

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	Zirconium, Enriched Zirconium
Chemical Formula	Zr
Molecular Weight	91.22 amu
CAS No.	7440-67-7
RTECS No.	ZH7070000
Synonyms	Zircat, Zirconium metal
Supplier Address*	ISOFLEX USA PO Box 472615 San Francisco CA 94147 United States
Telephone	+1 415-440-4433
Fax	+1 415-563-4433
Emergency Phone Number (both supplier and manufacturer)	Infotrac / +1 800-535-5053
Email	*May include subsidiaries or affiliate companies/divisions iusa@isoflex.com
Website	www.isoflex.com
Preparation Information	ISOFLEX USA Product Safety +1 415-440-4433

2. HAZARDS IDENTIFICATION

Emergency Overview: Pyrophoric (USA). Highly Flammable (EU). Irritant. Contact with water liberates extremely flammable gases. Spontaneously flammable in air. Irritating to eyes, respiratory system and skin.

NFPA Ratings: (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health Hazard = 2 Flammability = 4 Reactivity = 2 Special Hazard = W



HMS Ratings: (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health Hazard = 2 Flammability = 4 Physical Hazard = 2

HEALTH HAZARD	2
FLAMMABILITY	4
PHYSICAL HAZARD	2

Potential Health Effects

<i>Skin Contact</i>	Causes skin irritation
<i>Skin Absorption</i>	May be harmful if absorbed through the skin
<i>Eye Contact</i>	Causes eye irritation
<i>Inhalation</i>	May be harmful if inhaled; material is irritating to mucous membranes and upper respiratory tract
<i>Ingestion</i>	May be harmful if swallowed

For additional information on toxicity, please refer to Section 11.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name:	Zirconium
CAS No.:	7440-67-7
Chemical Formula:	Zr
Molecular Weight:	91.22 amu

4. FIRST AID MEASURES

<i>Oral Exposure</i>	If swallowed, wash out mouth with water provided person is conscious. Call a physician.
<i>Inhalation Exposure</i>	If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.
<i>Dermal Exposure</i>	In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.
<i>Eye Exposure</i>	In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

5. FIREFIGHTING MEASURES

<i>Flammable Hazards</i>	Yes
<i>Pyrophoric/Autoignition</i>	Yes
<i>Conditions of Flammability</i>	Catches fire if exposed to air
<i>Flash Point</i>	N/A
<i>Autoignition Temperature</i>	N/A
<i>Flammability</i>	N/A
<i>Suitable Extinguishing Media</i>	Use approved class D extinguishers or smother with dry sand, dry ground limestone, or dry clay
<i>Unsuitable Extinguishing Media</i>	Do not use water or carbon dioxide extinguisher on this material.

Firefighting

<i>Protective Equipment</i>	Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
<i>Specific Hazard(s)</i>	Pyrophoric material. Emits toxic fumes under fire conditions.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

Evacuate area. Shut off all sources of ignition. Use non-sparking tools. Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves. Avoid dust formation. Avoid breathing vapors, mist or gas.

Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods for Cleaning Up

Avoid raising dust. Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

7. HANDLING AND STORAGE

Handling

Avoid contact with eyes, skin, and clothing. Avoid breathing dust. Avoid prolonged or repeated exposure.

Storage

Keep container closed. Keep away from heat, sparks, and open flame. Handle and store under nitrogen. Handle and store under inert gas.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls

Safety shower and eye bath. Use non-sparking tools. Use only in a chemical fume hood.

