INHALATION - RAT - MALE AND FEMALE - 4 H - >
5.41 MG/L - DUST/MIST
(OECD TEST GUIDELINE 403)

DERMAL: NO DATA AVAILABLE

NO DATA AVAILABLE

**SKIN
CORROSION/IRRITATION**

SKIN - RABBIT
RESULT: NO SKIN IRRITATION - 5 D
REMARKS: (IN ANALOGY TO SIMILAR PRODUCTS)
(ECHA)
THE VALUE IS GIVEN IN ANALOGY TO THE
FOLLOWING SUBSTANCES: ZINC OXIDE

**SERIOUS EYE
DAMAGE/EYE IRRITATION**

EYES - RABBIT
RESULT: NO EYE IRRITATION - 24 H
(OECD TEST GUIDELINE 405)

**RESPIRATORY OR SKIN
SENSITISATION**

MAXIMIZATION TEST - GUINEA PIG
RESULT: NEGATIVE
(OECD TEST GUIDELINE 406)
REMARKS: (IN ANALOGY TO SIMILAR PRODUCTS)
THE VALUE IS GIVEN IN ANALOGY TO THE
FOLLOWING SUBSTANCES: ZINC OXIDE

**GERM CELL
MUTAGENICITY**

TEST TYPE: AMES TEST
TEST SYSTEM: ESCHERICHIA COLI/SALMONELLA
TYPHIMURIUM
METABOLIC ACTIVATION: WITH AND WITHOUT
METABOLIC ACTIVATION
METHOD: OECD TEST GUIDELINE 471
RESULT: NEGATIVE
REMARKS: (IN ANALOGY TO SIMILAR PRODUCTS)

THE VALUE IS GIVEN IN ANALOGY TO THE
FOLLOWING SUBSTANCES: ZINC SULPHATE
TEST TYPE: IN VITRO MAMMALIAN CELL GENE MUTATION
TEST

TEST SYSTEM: MOUSE LYMPHOMA CELLS
METABOLIC ACTIVATION: WITHOUT METABOLIC
ACTIVATION
RESULT: NEGATIVE
REMARKS: (IN ANALOGY TO SIMILAR PRODUCTS)
(ECHA)

THE VALUE IS GIVEN IN ANALOGY TO THE
FOLLOWING SUBSTANCES: ZINC CHLORIDE
TEST TYPE:

CHROMOSOME ABERRATION TEST IN VITRO
TEST SYSTEM: OTHER CELL TYPES
METABOLIC ACTIVATION: WITH AND WITHOUT
METABOLIC ACTIVATION
RESULT: NEGATIVE
REMARKS: (IN ANALOGY TO SIMILAR PRODUCTS)
(ECHA)

THE VALUE IS GIVEN IN ANALOGY TO THE
FOLLOWING SUBSTANCES: ZINC CHLORIDE
TEST TYPE: MICRONUCLEUS TEST
SPECIES: MOUSE
CELL TYPE: RED BLOOD CELLS (ERYTHROCYTES)
APPLICATION ROUTE: INTRAPERITONEAL

RESULT: NEGATIVE
REMARKS: (IN ANALOGY TO SIMILAR PRODUCTS)
(ECHA)

THE VALUE IS GIVEN IN ANALOGY TO THE
FOLLOWING SUBSTANCES: ZINC SULPHATE

CARCINOGENICITY

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.

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.

OSHA:

NO COMPONENT OF THIS PRODUCT PRESENT AT
LEVELS GREATER THAN OR EQUAL TO 0.1% IS ON
OSHA S LIST OF REGULATED CARCINOGENS.

REPRODUCTIVE TOXICITY	NO DATA AVAILABLE
SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE	NO DATA AVAILABLE
SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE	NO DATA AVAILABLE
ASPIRATION HAZARD	NO DATA AVAILABLE
ADDITIONAL INFORMATION	<p>RTECS: ZG8600000</p> <p>REPEATED DOSE TOXICITY - RAT - MALE AND FEMALE - ORAL - 13 WEEKS - NOAEL (NO OBSERVED ADVERSE EFFECT LEVEL) - 31.52 MG/KG - LOAEL (LOWEST OBSERVED ADVERSE EFFECT LEVEL) - 53.8 MG/KG</p> <p>EFFECTS DUE TO INGESTION MAY INCLUDE:, CHILLS, DRY THROAT, SWEET TASTE, FEVER, COUGH, NAUSEA, VOMITING, WEAKNESS, CONTACT WITH EYES OR SKIN MAY CAUSE: IRRITATION</p> <p>TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.</p>

