

**Material Safety Data Sheet**

According to OSHA and ANSI

Printing date 01/11/2012

Reviewed on 01/06/2012

**1 Identification of the substance/mixture and of the company/undertaking****Product identifier****Product name:** Zirconium powder**Stock number:** 00418**Relevant identified uses of the substance or mixture and uses advised against.****Sector of Use** SU24 Scientific research and development**Details of the supplier of the safety data sheet****Manufacturer/Supplier:**

Alfa Aesar, A Johnson Matthey Company

Johnson Matthey Catalog Company, Inc.

30 Bond Street

Ward Hill, MA 01835-8099

Tel: 800-343-0660

Fax: 800-322-4757

Email: tech@alfa.com

www.alfa.com

**Information Department:** Health, Safety and Environmental Department**Emergency telephone number:**

During normal hours the Health, Safety and Environmental Department at (800) 343-0660. After normal hours call Carechem 24 at (866) 928-0789.

**2 Hazards identification****Classification of the substance or mixture**

GHS02 Flame

H228 Flammable solid.

**Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

F+ Highly flammable

R11: Highly flammable.

**Label elements****Labelling according to EU guidelines:****Code letter and hazard designation of product:**

F Highly flammable

**Risk phrases:**

11 Highly flammable.

**Safety phrases:**

7/8 Keep container tightly closed and dry.

33 Take precautionary measures against static discharges.

**Hazard description:****WHMIS classification**

B4 - Flammable solid

**Classification system****HMIS ratings (scale 0-4)**

(Hazardous Materials Identification System)

HEALTH	1
FIRE	2
REACTIVITY	2

Health (acute effects) = 1

Flammability = 2

Reactivity = 2

**Other hazards****Results of PBT and vPvB assessment****PBT:** Not applicable.**vPvB:** Not applicable.

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**3 Composition/information on ingredients****Chemical characterization: Mixtures****Dangerous components:**

7440-67-7	Zirconium	H250; H260	70.0%
7440-58-6	Hafnium	H251	2.0%

**Additional information**

Zirconium is routinely found with a low level of hafnium since separation of the two elements is difficult.

**Non-Hazardous Ingredients**

7732-18-5	Water	28.0%
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**4 First aid measures****Description of first aid measures****After inhalation**

Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice.

**After skin contact**

Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice.

**After eye contact**

Rinse opened eye for several minutes under running water. Then consult a doctor.

**After swallowing** Seek medical treatment.

**Information for doctor**

**Most important symptoms and effects, both acute and delayed**

No further relevant information available.

**Indication of any immediate medical attention and special treatment needed**

No further relevant information available.

**5 Firefighting measures****Extinguishing media**

**Suitable extinguishing agents** Special powder for metal fires. Do not use water.

**For safety reasons unsuitable extinguishing agents** Water

**Special hazards arising from the substance or mixture**

In case of fire, the following can be released:

Metal oxide fume

**Advice for firefighters****Protective equipment:**

Wear self-contained respirator.

Wear fully protective impervious suit.

**6 Accidental release measures****Personal precautions, protective equipment and emergency procedures**

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

Keep away from ignition sources

**Environmental precautions:**

Do not allow material to be released to the environment without proper governmental permits.

**Methods and material for containment and cleaning up:**

Ensure adequate ventilation.

Keep away from ignition sources.

**Reference to other sections**

See Section 7 for information on safe handling

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

**7 Handling and storage****Handling****Precautions for safe handling**

Keep container tightly sealed.

Store in cool, dry place in tightly closed containers.

Ensure good ventilation at the workplace.

**Information about protection against explosions and fires:**

Protect against electrostatic charges.

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**Conditions for safe storage, including any incompatibilities****Storage****Requirements to be met by storerooms and receptacles:** Store in a cool location.**Information about storage in one common storage facility:**

Aqueous solutions are incompatible with alkali and alkaline earth metals and many reactive organic and inorganic chemicals.

**Further information about storage conditions:**

Keep container tightly sealed.

Store in cool, dry conditions in well sealed containers.

**Specific end use(s)** No further relevant information available.**8 Exposure controls/personal protection****Additional information about design of technical systems:**

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

**Control parameters****Components with limit values that require monitoring at the workplace:****7440-67-7 Zirconium (70.0%)**

PEL ( )	5 mg/m <sup>3</sup> compounds, as Zr
REL ( )	Short-term value: 10 mg/m <sup>3</sup> Long-term value: 5 mg/m <sup>3</sup> compounds, as Zr (except Zirconium tetrachloride)
TLV ( )	Short-term value: 10* ** mg/m <sup>3</sup> Long-term value: 5* ** mg/m <sup>3</sup> *elemental **compounds, as Zr

**7440-58-6 Hafnium (2.0%)**

PEL ( )	0.5 mg/m <sup>3</sup> as Hf
REL ( )	0.5 mg/m <sup>3</sup> and compounds, as Hf
TLV ( )	0.5 mg/m <sup>3</sup> as Hf

**Additional information:** No data**Exposure controls****Personal protective equipment****General protective and hygienic measures**

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Maintain an ergonomically appropriate working environment.

**Breathing equipment:** Use suitable respirator when high concentrations are present.**Protection of hands:**

Impervious gloves

Check protective gloves prior to each use for their proper condition.

**Material of gloves**

The selection of suitable gloves not only depends on the material, but also on quality.

