

Product name: Zirconium, 99.5% pure in various forms
Document Nr.: SDS00170ZR5708

Date: October 5th 2022
Version: 4.0

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Section 1: Identification of the substance or mixture and the company

1.1. Product Identifier

Solid Zirconium (Zr), 99.5% pure in various manufactured forms. EC #: 231-176-9 CAS #: 7440-67-7
The substance is not subject to registration according to REACH

1.2 Relevant applications of the material and uses advised against

Target material for vacuum deposition (sputtering)

1.3. Company details

Rave Scientific
100 Franklin Square Dr.
Suite 101
Somerset, NJ 08873
Telephone: 1-732-898-3828
Email: info@ravescientific.com
Web: www.ravescientific.com

1.4 Emergency telephone number

Rave Scientific: 1-732-898-3828

Section 2: Hazards identification

2.1. Classification of the substance or mixture according to Regulation EC Nr. 1272/2008

Physical:	Pyrophoric solid, Category 1, H250
Health:	0
	0
Flammability:	Water reactive, Category 1, H260
Environment:	0
Other hazards:	None

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2.2 Labeling elements

Labelling accordance to Regulation EC. Nr 1272/2008



Hazard pictogram(s):

GHS02

Signal word:

Danger

Hazard statements:

H250: Catches fire spontaneously if exposed to air

H260: In contact with water releases flammable gases which may ignite spontaneously

Precautionary statement(s)

Prevention:

P201: Keep away from children

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

P222: Do not allow contact with air

P223: Do not allow contact with water

P280: Wear eye protection, face protection, protective clothing, protective gloves

P302 +P334: If on skin: Immerse in cool water or wrap in wet bandages

2.3 Other hazards

Results of PBT and vPvB assessment

According to the results of its assessment, the substance is not a PBT or a vPvB

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Section 3: Composition / information on components

3.1. Substances

Solid Zirconium (Zr), 99.5% pure in various manufactured forms. EC #: 231-176-9 CAS #: 7440-67-7

3.2 Mixtures

Not applicable

Section 4: First aid measures

4.1. Description of first aid measures

Contact with eyes:	Rinse cautiously with water for several minutes. If possible, remove contact lenses. Continue rinsing.
Contact with skin:	Wash with water and soap. Seek medical attention if irritation persists.
Inhalation:	Fresh air, keep warm and at rest. Seek medical attention if ill effects occur
Ingestion:	If swallowed, do not induce vomiting Seek immediate medical advice

4.2. Important symptoms and effects, either immediate or delayed

Inhalation:	May cause: Cough. Sore throat. Shortness of breath. Asthma reaction
Ingestion:	May cause gastrointestinal irritation, nausea, vomiting and diarrhea
Skin contact:	May an allergic skin reaction, rash.
Eye contact:	May cause erythema (redness)

4.3. Indication of any immediate medical attention and special treatment

General advice:	If you feel unwell, seek medical advice; show product label if possible If symptoms persist, always call a doctor
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Section 5: Firefighting Measures

5.1. Extinguishing media

Dry agent, D class extinguisher. Do not use water. Do not use carbon dioxide

5.2 Special hazards arising from the substance or mixture

Pyrophoric material. Emits toxic fumes under fire conditions.

5.3 Advice to firefighters

Fight fire from a safe distance, with adequate cover
Do not move the load if exposed to heat.
In case of fire: do not breathe fumes
Wear self-contained breathing apparatus for fire fighting

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Wear protective equipment
Keep unprotected persons away
Shut off all sources of ignition
Use non-sparking tools
Avoid dust formation. Avoid breathing mist, vapours or gas.

6.2 Environmental precautions

Do not allow to enter public sewers and waterways

6.3 Methods and material for containment and clean up

Pick up mechanically. Avoid raising dust.

6.4 Reference to other sections

For further information see section 7, 8 and 13.

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Section 7: Handling and storage

7.1. Precautions for safe handling

Avoid creating or accumulating dust or fine particles
Avoid breathing dust or fumes
Avoid contact with eyes, skin and clothing
Do not eat, drink or smoke when using this product

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed, in a cool, well-ventilated place
Keep away from heat, sparks and open flame
Handle and store under nitrogen or inert gas.
Keep out of reach of children

7.3 Specific end uses(s)

Not required

Section 8: Exposure control and personal protection

8.1. Control parameters

Occupational exposure limits (OEL)

Ingredient	Material Name	Source	TWA	STEL	Ceiling -C	Notes
Zirconium	Zirconium (Zr)	USA	5 mg/m ³	10 mg/m ³	Not available	Not available

8.2 Exposure controls

Control procedures: Avoid creating or accumulating dust or fine particles
Keep sources of ignition away
Wash hands before breaks and at the end of the work
Maintain appropriate working environment

Personal protection: Protective work clothing

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Inhalation:	Use breathing protection with high concentrations	(Contd. of page 5)
Hands and skin:	Suitable gloves	
Eyes:	Wear safety goggles with side protection or full-face protection	

Section 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Appearance/physical state:	Solid in various forms
Colour:	Grey metallic
Odour:	None
pH	Not applicable
Melting point/range:	1855°C
Boiling point/range:	4409°C
Flammability:	The substance is a flammable solid
Flash point:	Not determined
Evaporation rate:	Not available
Explosion limits: upper limit:	Not determined
lower limit:	Not determined
Vapour pressure:	Not applicable
Relative density:	6.49 g/cm ³ @ 20°C
Solubility in water:	No data available
Auto-ignition:	Not determined
Viscosity:	Not applicable