SECTION 12. ECOLOGICAL INFORMATION

TOXICITY	
TOXICITY TO FISH	FLOW-THROUGH TEST LC50 - OTHER FISH - 0.439 MG/L - 96 H
TOXICITY TO DAPHNIA AND OTHER AQUATIC INVERTEBRATES	REMARKS: (ECHA) STATIC TEST EC50 - CERIODAPHNIA DUBIA (WATER FLEA) - 0.155 MG/L 48 H (US-EPA)
TOXICITY TO ALGAE	STATIC TEST NOEC - PSEUDOKIRCHNERIELLA SUBCAPITATA (GREEN ALGAE) - 0.05 MG/L - 3 D (OECD TEST GUIDELINE 201)
TOXICITY TO BACTERIA	STATIC TEST NOEC - ACTIVATED SLUDGE - 0.1 MG/L - 4 H (ISO 9509) REMARKS: (IN ANALOGY TO SIMILAR PRODUCTS)
PERSISTENCE AND DEGRADABILITY	THE METHODS FOR DETERMINING THE BIOLOGICAL DEGRADABILITY ARE NOT APPLICABLE TO INORGANIC SUBSTANCES.

BIOACCUMULATIVE POTENTIAL	THIS SUBSTANCE IS NOT CONSIDERED TO BE PERSISTENT, BIOACCUMULATING AND TOXIC (PBT).
MOBILITY IN SOIL	NO DATA AVAILABLE
RESULTS OF PBT AND VPVB ASSESSMENT	PBT/VPVB ASSESSMENT NOT AVAILABLE AS CHEMICAL SAFETY ASSESSMENT NOT REQUIRED/NOT CONDUCTED
OTHER ADVERSE EFFECTS	NO DATA AVAILABLE

SECTION 13. DISPOSAL CONSIDERATIONS

WASTE TREATMENT METHODS

PRODUCT	WASTE MATERIAL MUST BE DISPOSED OF IN ACCORDANCE WITH THE NATIONAL AND LOCAL REGULATIONS. LEAVE CHEMICALS IN ORIGINAL CONTAINERS. NO MIXING WITH OTHER WASTE.
CONTAMINATED PACKAGING	DISPOSE OF AS UNUSED PRODUCT.

SECTION 14. TRANSPORT INFORMATION

DOT (US)

PROPER SHIPPING NAME:	ZINC POWDER
UN NUMBER:	1436
CLASS:	4.3 (4.2)
PACKING GROUP:	II
REPORTABLE QUANTITY (RQ):	1000 LBS
POISON INHALATION HAZARD:	NO

IMDG

PROPER SHIPPING NAME:	ZINC POWDER
UN NUMBER:	1436
CLASS:	4.3 (4.2)
PACKING GROUP:	II
EMS-NO:	F-G, S-O
MARINE POLLUTANT:	YES

IATA

PROPER SHIPPING NAME:	ZINC POWDER
UN NUMBER:	1436

CLASS: 4.3 (4.2)
PACKING GROUP: II

SECTION 15. REGULATORY INFORMATION

SARA 302 COMPONENTS THIS MATERIAL DOES NOT CONTAIN ANY COMPONENTS WITH A SECTION 302 EHS TPQ.

SARA 313 COMPONENTS

THE FOLLOWING COMPONENTS ARE SUBJECT TO REPORTING LEVELS ESTABLISHED BY SARA TITLE III, SECTION 313:

	CAS-No.	REVISION DATE
Zinc nanopowder (40~60 nm)	7440-66-6	02-16-1993

SARA 311/312 HAZARDS REACTIVITY HAZARD

MASSACHUSETTS RIGHT TO KNOW COMPONENTS

NO COMPONENTS ARE SUBJECT TO THE MASSACHUSETTS RIGHT TO KNOW ACT.

SECTION 16. OTHER INFORMATION

FULL TEXT OF H-STATEMENTS REFERRED TO UNDER SECTIONS 2 AND 3.

H410 VERY TOXIC TO AQUATIC LIFE WITH LONG LASTING EFFECTS.

MSDS LEGEND

MW:	MOLECULAR WEIGHT
MF:	MOLECULAR FORMULA
VOC:	VOLATILE ORGANIC COMPOUNDS
ACGIH:	AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGINISTS
CAS:	CHEMICAL ABSTRACTS SERVICE REGISTRY NUMBER
OSHA:	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PEL:	PERMISSIBLE EXPOSURE LIMIT (OSHA)
TLV:	THRESHOLD LIMIT VALUE (ACGIH)

IMPORTANT:

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