Quality will vary from manufacturer to manufacturer.

**Eye protection:** Safety glasses**Body protection:** Protective work clothing.**9 Physical and chemical properties****Information on basic physical and chemical properties****General Information****Appearance:**

<b>Form:</b>	Powder in water
<b>Color:</b>	Dark grey
<b>Odor:</b>	Odorless
<b>Odor threshold:</b>	Not determined.

<b>pH-value:</b>	Not applicable.
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**Change in condition**

<b>Melting point/Melting range:</b>	Not determined
<b>Boiling point/Boiling range:</b>	Not determined

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<b>Sublimation temperature / start:</b>	Not determined
<b>Flammability (solid, gaseous)</b>	Highly flammable.
<b>Ignition temperature:</b>	80°C (176 °F)
<b>Decomposition temperature:</b>	Not determined
<b>Auto igniting:</b>	Product is not selfigniting.
<b>Explosion limits:</b>	
Lower:	Not determined
Upper:	Not determined
<b>Vapor pressure at 20°C (68 °F):</b>	23 hPa (17 mm Hg)
<b>Density:</b>	Not determined
<b>Relative density</b>	Not determined.
<b>Vapor density</b>	Not applicable.
<b>Evaporation rate</b>	Not applicable.
<b>Solubility in / Miscibility with Water:</b>	Insoluble
<b>Segregation coefficient (n-octanol/water):</b>	Not determined.
<b>Viscosity:</b>	
dynamic:	Not applicable.
kinematic:	Not applicable.
<b>Solvent content:</b>	
Organic solvents:	0.0 %
Water:	28.0 %
<b>Solids content:</b>	70.0 %
<b>Other information</b>	No further relevant information available.

**10 Stability and reactivity****Reactivity****Chemical stability****Thermal decomposition / conditions to be avoided:**

Decomposition will not occur if used and stored according to specifications.

**Possibility of hazardous reactions**

Spontaneously flammable in air.

Reacts with alkali metals.

Reacts with alkaline earth metals.

**Incompatible materials:**

Oxidizing agents

Aqueous solutions are incompatible with alkali and alkaline earth metals and many reactive organic and inorganic chemicals.

**Hazardous decomposition products:** Metal oxide fume**11 Toxicological information****Information on toxicological effects****Acute toxicity:****Primary irritant effect:****on the skin:** May cause irritation**on the eye:** May cause irritation**Sensitization:** No sensitizing effects known.**Additional toxicological information:**

To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

ACGIH A4: Not classifiable as a human carcinogen: Inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.

The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute and/or other multiple dose toxicity data for components in this product.

**12 Ecological information****Toxicity****Aquatic toxicity:** No further relevant information available.**Persistence and degradability** No further relevant information available.**Behavior in environmental systems:****Bioaccumulative potential** No further relevant information available.

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**Mobility in soil** No further relevant information available.**Additional ecological information:****General notes:**

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

Do not allow material to be released to the environment without proper governmental permits.

**Results of PBT and vPvB assessment****PBT:** Not applicable.**vPvB:** Not applicable.**Other adverse effects** No further relevant information available.**13 Disposal considerations****Waste treatment methods****Recommendation** Consult state, local or national regulations to ensure proper disposal.**Uncleaned packagings:****Recommendation:** Disposal must be made according to official regulations.**14 Transport information****UN-Number****DOT, ADR, IMDG, IATA**

UN1358

**UN proper shipping name****DOT, IMDG, IATA****ADR**

ZIRCONIUM POWDER, WETTED

1358 ZIRCONIUM POWDER, WETTED

**Transport hazard class(es)****DOT, IMDG, IATA****Class**

4.1 Flammable solids, self-reactive substances and solid desensitised explosives.

**Label**

4.1

**ADR****Class**

4.1 (F3) Flammable solids, self-reactive substances and solid desensitised explosives

**Label**

4.1

**Packing group****DOT, ADR, IMDG, IATA**

II

**Environmental hazards:****Marine pollutant:**

No

**Special precautions for user**

Warning: Flammable solids, self-reactive substances and solid desensitised explosives

**Danger code (Kemler):**

40

**Segregation groups**

Powdered metals

**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**

Not applicable.

**UN "Model Regulation":**

UN1358, ZIRCONIUM POWDER, WETTED, 4.1, II

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**15 Regulatory information**

**Safety, health and environmental regulations/legislation specific for the substance or mixture**

**Product related hazard informations:**

**Hazard symbols:**

F Highly flammable

**Risk phrases:**

11 Highly flammable.

**Safety phrases:**

7/8 Keep container tightly closed and dry.

33 Take precautionary measures against static discharges.

**National regulations**

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

All components of this product are listed on the Canadian Domestic Substances List (DSL).

**Information about limitation of use:** For use only by technically qualified individuals.

**Other regulations, limitations and prohibitive regulations**

**REACH - Pre-registered substances**

All ingredients are listed.

**Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

**16 Other information**

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing MSDS:** Health, Safety and Environmental Department.

**Contact:**

Zachariah C. Holt

Global EHS Manager

**Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (關於國際公路運輸危險貨物的歐洲協定)

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

ICAO: International Civil Aviation Organization

HMIS: Hazardous Materials Identification System (USA)

WHMIS: Workplace Hazardous Materials Information System (Canada)

USA