Exposure Limits, RTECS

Country

USA

Source
Value

Type

ACGIH
10 mg/m³

STEL

USA

ACGIH
5 mg/m³

TWA

USA

MSHA Standard-air
5 mg/m³

TWA

USA

OSHA
8H TWA 5 mg(Zr)/m³

PEL

New Zealand

OEL

USA

NIOSH
5 mg/m³

TWA

STEL

10 mg/m³

Personal Protective Equipment

Respiratory

Government approved respirator

Hand

Compatible chemical-resistant gloves

Eye

Chemical safety goggles

General Hygiene Measures

Wash thoroughly after handling

9. PHYSICAL AND CHEMICAL PROPERTIES

	Appearance		
<i>Physical State</i>			Solid
<i>Color</i>			Grey
Safety Data			
Molecular Weight:		91.22 amu	pH:
		N/A	
BP/BP Range:		N/A	MP/MP Range:
		N/A	
Freezing Point:		N/A	Vapor Pressure:
		N/A	
Vapor Density:		N/A	Saturated Vapor Concentration:
	N/A		
SG/Density:		6.49 g/cm ³	Bulk Density:
		N/A	
Odor Threshold:		N/A	Volatile%:
		N/A	
VOC Content:		N/A	Water Content:
		N/A	
Solvent Content:		N/A	Evaporation Rate:
		N/A	
Viscosity:			N/A
			Surface Tension:
Partition Coefficient:	N/A		Decomposition Temperature:
Flash Point:		N/A	Explosion Limits:
		N/A	
Flammability:		N/A	Autoignition Temperature:
		N/A	
Refractive Index:		N/A	Optical Rotation:
		N/A	
Miscellaneous Data:	N/A		Solubility:
			N/A

10. STABILITY AND REACTIVITY

<i>Stability</i>	Stable
<i>Conditions to Avoid</i>	Air
<i>Materials to Avoid</i>	Water, strong acids, strong oxidizing agents, hydrogen fluoride, phosphorus, oxygen
<i>Hazardous Decomposition Products</i>	Nature of decomposition products not known
<i>Hazardous Polymerization</i>	Will not occur

11. TOXICOLOGICAL INFORMATION

<i>RTECS Number</i>	ZH7070000
<i>Signs and Symptoms of Exposure</i>	To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, NTP, or EPA classification.

ACGIH Carcinogen List: Rating: A4

Acute Toxicity

<i>Inhalation</i>	No data available
<i>Dermal</i>	No data available
<i>Skin Corrosion/Irritation</i>	No data available
<i>Serious Eye Damage/Eye Irritation</i>	No data available
<i>Respiratory or Skin Sensitization</i>	No data available
<i>Germ Cell Mutagenicity</i>	No data available
<i>Reproductive Toxicity</i>	No data available
<i>Specific Target Organ Toxicity / Single Exposure</i>	No data available
<i>Specific Target Organ Toxicity / Repeated Exposure</i>	No data available
<i>Aspiration Hazard</i>	No data available



12. ECOLOGICAL INFORMATION

<i>Toxicity</i>	No data available
<i>Persistence and Degradability</i>	No data available
<i>Bioaccumulative Potential</i>	No data available
<i>Mobility in Soil</i>	No data available
<i>Results of PBT and vPvB Assessment</i>	PBT/vPvB assessment not available, as chemical safety assessment not required/not conducted
<i>Other Adverse Effects</i>	No data available

13. DISPOSAL CONSIDERATIONS

<i>Product</i>	Catalysts and expensive metals should be recovered for reuse or recycling. Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state and local environmental regulations.
<i>Contaminated Packaging</i>	Dispose of as unused product.

14. TRANSPORT INFORMATION**DOT**

<i>Proper Shipping Name</i>	Zirconium powder, dry
<i>UN No.</i>	2008
<i>Class</i>	4.2
<i>Packing Group</i>	Packing Group II
<i>Hazard Label</i>	Spontaneously combustible
<i>PIH</i>	Not PIH

IATA

<i>Proper Shipping Name</i>	Zirconium powder, dry
<i>IATA UN No.</i>	2008
<i>Hazard Class</i>	4.2
<i>Packing Group</i>	II

Contact ISOFLEX for other transportation information.

15. REGULATORY INFORMATION**SARA 302 Components**

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

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.

