

# TECHNICAL DATA SHEET

Date of Issue: 2016/09/02

## Zirconium Metal powder, Grade AB, aqueous suspension

CAS-No.	7440-67-7
EC-No.	231-176-9
Molecular Formula	Zr
Product Number	453081

### APPLICATION

Zirconium powders find application in various pyrotechnic areas. They are a source of heat for squibs and ignition devices for a variety of uses including automotive airbag inflators. For the production of highly reactive and quick fuze compositions in pyrotechnics for use in ammunition, explosives, airbags and safety belt pretensioners. They are also used in manufacture of flash cubes, electronic tubes, as well as alloying agent with other metals.

### FURTHER INGREDIENTS

Hafnium	
CAS-No.	7440-58-6
EC-No.	231-166-4

### SPECIFICATION

Zr total + Hf total	95.0 - 96.9 %
Hf	approx. 2 % (natural content)
Ignition gain	28.4 - 30.9 %
Burning rate	12.5 +/- 7.5 s/50 cm
Surface area (BET)	1.3 +/- 0.5 m <sup>2</sup> /g
Auto ignition temperature	235 +/- 65 °C
Ca	max. 0.1 %
Fe	max. 0.1 %
Al	max. 0.1 %
Mg	max. 0.5 %
H	max. 0.2 %

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Average particle size (Blaine)	1.9 +/- 0.4 $\mu\text{m}$
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Particle size (by sieving)	min. 99.9 % < 45 $\mu\text{m}$
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**Particle size distribution (laser granulometer)**

<u>particle size</u>	<u>% less than</u>
12 $\mu\text{m}$	100
7 $\mu\text{m}$	94 - 100
3 $\mu\text{m}$	75 - 94
0.75 $\mu\text{m}$	0 - 15

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**METHOD OF ANALYSIS**

Determination of ignition gain, particle size distribution, average particle size, specific surface area (BET), combustion properties, gravimetric analysis of zirconium, spectrometric determination of impurities. For specific information on our standard methods of testing see the special metals sales program.

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**PHYSICAL PROPERTIES**

Appearance	suspension
Color	black to gray
Melting point/ range	1,852 °C (Zirconium powder)
Boiling point/boiling range	3,577 °C
Density	6.5 g/cm <sup>3</sup> at 20 °C
Bulk density	1,200 - 2,300 kg/m <sup>3</sup>
Water solubility	(practically insoluble)
Additional Physical Properties	Delivery Form: packed under water

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## HANDLING & STORAGE

**Handling** Highly flammable solid. Dust explosion hazard.

An ultra-fine, high-grade zirconium powder which ignites very easily and burns extremely rapidly at white heat. Zirconium metal powder is fairly inert to most chemical reagents, but at elevated temperatures is attacked by oxidizing agents and acids. Zirconium powder is attacked by cold acid fluoride solutions. Keep away from flames, sparks and heat sources. Use ground connected metallic apparatus to avoid sudden ignition by electrostatic discharge. Self ignition is possible. Vacuum drying of suspensions is not recommended. Wear gloves, a face shield or safety goggles. In case of fire cover with dry sand or dry chemical/dolomite (powdered limestone). Never extinguish with water, carbon dioxide, or halocarbon.

See our safety data sheet and special precautionary advice for more information on safety.

**Storage** Store in tightly closed containers.

## TRANSPORT & PACKAGING

UN number 1358

ADR	Class: 4.1	PG: II	Label: 4.1
RID	Class: 4.1	PG: II	Label: 4.1
IMDG	Class: 4.1	PG: II	Label: 4.1
IATA_C	Class: 4.1	PG: II	Packing instruction (cargo aircraft): 448
IATA_P	Class: 4.1	PG: II	Packing instruction (passenger aircraft): 445

Hazard pictograms



**Signal Word** Danger

**H&P Phrases** See Safety Data Sheet

**Labelling** The labelling is according to EU-GHS classification ((EG) 1272/2008) and may vary in other countries. Please refer to the respective Safety Data Sheet for your country.

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## Packaging

As suspension in PE-bottles overpacked in tin cans. Zirconium content 0.5 kg - 5 kg, water content min. 30 % by weight.

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## OTHER INFORMATION

Further Related Documents      Safety Data Sheet

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