9.2 Other information

None

Section 10: Stability and reactivity**10.1. Reactivity**

No hazardous reactions known if used for its intended purposes

10.2 Chemical stability

Stable under recommended storage conditions

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10.3 Possibility of hazardous reactions

Reacts violently with water

10.4 Conditions to avoid

Avoid creating dust or accumulating dust or fine particles
Air, moisture

10.5 Incompatible materials

Water, Strong oxidizing agents, strong acids, Hydrogen fluoride, phosphorous, oxygen

10.6 Hazardous decomposition products

Not known

Section 11: Toxicological information

11.1. Information on toxicological effects

Information hazard classes as defined in Regulation (EC) Nr. 1272/2008

Inhalation:	Not classified
Skin contact:	Not classified
Eye contact:	Not classified
Sensitisation:	Not classified
Germ cell mutagenicity:	Not classified
Carcinogenicity:	Not classified
Reproductive toxicity:	Not classified
Specific target organ toxicity – single exposure:	Not classified
Specific target organ toxicity – repeated exposure:	Not classified

Toxicological data:

No data available

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11.2. Endocrine disrupting properties

Not listed

11.3. Information on other hazards

There is no additional information

Section 12: Ecological information**12.1. Aquatic toxicity**

No data available

12.2 Persistence and degradability

No information available

12.3 Bio-accumulative potential

Does not significantly accumulate in organisms.

12.4 Mobility in soil

No information available

12.5 Results of PBT and vPvB assessment

Not applicable

12.6 Endocrine disrupting properties

Not listed

12.7 Other adverse effects

Data are not available

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Section 13: Disposal considerations

13.1. Waste treatment methods

Product: This material and its container must be disposed of in a safe way. Do not discharge into drains or the environment, dispose to an authorised waste collection point.

National regulations: Disposal should be in accordance with local, state or national legislation.

Section 14: Transport information

14.1. UN number

UN-number: 2008

14.2 UN proper shipping name

Proper shipping name: ZIRCONIUM

14.3 Transport hazard class(es)

Class: 4.2
ADR/RID-Classification code: 4.2

14.4 Packing group

Packing: II

14.5 Environmental Hazards

No information available

14.6 Special precautions for user

Environmental hazards: None

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC code

Not applicable (Contd. on page 10)

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Section 15: Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**

Zirconium powder: Dangerous substance with restrictions (REACH, Annex VXII) R40
Regulation (EC) No 1005/2009 on substances that deplete the ozone layer, Annex 1&11: not listed
Regulation (EC) No 850/2004 on persistent organic pollutants: not listed
Regulation (EU) No 649/2012 concerning the export and import of dangerous chemicals Annex I, Part1, 2&3: not listed
Regulation (EU) No 649/2012 concerning the export and import of dangerous chemicals Annex V, Not listed
Regulation (EC) No166/2006 Annex II Pollutant release and transfer registry: not listed
Regulation (EC) No 1907/2006, REACH Article 59(10) candidate list: not listed

15.2 Chemical safety assessment

List of substances to authorization (REACH, Annex XIV)/SVHC – candidate list: not listed

Section 16: Other information**RoHS Directive Compliant**

This product is fully compliant with the directive 2100/65/EU Annex II (RoHS). It does not contain any lead, cadmium, mercury, hexavalent chromium, PBB's or PBDE's.

WEEE

This product is not a piece of electrical or electronic equipment, and it therefore not governed by Directive 2002/96/EC on waste electrical and electronic equipment (WEEE)

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Safety Data Sheet

Regulation EC Nr. 1907/2006 Art.31

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Shipping labels:



Abbreviations:

Asp. Tox	Aspiration hazard
Carc.	Carcinogenicity
ErC50	Concentration resulting in a 50% reduction in growth rate with 72 hrs exposure
EC50	Half maximal concentration which induces a response halfway between baseline and maximum effect
Exp.	Exposure
Flam.	Flammable
GHS	Global Harmonised System of Classification of Labelling Chemicals
Irrit.	Irritant
N/A	Not applicable
N/E	Not estimated
NOEC	No observed effect concentration
LC50	Lethal dose single exposure to causing 50% lethality
LD50	Lethal dose 50% corresponds to causing 50% lethality during a specific time
PBT	Persistent Bio accumulative and Toxic
WEL	Workplace Exposure Limit
Repr.	Reproductive toxicant
RoHS	Restriction of Hazardous Substance
SVHC	Substance of very high concern
VOC	Volatile organic compound
vPvB	very Persistent and very Bio accumulative
WEEE	Waste Electrical and Electronic Equipment

Relevant phrases

- H317 - May cause an allergic skin reaction
- H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H413 - May cause long lasting harmful effects to aquatic life

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This product should be stored, handled and used in accordance with good industrial hygiene practices and in accordance with any legal regulation.

The information contained herewith is based on the present state of our knowledge and is intended to describe the product from the point of view of safety requirements. It does not guarantee any specific properties.

It is the responsibility of the user to query and verify any information seeming suspect or where doubt on the validity may exist. The buyer assumes all responsibility of using and handling the product in accordance with local, state, federal and international regulations.

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