SARA 311/312 Hazards

Reactivity Hazard, Chronic Health Hazard

Massachusetts Right to Know Components

Zirconium Pyrophoric / CAS No. 7440-67-7 / Revision Date 1991-07-01

Pennsylvania Right to Know Components

Zirconium Pyrophoric / CAS No. 7440-67-7 / Revision Date 1991-07-01

New Jersey Right to Know Components

Zirconium Pyrophoric / CAS No. 7440-67-7 / Revision Date 1991-07-01

California Prop. 65 Components

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

16. OTHER INFORMATION

Prepared By ISOFLEX USA
PO Box 472615
San Francisco CA 94147
United States

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Revision Number 4

Revision Note Update supplier address

ISOFLEX USA's Commonly Used Abbreviations and Acronyms*

ACGIH	American Conference of Governmental Industrial Hygienists
ADR	European Agreement Concerning the International Carriage of Dangerous Goods by Road
AICS	Australian Inventory of Chemical Substances
ALARA	As Low As Is Reasonably Achievable
AMU	Atomic Mass Unit
ANSI	American National Standards Institute
BLS	Basic Life Support
BOD5	Biochemical Oxygen Demand
CAM	Continuous Air Monitor
CAS	Chemical Abstracts Service (division of the American Chemical Society)
CEN	European Committee for Standardization
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CLP	Classification, Labelling and Packaging (European Union)
COD	Chemical Oxygen Demand
CPR	Controlled Products Regulations (Canada)
CWA	Clean Water Act (USA)
DAC	Derived Air Concentration (USA)
DOE	United States Department of Energy (USA)
DOT	United States Department of Transportation (USA)
DSL	Domestic Substances List (Canada)
EC50	Half Maximal Effective Concentration
ECL	Korean Existing Chemicals List
EINECS	European Inventory of Existing Commercial Chemical Substances
EHS	Environmentally Hazardous Substance
ELINCS	European List of Notified Chemical Substances
EMS	Emergency Response Procedures for Ships Carrying Dangerous Goods
EPA	Environmental Protection Agency (USA)
EPCRA	Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986
GHS	Globally Harmonized System
HMIS	Hazardous Materials Identification System (USA)
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IBC	Intermediate Bulk Containers
ICAO	International Civil Aviation Organization
IDLH	Immediately Dangerous to Life or Health
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
IMDG	International Maritime Code for Dangerous Goods
LC50	Lethal concentration, 50 percent
LD50	Lethal dose, 50 percent
LDLO	Lethal Dose Low
LOEC	Lowest-Observed-Effective Concentration
MARPOL	International Convention for the Prevention of Pollution from Ships
MSHA	Mine Safety and Health Administration (USA)
NCRP	National Council on Radiation Protection & Measurements (USA)
NDSL	Non-Domestic Substances List (Canada)

NFPA	National Fire Protection Association (USA)
NIOSH	National Institute for Occupational Safety and Health (USA)
NOEC	No Observed Effect Concentration
N.O.S.	Not Otherwise Specified
NRC	Nuclear Regulatory Commission (USA)
NTP	National Toxicology Program (USA)
OSHA	Occupational Safety and Health Administration (USA)
PBT	Persistent Bioaccumulative and Toxic Chemical
PEL	Permissible Exposure Limit
PICCS	Philippines Inventory of Chemicals and Chemical Substances
PIH	Poisonous by Inhalation Hazard
RCRA	Resource Conservation and Recovery Act (USA)
RCT	Radiation Control Technician
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals (Europe)
RID	Regulations Concerning the International Transport of Dangerous Goods by Rail
RQ	Reportable Quantity
RTECS	Registry of Toxic Effects of Chemical Substances
SARA	Superfund Amendments and Reauthorization Act (USA)
SNUR	Significant New Use Rule (TSCA)
TDG	Transportation of Dangerous Goods (Canada)
TIH	Toxic by Inhalation Hazard
TLV	Threshold Limit Value
TPQ	Threshold Planning Quantity
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average
UN	United Nations (Number)
VOC	Volatile Organic Compound
vPvB	Very Persistent Very Bioaccumulative Chemical
WGK	Wassergefährdungsklassen (Germany: Water Hazard Classes)
WHMIS	Workplace Hazardous Materials Information System

*One or more of the above-listed items may not appear in this document.

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